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COMMUNICATIVENESS OF THE ASSONANCE STYLISTIC DEVICE IN ENGLISH AND UZBEK LITERATURE TEXTS

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Abstract: This study examines the communicative role of assonance in English and Uzbek literary texts. Assonance, as the repetition of vowel sounds, enhances emotional expression, rhythm, and aesthetic effect in literature. Using comparative stylistic analysis, the research shows that English literature employs assonance mainly for subtle emotional and psychological nuance, while Uzbek literature uses it as a core expressive device influenced by oral tradition and vowel harmony. The findings confirm that assonance is a universal stylistic means that strengthens meaning, emotional impact, and communicative effectiveness across both languages.

Key words: *Assonance, stylistics, comparative linguistics, literary translation, onomatopoeic units, folklore, narratives.*

In literary studies and stylistics, sound organization plays a crucial role in shaping the communicative power of a text. One of the most important phonetic stylistic devices is assonance, which refers to the repetition of similar vowel sounds within words placed close to each other. Assonance is widely used in both English and Uzbek literature to enhance expressiveness, emotional coloring, rhythm, and aesthetic appeal. The communicative function of assonance lies in its ability to influence the reader's perception, reinforce meaning, and create emotional resonance.

This article focuses on how assonance operates as a communicative tool in English and Uzbek literary texts, highlighting similarities and differences shaped by linguistic structure, cultural traditions, and poetic norms.

Assonance is a phonetic stylistic device based on the repetition of vowel sounds without the repetition of consonants. Unlike rhyme, which usually occurs at the end of lines, assonance can appear anywhere in a line or sentence.

For example (English): *The mellow wedding bells.*

Here, the repeated short /e/ sound creates musical harmony and softness.

In Uzbek literature, assonance is closely connected with oral poetic traditions and folklore: *Ko'nglim ochiq, yo'lim oydin.*

The repeated vowel "o" contributes to clarity and emotional openness.

Communicativeness in stylistics refers to the ability of language elements to convey meaning effectively, emotionally, and aesthetically to the reader or listener. A stylistic device is communicative when it:

- enhances clarity of meaning;
- creates emotional impact;
- strengthens imagery;
- improves memorability;
- establishes author–reader interaction.

Assonance fulfills all these functions through sound repetition, making language more expressive and engaging. Assonance intensifies emotional coloring. Soft vowels often express calmness, sadness, or tenderness, while open vowels may express joy, grandeur, or intensity.

English: Long vowels such as /o:/ or /a:/ often create a solemn or lyrical mood.

Uzbek: Open vowels like *a*, *o* emphasize emotional openness and sincerity.

Assonance contributes to the musical quality of literary texts, especially poetry. This musicality improves the communicative flow of the text and makes it more appealing.

- English poetry often uses assonance to maintain rhythm in free verse.
- Uzbek poetry frequently combines assonance with alliteration and rhyme, rooted in traditional oral performance.

Assonance can emphasize key ideas or semantic fields. Repeated vowel sounds subconsciously draw attention to important words.

Example (English): *The light of the fire is a wild desire.*

The repeated /i/ sound reinforces intensity and brightness.

Example (Uzbek): *Yuragimda orzu, ko'zimda olov.*

The vowel repetition strengthens emotional imagery.

Assonance enhances the beauty of language, making texts more memorable and artistically valuable. This is particularly significant in poetry, songs, and prose with lyrical elements. In Uzbek classical poetry, assonance is often linked to *aruz* and *barmoq* poetic systems, while in English literature it supports both traditional and modern poetic forms.

English literature makes extensive use of assonance in poetry (e.g., Romantic, Modernist poetry), prose (descriptive passages), drama (monologues and dialogues)

English is rich in vowel variety, allowing subtle emotional distinctions. Writers use assonance to create mood, highlight internal conflict and enhance narrative tension.

Assonance is especially common in works aiming for lyrical intensity or psychological depth.

Uzbek literature, influenced by oral tradition, folk poetry, and classical Eastern literature, uses assonance as a core expressive device. Assonance has strong connection with national identity. It is frequently used in folk songs, epics, and lyrical poetry. Furthermore, it has clear vowel harmony due to Turkic language structure. Uzbek vowel harmony naturally supports assonance, making it a powerful communicative tool even in everyday speech.

Despite structural differences, both languages use assonance to achieve strong communicative and aesthetic effects. A comparative analysis of the stylistic device of assonance in English and Uzbek literary texts reveals both universal characteristics and language-specific features that are shaped by linguistic structure, literary tradition, and cultural context. Although assonance functions as a phonetic means of expressiveness in both languages, its communicative role differs in form, frequency, and stylistic purpose.

From a linguistic perspective, English and Uzbek belong to different language families, which directly influences the realization of assonance. English, as a Germanic language with significant Romance influence, possesses a complex and varied vowel system, including numerous diphthongs and long and short vowel distinctions. This richness allows English writers to employ assonance in a subtle and nuanced manner, often creating delicate emotional shades and psychological depth. In contrast, Uzbek is a Turkic language characterized by a more systematic vowel harmony, which naturally facilitates vowel repetition. As a result, assonance in Uzbek texts often appears more

prominently and regularly, functioning as an organic part of the language rather than an occasional stylistic choice.

Culturally, the role of assonance in English literature is largely aesthetic and stylistic. English authors tend to use assonance to support imagery, enhance rhythm, and intensify mood, especially in lyrical poetry and descriptive prose. The communicative effect is frequently indirect, aiming to influence the reader subconsciously through sound symbolism. In Uzbek literature, however, assonance has a stronger emotional and communicative orientation. Rooted in oral traditions such as folk songs, epics, and classical poetry, vowel repetition serves not only aesthetic purposes but also aids memorization, oral performance, and emotional sincerity. This reflects the historical importance of spoken literature in Uzbek culture. Despite these differences, both literary traditions share common communicative goals. In both English and Uzbek texts, assonance strengthens semantic focus by drawing attention to key lexical units and thematic elements. It enhances the musicality of the text, improves coherence, and increases memorability. Moreover, in both languages, assonance serves as an effective means of establishing a closer interaction between the author and the audience by appealing to auditory perception alongside semantic understanding.

Assonance is a significant phonetic stylistic device that enhances the communicative power of literary texts in both English and Uzbek literature. Through repetition of vowel sounds, authors convey emotions, reinforce meaning, create rhythm, and establish deeper connections with readers. While English assonance often serves subtle aesthetic and psychological purposes, Uzbek assonance is deeply rooted in oral tradition and emotional expression. The comparative study of assonance reveals not only linguistic differences but also cultural and stylistic values, proving that sound is a universal yet culturally shaped tool of communication in literature.

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ЎТКИР ИНТОКСИКАЦИОН ПСИХОЗДА МИЯ ТЎҚИМАСИНИНГ МОРФОЛОГИЯСИ ВА ГИСТОКИМЁВИЙ ХУСУСИЯТЛАРИ.

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Мавзунинг долзарблиги: Психоз касаллиги бу - психиатриядаги асосий тушунчадир. Илгари барча турдаги рухий касалликлар учун шу ном берилган. Бугунги кунда бу атама галлюцинациялар, босинқирашлар, ҳақиқатни йўқотиш ёки эго бузилишлари билан тавсифланган ноаниқ белгиланган комплекс белгиларини (синдромини) тасвирлайди. Баъзи касалликларда аффектив аломатлар ҳам психозлар билан боғлиқ. Ушбу турли хил аломатлар алоҳида ёки комбинацияланган ҳолда пайдо бўлиши мумкин.

Психозлар турли касалликларда пайдо бўлиши мумкин. Касалликни аниқлаш фақат эҳтиёткорлик билан ташхис қўйиш орқалигина мумкин. Терапия касаллик ва симптомларга боғлиқ. Ўз- ўзидан шифо бўлмаса, даволаш кўпинча нейролептик моддалар амалга оширилади.

Психоз атамаси биринчи марта 1841-йилда Карл Фридрих Канстатт томонидан, сўнгра яна 1845-йилда Эрнст вон Феучтерслебен томонидан киритилган. 1846-йилда Карл Фридрих Флемминг жисмоний келиб чиқиши (соматогенез) ҳақида шундай ёзган: “Рухий касаллик ёки психоз ҳиссий орган воситачилигида руҳда илдиз отади, рухий касалликнинг кейинги сабаби тана аъзоларининг касаллигидир.

Психоз билан оғриган одамни психотик деб аташган. “Психоз” сўзи одатда психиатрияда рухий бузилиш, рухий касаллик ва ақлдан озиш атамалари билан бир қаторда 1875-йилда пайдо бўлган.

Ишнинг мақсади: ишнинг мақсади сифатида Хоразм вилояти патологик анатомия Бюросига вилоят рухий-асаб касалликлар диспансеридан олиб келанган 20 нафар мурданинг патологоанатомик ва биопсия текширувлари мақсад қилиб олинган.

Олинган натижалар: илмий изланишлар давомида патологоанатомик ва биопсия материаллари натижаларига кўра 20 нафар мурданинг ички аъзолари макропрепат ва микропрепарат килиб текширилди.

Текширишлар жараёнида миЯ тўқимасида патологик ўзгаришлар борлиги, миЯнинг атрофияси, бош миЯда миЯ катта ярим шарларида ўнг миЯга қараганда чап миЯ бироз кичрайгани кўринади.

Хулосалар: хулоса ўрнида шуни айтиш мумкинки, ўткир интоксикацион психозлар асосан беморларда, онанинг хомиладорлик пайтида стресс ҳолатига тушиши, болаликда иммун тизмига инфекцияларнинг таъсири ва унинг асоратлари, боланинг ижтимоийллашуви ва психологик ривожланиши, миЯ тузилишидаги анатомик ва функционал оғишлар, миЯга механик таъсирлар, яъни краниоцеребрал травма ёки ўсмалар, гормонлар таъсири шунингдек, турли соматик касалликлар сабаб бўлган.

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ДИАГНОСТИКА И ЛЕЧЕНИЕ ПОВРЕЖДЕНИЙ ЛАТЕРАЛЬНОГО МЕНИСКА КОЛЕННОГО

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Актуальность. Повреждения коленного сустава являются одной из наиболее частых причин утраты спортивной работоспособности и временной нетрудоспособности у спортсменов. Среди них особое клиническое значение имеют повреждения латерального мениска и энтезопатия сухожилия надколенника, которые нередко возникают в результате повторяющихся осевых и ротационных нагрузок, а также хронической микротравматизации. Сочетанное течение данных патологий значительно осложняет диагностику, удлиняет сроки лечения и реабилитации, а также повышает риск развития хронической болевой синдроматики и ранних дегенеративных изменений коленного сустава.

Цель исследования. Целью исследования явилось совершенствование диагностических подходов и оценка эффективности лечебных мероприятий при повреждениях латерального мениска коленного сустава в сочетании с энтезопатией сухожилия надколенника у спортсменов.

Материалы и методы. Исследование проведено в 2022–2024 гг. на базе Хорезмского многопрофильного медицинского центра, в отделении травматологии и ортопедии. В исследование были включены 78 спортсменов в возрасте от 18 до 35 лет, которые были распределены на три группы: первая группа — спортсмены с изолированным повреждением латерального мениска (32 спортсмена), вторая группа — спортсмены с изолированной энтезопатией сухожилия надколенника (24 спортсмена), третья группа — спортсмены с сочетанным поражением латерального мениска и энтезопатией сухожилия надколенника (22 спортсмена).

Всем пациентам проводилось комплексное клинико-инструментальное обследование, включающее анализ анамнестических данных, клинический осмотр с оценкой болевого синдрома и функционального состояния коленного сустава, рентгенографию, ультразвуковое исследование сухожилия

надколенника и магнитно-резонансную томографию коленного сустава. Интенсивность болевого синдрома оценивалась по визуально-аналоговой шкале (VAS), а функциональное состояние коленного сустава — по шкале Лисхольма.

Результаты. Результаты исследования показали, что у спортсменов с повреждением латерального мениска преобладали механические симптомы (блокирование сустава, щелчки), тогда как для энтезопатии сухожилия надколенника была характерна выраженная передняя боль в области колена. Сочетанное поражение сопровождалось более выраженным болевым синдромом и значительным снижением функциональных показателей. Применение дифференцированного лечебного подхода, включающего консервативную терапию и, при необходимости, артроскопическое хирургическое вмешательство, позволило достоверно снизить болевой синдром, улучшить функциональное состояние коленного сустава и сократить сроки возвращения спортсменов к тренировочному процессу.

Выводы. Таким образом, полученные данные подтверждают необходимость комплексного диагностического подхода и индивидуализированной тактики лечения повреждений латерального мениска коленного сустава и энтезопатии сухожилия надколенника у спортсменов. Ранняя диагностика и своевременное лечение позволяют предотвратить хронизацию патологического процесса, улучшить функциональные результаты и снизить риск развития дегенеративных изменений коленного сустава.

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Annotatsiya: Mazkur maqolada tashqi bozorda milliy kompaniyalarning raqobatbardoshligini ta’minlashga ta’sir etuvchi asosiy omillar tahlil qilinadi. Xususan, mahsulot sifati, innovatsiyalar, narx siyosati, marketing strategiyalari, eksport salohiyati hamda davlat tomonidan qo‘llab-quvvatlash mexanizmlarining o‘rni yoritib beriladi. Tadqiqot natijalari milliy kompaniyalarning xalqaro bozorlarda barqaror rivojlanishini ta’minlashga qaratilgan amaliy tavsiyalarni ishlab chiqishga xizmat qiladi.

Kalit so‘zlar: tashqi bozor, milliy kompaniyalar, raqobatbardoshlik, eksport, innovatsiya, marketing strategiyasi.

Аннотация: В статье анализируются основные факторы, обеспечивающие конкурентоспособность национальных компаний на внешнем рынке. Особое внимание уделяется качеству продукции, инновациям, ценовой политике, маркетинговым стратегиям, экспортному потенциалу и механизмам государственной поддержки. Результаты исследования способствуют разработке практических рекомендаций по повышению устойчивости национальных компаний на международных рынках.

Ключевые слова: внешний рынок, национальные компании, конкурентоспособность, экспорт, инновации, маркетинговая стратегия.

Abstract: This article examines the key factors influencing the competitiveness of national companies in foreign markets. Particular attention is paid to product quality, innovation, pricing policy, marketing strategies, export potential, and government support mechanisms. The findings of the study contribute to the development of practical recommendations aimed at ensuring the sustainable development of national companies in international markets.

Keywords: foreign market, national companies, competitiveness, export, innovation, marketing strategy.

Jahon iqtisodiyotining shiddatli globallashuvi davrida integratsion jarayonlar yanada katta ahamiyat kasb etmoqda. Chunki hozirgi zamonda jahon iqtisodiyotining integratsiyasi avvalo kapital, ishlab chiqarish, mehnat integratsiyasining uyg‘unligida

aks etadi. Jahon iqtisodiyotining globallashuvi esa tashqi bozor va milliy iqtisodiyotning tizimli integratsiyasi bilan namoyon bo'lish natijasida iqtisodiy o'sish jadallashadi, zamonaviy texnologiya va boshqaruv mexanizmlarining joriy etilishi tezlashadi. Bunday sharoitda mamlakatlar o'zaro savdo munosabatlarini rivojlantirish orqali tashqi savdoni tobora kengaytirish bilan bir qatorda turli tovar va xizmatlarning sifati, narxi yoki brendining bevosita ta'siri asosida kuchli raqobatga duch keladilar.

Mamlakatimizda ham tashqi savdo munosabatlarini rivojlantirish yo'lida keng ko'lamli ishlar amalga oshirilmoqda, jumladan makroiqtisodiy barqarorlikni mustahkamlash va yuqori iqtisodiy o'sish sur'atlarini saqlab qolish, milliy iqtisodiyotning raqobatbardoshligini oshirishga qaratilgan tadbirlarga katta ahamiyat berilmoqda. Xususan, O'zbekiston Respublikasi Prezidenti SH.Mirziyovning 2017 yil 7 fevralda tasdiqlagan "O'zbekiston Respublikasini yanada rivojlantirish bo'yicha Harakatlar strategiyasi to'g'risida"gi PF-4947-sonli farmonida strategik yo'nalishlardan biri sifatida belgilangan "Iqtisodiyotni rivojlantirish va liberallashtirishning ustuvor yo'nalishlari" ijrosini ta'minlash doirasida milliy iqtisodiyotni tashqi bozorda raqobatbardoshligini oshirishga qaratilgan bir qator amalga oshirilishi zikr etilgan vazifalar belgilangan, jumladan:

- iqtisodiyot tarmoqlari uchun samarali raqobatbardosh muhitni shakllantirish hamda mahsulot va xizmatlar bozorida monopoliyani bosqichma-bosqich kamaytirish;
- printsiplial jihatdan yangi mahsulot va texnologiya turlarini o'zlashtirish, shu asosda ichki va tashqi bozorda milliy tovarlarning raqobatbardoshligini ta'minlash;
- eksport faoliyatini liberallashtirish va soddalashtirish, eksport tarkibini va geografiyasini diversifikatsiya qilish, iqtisodiyot tarmoqlari va hududlarning eksport salohiyatini kengaytirish va safarbar etish.

Shu jihatdan olganda, milliy ishlab chiqaruvchilarning tashqi bozordagi raqobatbardoshligini ta'minlashda ichki raqobat muhitini zamonaviy talablarga mos qayta shakllantirish orqali ishlab chiqarishni texnik va texnologik yangilash va modernizatsiya qilish hal qiluvchi omil bo'lib xizmat qilishi bilan milliy iqtisodiyotga savdo, moliya, investitsiyalarni jalb qilishga intilishida ko'rinadi.

Iqtisodiyotdagi mavjud raqobat muhiti taraqqiyotning yordamchi "harakatga keltiruvchi kuch" sifatida modernizatsiyalash va texnik yangilanish jarayonlarini jadallashtiradi. Raqobat sharoitida ishlab chiqarish munosabatlari sub'ektlari o'rtasida unumliroq texnologiya, ish joyi, yaxshi bozorni qo'lga kiritish, umuman, yuqori daromad olish imkoniyati uchun kurash olib boriladi.

Ma'lumki, bozorda faoliyat yurituvchi xo'jalik sub'ektlari foyda olish maqsadida ma'lum resurslarni (moddiy, mehnat, moliyaviy, nomoddiy) qayta ishlash orqali tayyor mahsulot yoki xizmatlar ko'rinishidagi yakuniy mahsulotlarni yaratib, ularni

iste'molchilarga taklif etadilar. O'z-o'zidan ma'lumki, biror-bir turdagi mahsulotni ishlab chiqaruvchilar soni ortib borar ekan, ular o'rtasida xaridorlar uchun kurash vujudga keladi, ya'ni raqobat muhiti shakllanadi.

Shuningdek korxonalar raqobatdoshligi to'g'risida yuritilgan mulohazalar asosida quyidagi xulosaga kelish mumkin: raqobatdoshlik tushunchasi mazkur bozordamavjud bo'lgan o'xshash ob'ektlarga nisbatan muayyan ehtiyojni qondirish darajasi bilan tavsiflanadigan ob'ekt xususiyatini; mazkur bozordagi o'xshash ob'ektlarga nisbatan raqobatga dosh berish qobiliyatini; o'z mahsulotlari bilan kishilar ehtiyojini qondirish darajasi va ishlab chiqarish faoliyati samaradorligi bo'yicha korxonalar rivojlanishining boshqalardan farqini ifodalaydi.

“Eksport salohiyati” eng avvalo korxonaning tashqi bozorda raqobatdoshligini anglatadi. Ya'ni eksport salohiyati bir tomondan korxonaning raqobat salohiyatibilan uzviy bog'liqdir. Raqobat salohiyati korxonaning moddiy va nomoddiy resurslardan foydalangan holda raqobat ustunliklarini shakllantirib, bozorda samarali raqobat kurashini olib borishini ta'minlay oladigan ichki va tashqi raqobat imkoniyatlarini ifodalay ekan. Shunga asosan korxonaning eksport salohiyatini raqobat salohiyatidan foydalanish darajasi sifatida e'tirof etish mumkin (1-jadval).

1-jadval

Mahsulotlar bozorining ta'minlanganligini turli darajalarida qo'llaniladigan strategiya variantlari¹

Bozorning mahsulot bilan ta'minlanganlik darajasi/Strategiya variantlari	Tanqislik, talabning taklifdan ortiqqligi	Talab va taklif o'rtasidagi nisbiy tenglik	Takliflar bozori (taklif talabdan ortiqqligi)
Mahsulot ishlab chiqarish strategiyasi	Songa asoslangan	ifotga asoslangan	Raqobatga asoslangan
Biznesni tashkil qilishdagi yondashuvlar	Diqqat markazda ishlab chiqarish	Diqqat markazda mahsulot	Diqqat markazda iste'molchi
Mahsulotni iste'molchigachaytkazish bo'yicha faoliyat	Mahsulotni tarqatish, ta'minlash	Savdo (mahsulot ayirboshlash)	Marketing (bozor va ishlab chiqarishni tashkil etish quroli sifatida)

¹ Манба: Халилов Н.Х. Саноат корхоналарида махсулот сифати ва рақобатдошлигини оширишнинг методологик масалалари. // “Иқтисодиёт ва инновацион технологиялар” илмий электрон журнали. - 2015. - № 1, январь-февраль.

Bundan kelib chiqadiki sanoat korxonasi va ularning mahsulotlari raqobat salohiyati asosida shakllanib, tashqi bozorda raqobat ustunliklari hisobiga ularning joriy darajasi eng ko'pi bilan salohiyat darajasigacha borib y e tadi. Agarda muayyan raqobat muhitida salohiyatdan to'liq foydalangan holda korxonasi yoki uning mahsulotlari raqobatdoshligi talab darajasida bo'lmasa, eng avvalo raqobat salohiyatini oshirish va uni ro'yobga chiqarish bilan bog'liq chora-tadbirlar ishlab chiqiladi hamda amalga oshiriladi.

Demak raqobatdoshlik namoyon bo'lishining asosiy yo'nalishlaridan biri – raqobatchilarnikiga o'xshash mahsulotlarning yangi turlarini ishlab chiqarishni o'zlashtirishdir. Mahsulotlar bozorining muayyan segmentida, raqobatchilar ishtiroki qisqarishida sotuvlar hajmini kengaytirish o'zgaruvchan kon'yunkturaga moslashuvga misol bo'la oladi. Bunda moddiy resurslar sarfining qisqarishi ikki yo'nalish bo'yicha boshqaruv tizimini qayta qurish bilan erishiladi. Birinchidan, nazoratni va eng avvalo, byudjet orqali moliyaviy nazoratni takomillashtirish talab etiladi. Ikkinchidan, boshqaruvni markazdan qochirish, tashqi muhit bilan o'zaro aloqalar uchun mas'uliyatni quyi pog'onalariga o'tkazish lozim. Boshqaruvni markazdan qochirishning keng tarqalgan shakli bo'lib, iste'molchiga qaratilgan guruhlarni shakllantirish va ularga o'zini-o'zi tashkil etish uchun sharoit yaratishga xizmat qiladi.

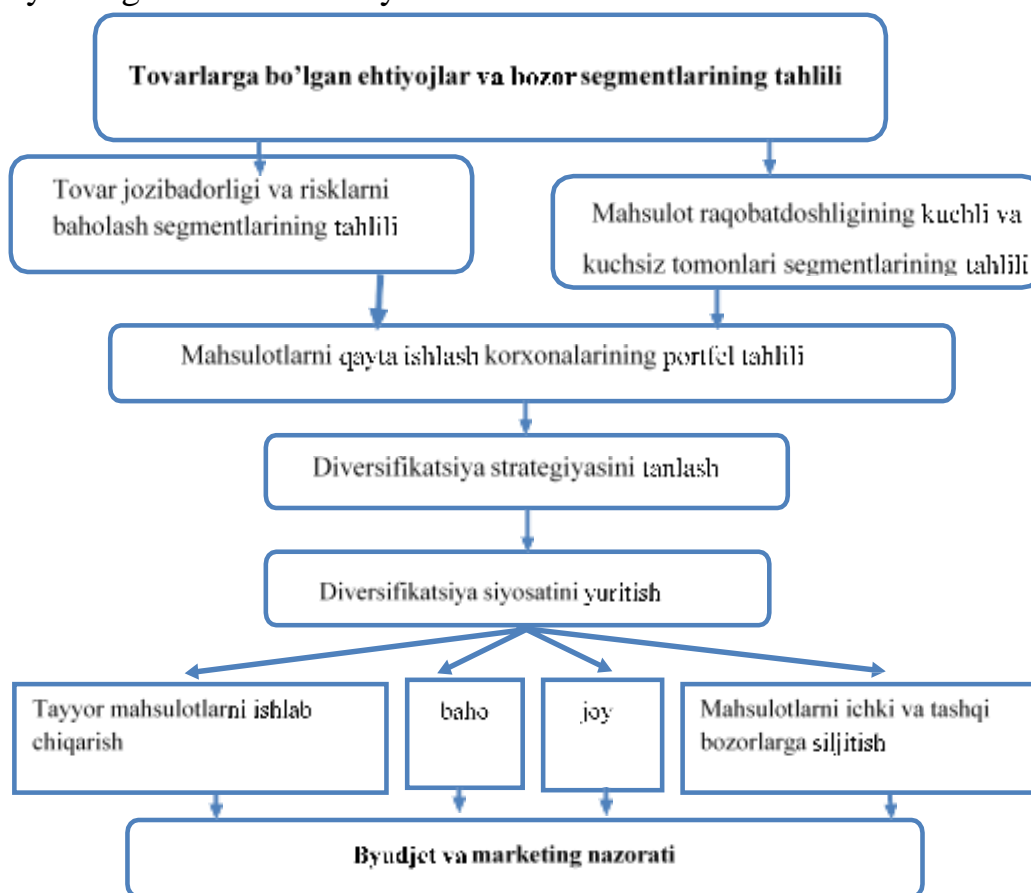
Ma'lumki, iqtisodiy terminologiyada ishlab chiqarish jarayonida yangi yo'nalishni tanlash yoki mahsulotning yangi turini yaratish bilan bog'liq jarayon diversifikatsiyalashuv sifatida talqin qilinadi. Diversifikatsiya tushunchasi lotinchadan olingan bo'lib, “diversificatio” “xilma-xil taraqqiyot” degan ma'noni bildiradi. Diversifikatsiya so'ziga hozirgi kunda umumiy tarzda quyidagicha ta'rif beriladi. Diversifikatsiya korxonasi (birlashma)larning faoliyat sohalari va ishlab chiqarilgan mahsulotlari turlarining kengayishi yangilanib turishidir. Diversifikatsiya – bir-biri bilan texnologik jihatdan bog'liq bo'lmagan ishlab chiqarish turlarini bir vaqtda rivojlanishi va mahsulot turlarining ko'payishidir. Ishlab chiqarishni diversifikatsiyalash deganda bir yoki bir necha xildagi turdosh mahsulotni ishlab chiqarishga tayangan ishlab chiqarish tuzilmasidan, keng turdagi, bir necha yo'nalishni o'z ichiga olgan ishlab chiqarish tuzilmasiga o'tishni tushunish mumkin. Diversifikatsiyalashuv bir necha bosqichda amalga oshirilib, dastlab tarmoq doirasida ishlab chiqarishning ayrim tarmoqlarga ajralishi sifatida yuz berishi, so'ngra tarmoqning o'zida korxonalarining shakllanishi hamda ixtisoslashuvning yuzaga kelishi hisoblanadi.

Shunday ekan, diversifikatsiya korxonasi strategiyasini o'zgartirish va unga erishishning asosiy vositalaridan biri bo'lib yuzaga chiqadi.

Tadqiqotlarga ko'ra, zamonaviy diversifikatsiya siyosati yangi mahsulotlar, uskunalar, xizmatlar va yangi texnologiyalarni ishlab chiqish hamda ularni bozorda sotish uchun yangi marketing usullaridan foydalanish bilan bog'liq bo'lib, iste'molchilar talabini to'liq qondirish hamda yangi bozorlarni egallashimkoniyatini beradi.

Diversifikatsiya siyosatining natijadorligini samara keltiruvchi mahsulotlar, xizmatlar va jarayonlarda turli darajadagi o'zgarishlarda kuzatish mumkin. O'rganishlar shuni ko'rsatadiki, texnologiyaning rivojlanishi yangicha boshqaruv hamda marketing siyosati bilan birgalikda borishi lozim. Ularga quyidagilarni keltirish mumkin:

1. Texnologik innovatsiyalarni yuritish shakllari va yangi bozorlarni egallash.
2. Iste'molchilar faolligini rag'batlantirishning yangi usullarini ishlab chiqish va kombinatsiyalashgan diversifikatsiya.



1- rasm. Qayta ishlash korxonalarida diversifikatsiya siyosatini amalga oshirishning ko'p bosqichli umumiy algoritmi

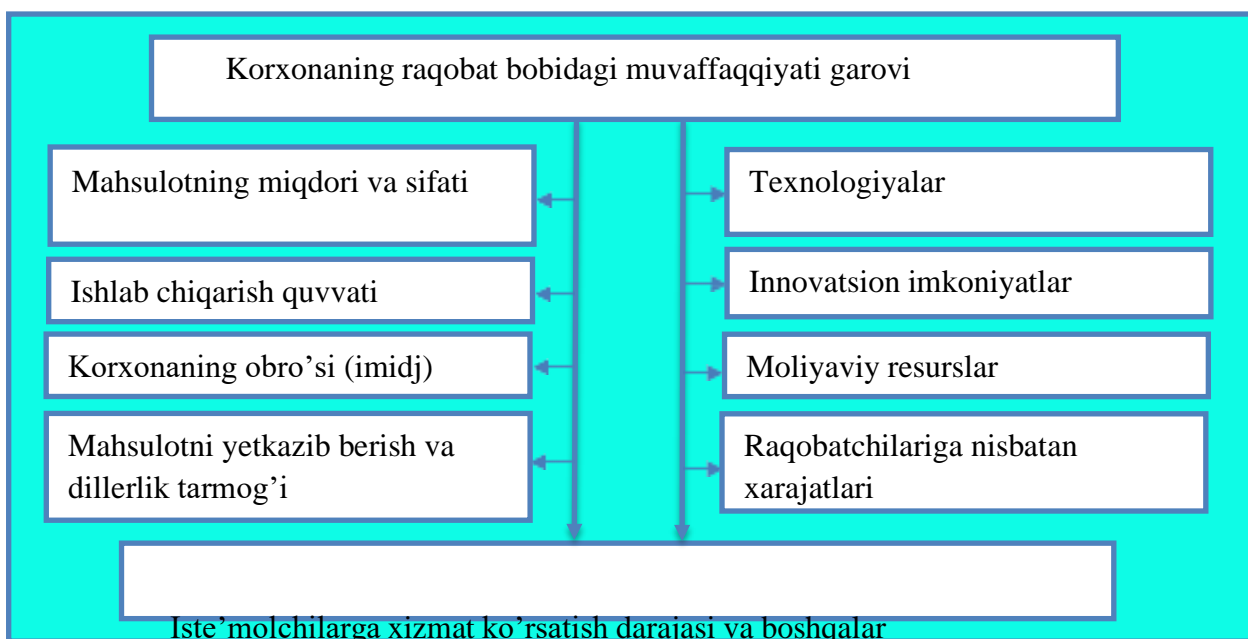
Ilmiy izlanishlar shuni ko'rsatadiki, diversifikatsiya siyosati marketing siyosati kontseptsiyasi asosida korxonaning raqobatdoshlik strategiyasini izlash hisoblanadi. Demak, tarmoq korxonalarida diversifikatsiya siyosatini boshqarishga marketing orqali

yondashilib, u asosan, ishlab chiqaruvchi hamda iste'molchi nuqtai nazaridan o'rganiladi. Diversifikatsiya siyosati o'z navbatida uning strategiyani ishlab chiqishni, bozorni tahlil qilish va marketingni o'z ichiga oluvchi bir necha bosqichlardan iboratdir (1-rasm).

Bozor muhitida faoliyat yuritayotgan korxonalarining diversifikatsiya faoliyati nazariy asoslarini tadqiq etishga bag'ishlangan ilmiy adabiyotlarni o'rganish jarayonida neftni qayta ishlash sohasida faoliyat yurituvchi xo'jalik sub'ektlarining raqobat ustunliklariga ta'sir etuvchi omillarni bir-biriga qarama-qarshi ikki yo'nalish bo'yicha tasniflashni maqsadga muvofiq deb topdik.

O'z navbatida tizimga nisbatan bunday omillarni ichki va tashqi omil sifatida ham qarash mumkin. Ushbu ikki guruh omillarining o'zaro ta'siri qanchalik bir-biriga mutanosib bo'lsa, korxonaning raqobat ustunligi kuchayadi, bir-birini inkor etsa aksincha ta'sir ko'rsatadi. M.Porter raqobatdoshlik omillarini u bilan bevosita bog'lagan holda ularni bir necha yirik guruhlarga ajratgan.

M.Porter korxonaning ichki va tashqi bozordagi raqobat ustunligi, korxonalar joylashgan mamlakatda shakllangan sharoitlarga yuqori darajada bog'liq, ya'ni ishchi kuchining mavjudligi, tabiiy resurslarining ko'pligi, davlatning mahalliy korxonalar nisbatan proteksionistik siyosati, korxonalar boshqaruv amaliyotidagi farqlar va boshqa omillarga bog'liqligini asoslab bergan. Biroq, ko'rib o'tilgan omillardan alohida olingan hech biri korxonaning raqobatdagi muvaffaqiyatini belgilab bera olmaydi, degan xulosaga keladi (2-rasm).



2- rasm. Korxonaning raqobat bobidagi muvaffaqiyati garovi²

Uning fikricha, raqobatdoshlik resurslardan foydalanish samaradorligi tamoyiliga asoslanadi va bu tamoyil korxonada darajasiga ham, mamlakat iqtisodiyoti darajasiga ham birday taalluqlidir. Artur A. Tompson va A. J. Striklendlar korxonaning raqobat bobidagi muvaffaqiyati garovi sifatida quyidagilar hal etuvchi omillar degan g'oyani ilgari suradilar:

- bir qator rossiyalik iqtisodchilar raqobat muhitidagi korxonada muvaffaqiyatining asosiy omillariga korxonaning moliyaviy holatini;
- ilmiy va tajriba-konstruktorlik ishlari uchun sharoitlarmavjudligi hamda ularga sarflanadigan xarajatlar darajasi;
- ilg'or texnologiyalarning va savdo tarmog'ining mavjudligi;
- yuqori malakali kadrlar bilan ta'minlanganlik darajasi;
- mahsulot va narxni o'zgartirish qobiliyati;
- texnik xizmat ko'rsatish holati va kreditlash imkoniyati;
- reklama va savdoni rag'batlantirish vositalarining amaliyligi;
- axborot ta'minoti va asosiy xaridorlarning to'lov qobiliyatlarini kiritadilar.

Diversifikatsiya siyosatining tarkibiy qismlaridan biri baho siyosatini to'g'ri belgilay olish raqobat ustunligini kuchaytiradi:

a) resurs tejamkorligiga erishish, ya'ni raqobatchilarga nisbatan mahsulotni ishlab chiqarish xarajatlarini kamaytirish;

b) ishlab chiqarish hajmini oshirish;

v) bir vaqtning o'zida mahsulot tannarxini pasaytirish, uning hajmi va assortimentini oshirishga erishish. Har uchchala holatda ham baho ijobiy ta'sir etuvchi hosilaviy omil bo'lib yuzaga chiqadi.

Samarali diversifikatsiya siyosatini yuritish, omillarning korxonada amaliy faoliyatida qanchalik samarali qo'llanilishiga bog'liq bo'ladi. Biroq, ushbu omillarning barchasini ham miqdoran baholab bo'lmaydi, bu esa ularni jamlanma bahosini hisoblashni murakkablashtiradi. Mavjud sharoitlarga mos bo'lgan ko'rsatkichlarni ishlab chiqishning zamonaviy uslublarini qo'llash zaruratini keltirib chiqaradi.

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BRONXIAL ASTMA KASALLIGI: ETIOLOGIYASI, PATOGENEZI VA ZAMONAVIY DAVOLASH YONDASHUVLARI

Sariosiyo Abu Ali ibni Sino
nomidagi jamoat salomatligi
texnikumi maxsus fan kafedراسي
Terapiya fani o'qituvchisi
Inoyatullayeva Shaxriniso

Annotatsiya

Mazkur maqolada bronxial astma kasalligining kelib chiqish sabablari, rivojlanish mexanizmlari, klinik belgilari, tashxislash usullari hamda zamonaviy davolash va profilaktika yo'llari ilmiy asosda yoritilgan. Bronxial astma surunkali yallig'lanishli nafas yo'llari kasalligi bo'lib, uning tarqalishi dunyo miqyosida ortib bormoqda. Maqolada kasallikni erta aniqlash, individual davolash rejalarini ishlab chiqish va bemorlarning hayot sifatini yaxshilash masalalariga alohida e'tibor qaratilgan.

Kalit so'zlar: bronxial astma, nafas yo'llari, allergiya, yallig'lanish, bronxospazm, inhalyatsion terapiya.

Аннотация

В данной статье рассматриваются этиология, патогенез, клинические проявления, методы диагностики и современные подходы к лечению бронхиальной астмы. Бронхиальная астма является хроническим воспалительным заболеванием дыхательных путей, распространённость которого во всём мире продолжает расти. Особое внимание уделено вопросам ранней диагностики, индивидуализации терапии и улучшения качества жизни пациентов.

Ключевые слова: бронхиальная астма, дыхательные пути, аллергия, воспаление, бронхоспазм, ингаляционная терапия.

Annotation

This article discusses the etiology, pathogenesis, clinical features, diagnostic methods, and modern treatment approaches of bronchial asthma. Bronchial asthma is a chronic inflammatory disease of the airways with an increasing global prevalence. Special attention is paid to early diagnosis, individualized treatment strategies, and improving patients' quality of life.

Key words: bronchial asthma, airways, allergy, inflammation, bronchospasm, inhalation therapy.

KIRISH QISMI

Bronxial astma — bu nafas yo‘llarining surunkali yallig‘lanishi bilan kechuvchi, qaytalanib turuvchi bronxospazm, nafas qisishi, yo‘tal va xirillash bilan namoyon bo‘ladigan kasallikdir. Jahon sog‘liqni saqlash tashkiloti ma‘lumotlariga ko‘ra, bronxial astma bugungi kunda global sog‘liqni saqlash muammolaridan biri hisoblanadi.

Kasallik har qanday yoshda uchrashi mumkin bo‘lib, ko‘pincha bolalik davrida boshlanadi. Bronxial astmaning dolzarbligi uning surunkali kechishi, mehnatga layoqatni pasaytirishi va hayot sifatiga salbiy ta‘siri bilan belgilanadi. Shu sababli ushbu kasallikni chuqur o‘rganish va samarali davolash muhim ahamiyat kasb etadi.

Asosiy qism

Bugungi kunda bronxial astma jahon miqyosida keng tarqalgan surunkali kasalliklardan biri hisoblanadi. Jahon sog‘liqni saqlash tashkiloti ma‘lumotlariga ko‘ra, dunyoda 300 milliondan ortiq inson bronxial astma bilan og‘rigan bo‘lib, ushbu ko‘rsatkich yil sayin ortib bormoqda. Kasallik bolalar va kattalarda uchrashi, uzoq davom etishi hamda doimiy tibbiy nazoratni talab qilishi bilan dolzarb muammolardan biri sanaladi.

Bronxial astma nafas yo‘llarining surunkali yallig‘lanishi bilan bog‘liq bo‘lib, bronxlar giperreaktivligi, qaytalanib turuvchi nafas qisishi, yo‘tal, xirillash va bo‘g‘ilish xurujlari bilan namoyon bo‘ladi. Ushbu kasallikning klinik kechishi turlicha bo‘lib, yengil shakldan og‘ir, nazorat qilinmaydigan holatlarga yetib borishi mumkin.

Bronxial astmaning ijtimoiy ahamiyati shundaki, u bemorlarning mehnat faoliyati, o‘qish jarayoni va umumiy hayot sifatiga sezilarli ta‘sir ko‘rsatadi. Shu bois mazkur kasallikni o‘rganish, erta tashxislash va samarali davolash strategiyalarini ishlab chiqish zamonaviy tibbiyotning ustuvor yo‘nalishlaridan biridir.

Bronxial astma — bu bronxlar shilliq qavatining surunkali yallig‘lanishi bilan kechuvchi, bronx lümenining qaytuvchan torayishi va nafas yo‘llarining giperreaktivligi bilan tavsiflanadigan kasallikdir.

Bronxial astma polietiologik kasallik bo‘lib, uning rivojlanishida bir nechta omillar o‘zaro ta‘sirlashadi.

Ilmiy tadqiqotlar shuni ko‘rsatadiki, bronxial astmaning rivojlanishida irsiy moyillik muhim rol o‘ynaydi. Agar ota-onalardan biri allergik kasalliklar bilan og‘rigan bo‘lsa, bolada astma rivojlanish xavfi bir necha barobar ortadi.

Havoning ifloslanishi, sanoat chiqindilari, tamaki tutuni, kimyoviy moddalarga uzoq muddat ta‘sir etish bronxial astmaning rivojlanishiga sabab bo‘ladi.

Kasallikning patogenezida bronx shilliq qavatida surunkali yallig‘lanish jarayoni asosiy o‘rin tutadi. Yallig‘lanish mediatorlari (gistamin, leyukotrienlar,

prostaglandinlar) ajralib chiqishi natijasida bronx mushaklarining spazmi yuzaga keladi.

Bronxial astma — bu murakkab, surunkali va ko‘p omilli kasallik bo‘lib, uni samarali boshqarish uchun erta tashxis, individual davolash va doimiy tibbiy nazorat zarur. Zamonaviy davolash usullari yordamida bemorlarning hayot sifatini sezilarli darajada yaxshilash mumkin.

Bronxial astmaning etiologiyasi. Bronxial astmaning rivojlanishida bir qator omillar muhim rol o‘ynaydi. Ular quyidagilardan iborat:

Genetik moyillik – irsiy allergik kasalliklar mavjudligi;

Allergenlar – uy changi, gul changi, hayvon tuklari, oziq-ovqat allergenlari;

Atrof-muhit omillari – havoning ifloslanishi, kimyoviy moddalar;

Infeksiyalar – virusli respirator kasalliklar;

Psixosotsional stress va jismoniy zo‘riqish.

Patogenez mexanizmlari. Bronxial astmaning asosiy patogenetik mexanizmi — bronx shilliq qavatining surunkali yallig‘lanishidir. Yallig‘lanish natijasida bronx devorida shish, shilliq ajralishining ko‘payishi va bronx mushaklarining qisqarishi yuz beradi.

Bu holat bronx lümenining torayishiga va nafas olishning qiyinlashishiga olib keladi. Klinik belgilari-Kasallik quyidagi asosiy belgilar bilan namoyon bo‘ladi: Nafas qisishi (ayniqsa tunda va ertalab); Xirillash; Quruq yoki balg‘amli yo‘tal; Ko‘krak qafasida siqilish hissi.

Diagnostika usullari. Bronxial astmani aniqlashda quyidagi usullar qo‘llaniladi:

Anamnez va klinik tekshiruv;

Spirometriya;

Pikfloumetriya;

Allergologik testlar;

Laborator tekshiruvlar.

Davolash va profilaktikaning asosiy talablari quidagilardan iborat. Davolashning asosiy maqsadi kasallikni nazorat qilish va xurujlarni oldini olishdan iborat. Asosiy davolash usullari: Inhalyatsion glyukokortikosteroidlar; Bronxolitik preparatlar; Antigistamin dorilar; Bemorni o‘qitish va turmush tarzini sog‘lomlashtirish.

Profilaktika choralariga allergenlardan saqlanish, sog‘lom turmush tarziga rioya qilish va muntazam tibbiy nazorat kiradi.

Xulosa

Xulosa qilib aytganda, bronxial astma murakkab va ko‘p omilli kasallik bo‘lib, uni samarali boshqarish uchun erta tashxis, individual yondashuv va kompleks davolash

muhim ahamiyatga ega. Zamonaviy tibbiyot yutuqlari yordamida bronxial astma bilan ogʻrigan bemorlarning hayot sifatini sezilarli darajada yaxshilash mumkin.

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OROL BO'YI HUDUDIDA YASHOVCHI ERTA YOSHDAGI BOLALARDA SHIFOXONADAN TASHQARI ZOTILJAMNING KECHISHIGA TEMIR TANQISLIGI ANEMIYASINING TA'SIRI (ADABIYOTLAR SHARHI)

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Mavzuning dolzarbligi. Hozirgi kunda aholining ekologik salomatligini muhofaza qilish jahon miqyosidagi dolzarb masalalardan biri hisoblanadi. Orol dengizining qurishi, undagi suvning keskin darajada kamayib ketishi natijasida, uning atrofidagi xududlarda nisbatan yomon ekologik vaziyat yuzaga keldi. Jahon sog'liqni saqlash tashkiloti (JSST, 2023) ma'lumotlariga ko'ra, har yili dunyo bo'yicha 5 yoshgacha bo'lgan taxminan 150 million bola pnevmoniya bilan kasallanadi, ularning 740 ming nafari hayotdan ko'z yumadi. Bu yosh toifasidagi barcha o'lim holatlarining 14 foizini tashkil etadi. Ayniqsa, rivojlanayotgan davlatlarda pnevmoniyaning insidensi (kasallanish chastotasi) yuqori bo'lib, har 1000 bolaga 40–60 holat to'g'ri keladi.

Ishning maqsadi: Xorazm viloyatida yashovchi bolalarda temir tanqslilik anemiya kasalligi fonida o'tkir zotiljam bo'lgan bolalarda kasallikni kasallikni kechishi xususiyatlarini nashrlar tahlil qilish asosida o'rganish.

Tadqiqot natijalari: Orolbo'yi hududida olib borilgan ilmiy kuzatuvlarga ko'ra (Urganch Tibbiyot Akademiyasi, 2022), 1 yoshdan 5 yoshgacha bo'lgan bolalarda temir tanqisligi anemiyasi (TTA) 65–80% gacha uchraydi, bu esa O'zbekistonning boshqa hududlaridagi ko'rsatkichdan deyarli ikki baravar yuqori. Temir tanqisligi anemiyasi bolalar organizmidagi immun javobni susaytiradi, nafas yo'llari infeksiyalariga nisbatan himoya mexanizmlarini zaiflashtiradi va pnevmoniya rivojlanishiga zamin yaratadi.

Temir etishmovchiligi fagotsitar hujayralarning faolligini kamaytiradi, limfotsitlar proliferatsiyasini to'xtatadi, oksidlovchi stress mexanizmlarini buzadi va T-limfotsitlar faolligini pasaytiradi. Natijada bola bakterial va virusli infeksiyalarga nisbatan sezuvchan bo'lib qoladi. O'zbekiston miqyosida ham so'nggi yillarda pediatrik gematologiya va infeksiyon kasalliklar bo'yicha olib borilgan tadqiqotlar (A. Karimova, T. Abdurahmonov, Sh. Raximov, 2022) temir tanqisligi bo'lgan bolalarda pnevmoniya

nafaqat tez-tez takrorlanishi, balki og'irroq kechishini ham ko'rsatdi. Ushbu muammo ayniqsa Orolbo'yi zonasida dolzarb bo'lib, bu yerda ekologik yuklama, ovqatlanishdagi mikronutrient yetishmovchiligi va immunitetning pasayganligi birgalikda pnevmoniya kechishiga salbiy ta'sir ko'rsatmoqda.

Xulosa: sifatida aytish mumkin, Orolbo'yi hududida yashovchi erta yoshdagi bolalarda temir tanqisligi anemiyasi zotiljamning og'ir kechishiga sezilarli ta'sir ko'rsatadi. Shu bois, pediatriya amaliyotida anemiyani erta aniqlash va davolash orqali bolalarda nafas yo'llari infeksiyalarining og'ir asoratlarini kamaytirish mumkin.

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THE ETIOLOGY, PREVENTION, AND MODERN APPROACHES TO THE TREATMENT OF DENTAL CARIES

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Abstract

Dental caries remains one of the most widespread chronic diseases affecting people of all ages worldwide. Despite significant advances in preventive dentistry and restorative techniques, caries continues to pose a major public health challenge due to its multifactorial nature and close association with lifestyle, socioeconomic factors, and oral hygiene practices. This scientific article aims to analyze the etiology, pathogenesis, risk factors, preventive strategies, and modern approaches to the diagnosis and treatment of dental caries. Special attention is given to contemporary preventive measures, including fluoride use, dietary control, and patient education. The article emphasizes the importance of early diagnosis and integrated prevention programs in reducing the global burden of dental caries.

Keywords

Dental caries, oral health, prevention, fluoride, tooth decay, cariogenic bacteria

Relevance of the Topic

The relevance of dental caries as a research topic is determined by its high prevalence, impact on quality of life, and economic burden on healthcare systems. According to the World Health Organization, dental caries affects nearly 2.3 billion people worldwide, making it one of the most common non-communicable diseases. Untreated caries can lead to pain, infection, tooth loss, and systemic complications. In developing and developed countries alike, caries prevalence remains high, particularly among children and adolescents. Therefore, studying dental caries, its causes, and effective prevention and treatment strategies is essential for improving public health outcomes and promoting lifelong oral health.

INTRODUCTION

Dental caries is a chronic, progressive disease characterized by the demineralization of hard dental tissues caused by organic acids produced by bacterial fermentation of dietary carbohydrates. It is a dynamic process involving the interaction of host factors (teeth and saliva), microorganisms, diet, and time. Although caries is largely preventable, it continues to affect individuals across all age groups. Understanding the

biological mechanisms and risk factors associated with dental caries is fundamental for developing effective preventive and therapeutic interventions.

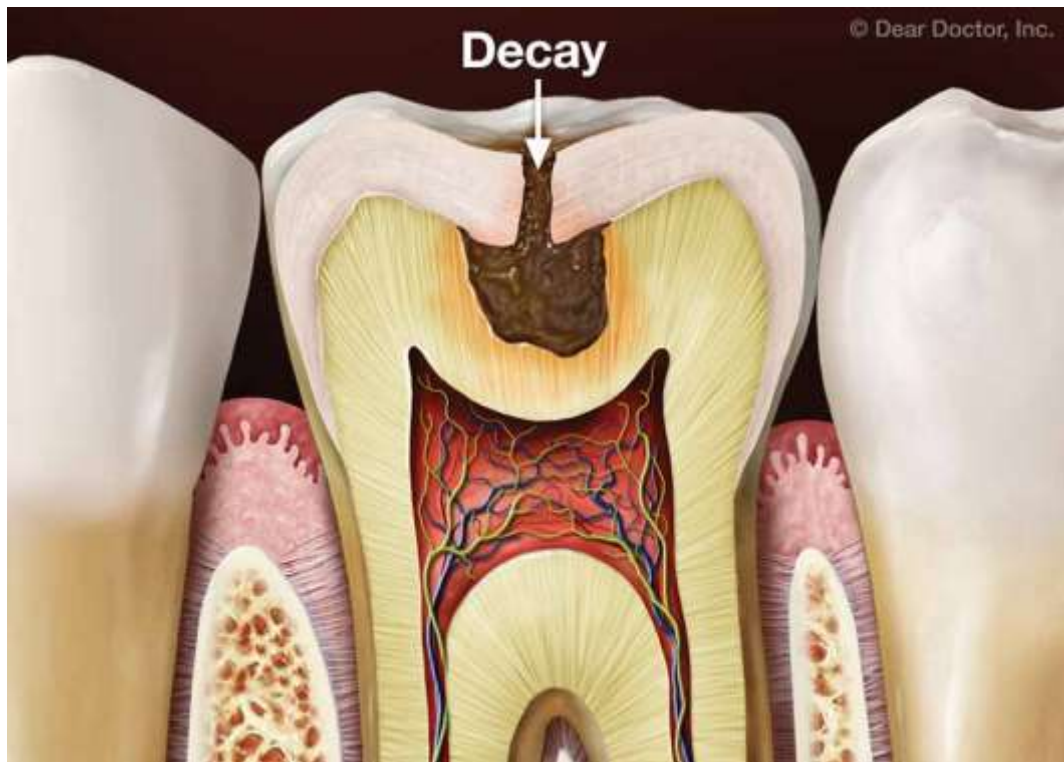


Main Part

Etiology and Pathogenesis of Dental Caries

The development of dental caries is primarily associated with the activity of cariogenic microorganisms, particularly *Streptococcus mutans*, *Streptococcus sobrinus*, and *Lactobacillus* species. These bacteria adhere to the tooth surface and form dental plaque, a complex biofilm that provides a favorable environment for acid production. When fermentable carbohydrates such as sucrose, glucose, and fructose are consumed, these microorganisms metabolize them and produce organic acids, mainly lactic acid. As a result, the pH within dental plaque decreases. When the pH drops below the critical threshold of approximately 5.5, the enamel begins to lose calcium and phosphate ions, leading to demineralization. If the demineralization process exceeds the natural remineralization capacity of saliva and fluoride, structural damage to enamel and dentin occurs, eventually forming a carious lesion.

Saliva plays a crucial protective role in maintaining oral health. It acts as a buffering system, neutralizing acids, supplying minerals necessary for remineralization, and washing away food debris and microorganisms. Conditions that reduce salivary flow, such as dehydration, medication use, or systemic diseases, significantly increase susceptibility to dental caries.



Epidemiology of Dental Caries

Dental caries affects individuals of all ages and remains a global public health concern. Epidemiological studies indicate that caries prevalence is particularly high among children, adolescents, and elderly populations. In many low- and middle-income countries, limited access to preventive dental services contributes to a higher incidence of untreated caries.

Socioeconomic factors play a significant role in the distribution of dental caries. Populations with lower income and education levels often experience higher caries rates due to inadequate oral hygiene practices, limited fluoride exposure, and poor dietary habits. Urbanization and increased consumption of processed foods rich in sugars have further exacerbated the problem worldwide.



Risk Factors

Dental caries is a multifactorial disease influenced by biological, behavioral, and environmental factors. The most significant risk factors include:

- Inadequate oral hygiene and irregular tooth brushing
- Frequent intake of sugary snacks and beverages
- Insufficient fluoride exposure
- Reduced salivary secretion (xerostomia)
- Poor socioeconomic conditions
- Limited access to dental care services
- Lack of awareness regarding oral health

Children with improper feeding practices and elderly individuals with systemic diseases or prosthetic appliances are especially vulnerable to caries development.

Prevention of Dental Caries

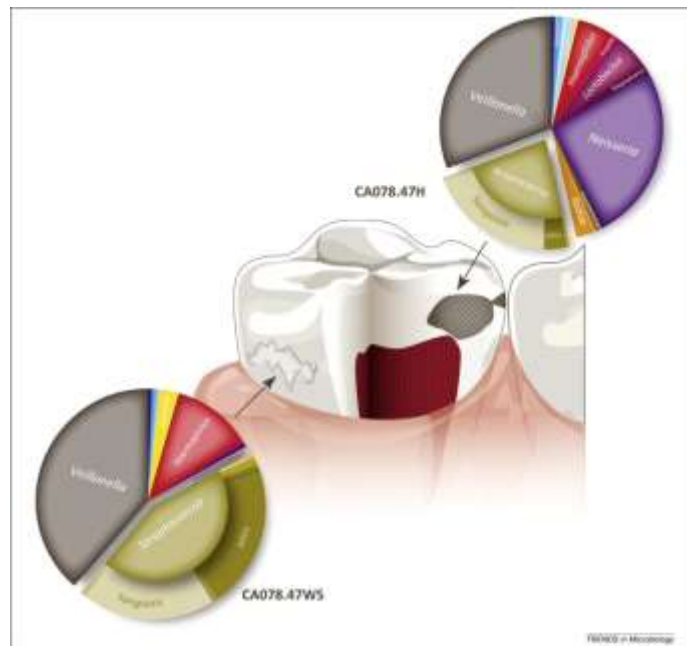
Preventive dentistry plays a central role in controlling dental caries. Effective prevention relies on a combination of individual and community-based measures. Daily tooth brushing with fluoride toothpaste is considered the most effective and accessible method of preventing caries. Fluoride enhances enamel resistance by promoting remineralization and inhibiting bacterial metabolism.

Professional preventive measures include topical fluoride applications, fissure sealants, and regular dental examinations. Dietary counseling aimed at reducing the frequency of sugar consumption is equally important. Public health strategies such as water fluoridation and school-based oral health programs have demonstrated significant success in reducing caries prevalence.



Modern Diagnostic Methods

Early detection of dental caries is essential for preventing disease progression. Traditional diagnostic methods include visual-tactile examination and radiographic imaging. However, modern dentistry increasingly relies on advanced technologies such as laser fluorescence devices, digital radiography, and optical caries detection systems. These methods allow clinicians to identify early non-cavitated lesions, enabling timely implementation of non-invasive remineralization therapies.



Modern Approaches to Treatment

The treatment of dental caries depends on the stage and severity of the lesion. Initial carious lesions can be managed using non-invasive approaches, including fluoride therapy, calcium-phosphate products, and behavioral modification.

Minimally invasive dentistry emphasizes selective removal of infected tissue while preserving healthy tooth structure. In cases of advanced caries, restorative procedures such as composite fillings, crowns, and endodontic treatment may be required. Recent advances, including laser-assisted caries removal and bioactive restorative materials, have improved clinical outcomes and patient satisfaction.

Conclusion

Dental caries remains a significant global health problem despite advances in dental science. Its multifactorial nature requires a comprehensive approach combining prevention, early diagnosis, and effective treatment. Emphasis on oral health education, preventive care, and minimally invasive treatment strategies can significantly reduce the prevalence and consequences of dental caries. Continued research and public health initiatives are essential to promote sustainable improvements in oral health worldwide.

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СИЛ КАСАЛЛИГИНИНГ ХАР ХИЛ ШАКЛЛАРИДАН КЕЛИБ ЧИҚҚАН КАСАЛЛИКЛАРДА ЮРАКНИНГ МОРФОЛОГИЯСИ.

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Мавзунинг долзарблиги: Сил касаллиги — бу ҳаво-томчи инфекцияси бўлиб, у кўпинча ўпкага зиён етказди, лекин бошқа органлар: суяклар, тери, ичакка ва юракга ҳам “ҳужум” қилиши мумкин. Касалликнинг юзага келишига *Mycobacterium tuberculosis* бактериялари сабабчидир. Улар муайян соҳаларда яллиғланишни келтириб чиқаради, натижада тўқималарда тугунлар ва некроз ўчоқлари (яъни ўлик тўқималар) ҳосил бўлади. Улар туфайли органлар нормал ишлай олмайди, организм эса умумий интоксикация билан жавоб қайтаради. Агар иммунитет ёки дори-дармонлар касалликни вақтида тўхтатмаса, инсон ҳаётдан кўз юмиши ҳам мумкин. Жаҳон соғлиқни сақлаш ташкилоти маълумотларига кўра, сил касаллиги бутун дунёда кенг тарқалган ўлим сабаблари ўнлигига киради.

Инфекциянинг асосий ўчоғи — бемор кишилар. Шундай бўлса-да, касалликнинг жониворлардан юқиш эҳтимоли ҳам мавжуд.

Атрофда касаллар қанча кўп бўлса, инфекцияни юқтириш хавфи шунча юқори бўлади. Йирик шаҳарларда жамоат жойларида бундай беморларга тўқнаш келиш ҳеч гап эмас.

Беморларнинг аксариятида касалликнинг ёпиқ шакли учрайди, яъни бактериялар организмни кемириб боради, лекин атроф-муҳитга ажралмайди.

Силнинг очик шакли эса атрофдагилар учун (беморларнинг ўзи учун ҳам) жуда хавfli ҳисобланади, шунинг учун уни шифохонада даволаш зарур. Силнинг очик шаклидан азият чекувчи кишилар билан узок вақт мулоқотда бўлиш - катта хавф.

Ишнинг мақсади: ишнинг мақсади сифатида Республика фтизиатрия ва пульмонология илмий-амалий тиббиёт маркази Хоразм филиалида сил

касаллигининг хар хил шакллари билан вафот этган беморларинг ички аъзоларидан юракдаги морфологик ўзгаришларни аниқлаш мақсад қилиб олинган.

Олинган натижалар: илмий изланишлар натижасида сил касаллигининг хар хил турдаги шакллари билан оғриган беморларнинг мурдалалари Хоразм вилояти патологик анатомия Бюросида аутопсия қилиб кўрилганда ички аъзолардан юрак тўқимасида морфологик ўзгаришлар борлиги аниқланди. Бунинг натижасида беморларда асорат сифатида ўткир-юрак етишмовчилиги содир бўлганлиги аниқланди.

Хулосалар: хулоса ўрнида шуни айтиш мумкинки, Хоразм вилоятида сил касаллигининг хар хил турдаги шаклларида вафот этган беморларнинг мурдалари аутопсия қилиб текширилганда, уларнинг ички аъзоларида яъни, юракда морфологик ўзгаришлар борлиги аниқланди. Бунинг натижасида кўпчилик беморлар касалликларининг асорати сифатида ўткир-юрак етмишмовчилиги натижасида вафот этганликлари аниқланди.

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OPTIMIZATION OF PREVENTIVE MEASURES FOR LATE COMPLICATIONS OF CHOLECYSTECTOMY IN BARIATRIC SURGERY

Jumanazarova Mokhinur Jumanazar kizi

INTRODUCTION

Obesity is currently considered one of the most significant chronic noncommunicable diseases, exerting a systemic impact on morbidity, mortality, and the economic burden on healthcare systems. According to international epidemiological observations, the prevalence of obesity continues to rise steadily in both economically developed countries and resource-poor regions, accompanied by an increase in the number of patients with severe metabolic and surgical complications.

Materials and methods

To achieve the stated goal and address the study objectives, clinical, clinical-surgical, instrumental, laboratory, and statistical research methods will be used. Clinical and clinical-surgical methods will include analysis of anamnestic data, assessment of comorbidities, characterization of the postoperative period, and analysis of the characteristics of simultaneous surgical interventions. Instrumental methods will be used to verify late complications of cholecystectomy and assess the condition of the biliary system in the late postoperative period. Laboratory methods will be used to evaluate biochemical parameters reflecting the functional state of the hepatobiliary system over time after surgery.

Results and discussions

Based on the data obtained, clinical and surgical criteria for predicting late complications of cholecystectomy in patients undergoing simultaneous bariatric surgery will be developed.

A differentiated approach to postoperative care for patients with calculous cholecystitis and morbid obesity, based on risk stratification for late complications, will be substantiated.

Implementation of the developed prognostic criteria in clinical practice will optimize postoperative monitoring, promptly identify high-risk groups, and improve the long-term effectiveness of bariatric surgery.

Conclusion

This study will clarify the structure and incidence of late complications of cholecystectomy in patients with calculous cholecystitis undergoing simultaneous bariatric surgery in the late postoperative period.

Clinical, surgical, intraoperative, and early postoperative factors associated with the risk of late complications of cholecystectomy in the context of combined surgical treatment of obesity and cholelithiasis will be identified.

Prognostic criteria for the risk of late complications of cholecystectomy during simultaneous bariatric surgery will be developed, allowing for patient stratification according to surgical risk in the late postoperative period.

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РОЛЬ НЕЙРОСПЕЦИФИЧЕСКОЙ ЭНОЛАЗЫ ПРИ ГИПЕРБИЛИРУБИНЕМИИ У НОВОРОЖДЕННЫХ ДЕТЕЙ

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Актуальность. Нейроспецифическая энолаза (НСЭ) - внутриклеточный фермент центральной нервной системы, единственный общий маркер всех дифференцированных нейронов. По его уровню можно судить о нарушениях общей целостности гематоэнцефалического барьера, что характеризует степень билирубинового повреждения мозга.

Материалы и методы. Для решения поставленных цели обследовано 155 новорожденных.

1 –основная группа - 115 младенцев с затяжной неконъюгированной гипербилирубинемией со сроком гестации $38,5 \pm 0,4$ нед., массой тела при рождении - $3797,1 \pm 250,1$ гр., длиной тела - $54,4 \pm 1,7$ см; 2 группа сравнения - 40 с физиологической желтухой сроком гестации $38,5 \pm 0,09$ нед., с массой тела при рождении - $3116,0 \pm 150,2$ гр., длиной тела - $52,3 \pm 1,0$ см; Контрольную группу составили 20 практически здоровых доношенных новорожденных без желтухи, со сроком гестации - $38,9 \pm 4,6$ нед., с массой тела при рождении $3120 \pm 156,6$ гр, длиной тела - $52,4 \pm 4,2$ см. Все дети были вакцинированы против гепатита В.

Результаты. Более высокие показатели НСЭ зарегистрированы у детей основной группы, имевших высокий уровень непрямой фракции билирубина в крови. В исследуемой группе детей с затяжной гипербилирубинемией отмечено высокое содержание НСЭ, которое было достоверно выше показателя сравниваемой группы ($p < 0,05$). У 92 (80%) младенцев с затяжной желтухой регистрировалось снижение значений НСЭ к 1 месяцу жизни в 1,7 раза по сравнению с показателем на 14 сутки жизни. Это может свидетельствовать о снижении деструктивных процессов нейронов и улучшению клинических проявлений в возрасте одного месяца. У 34 (30%) младенцев показатели НСЭ имеют тенденцию к снижению, но остаются повышенными в 1,4 раз по сравнению с показателями детей с физиологической желтухой, и достоверно превышали аналогичные данные группы контроля ($p < 0,001$).

Заключение. Данная особенность подтверждает подверженность гематоэнцефалического барьера действию различных повреждающих факторов - гипоксии, инфекции, в том числе и токсическому действию непрямого

билирубина. Анализируя колебания концентрации НСЭ в зависимости от выраженности гипербилирубинемии появляется возможность судить о структурных нарушениях мозга. Несомненный интерес представляет изучение взаимосвязи показателя НСЭ, выраженность гипербилирубинемии новорожденных и степени тяжести поражения ЦНС. Обнаружено что, статистически значимая высокая концентрация сывороточной НСЭ, подтверждает более тяжелую неврологическую патологию у этих детей.

ВЛИЯНИЕ ПРОБИОТИКОВ НА УРОВЕНЬ ЗОНУЛИНА И СОСТАВ КИШЕЧНОЙ МИКРОБИОТЫ ПРИ ФУНКЦИОНАЛЬНЫХ ГАСТРОИНТЕСТИНАЛЬНЫХ РАССТРОЙСТВАХ

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Актуальность. Функциональные гастроинтестинальные расстройства (ФГИР) занимают одно из ведущих мест в структуре заболеваний, наблюдаемых в отделениях гастроэнтерологии, и сопровождаются стойкими клиническими симптомами при отсутствии органической патологии. Современные исследования указывают на важную роль повышенной кишечной проницаемости и дисбиоза кишечной микробиоты в патогенезе ФГИР. Зонулин рассматривается как информативный биомаркер нарушения барьерной функции кишечника, что обосновывает поиск эффективных методов его коррекции

Цель исследования. Оценить влияние пробиотической терапии на уровень сывороточного зонулина, состав кишечной микробиоты и клинические проявления у пациентов с функциональными гастроинтестинальными расстройствами, проходивших лечение в отделе гастроэнтерологии.

Материалы и методы. В проспективное исследование включено 85 пациентов в возрасте 18–55 лет с диагнозом ФГИР, установленным по критериям Rome IV. Пациенты были распределены на группы: больные, получавшие стандартную симптоматическую терапию, и пациенты, получавшие стандартное лечение в сочетании с пробиотиками; контрольную группу составили практически здоровые лица. Проводились клиническая оценка симптомов, определение уровня сывороточного зонулина методом ИФА и анализ кишечной микробиоты по данным копрологического и бактериологического исследования. Продолжительность пробиотической терапии составила 8 недель.

Результаты. У пациентов с ФГИР выявлено достоверное повышение уровня зонулина и выраженные признаки кишечного дисбиоза по сравнению с контрольной группой. Назначение пробиотиков способствовало значительному снижению уровня зонулина, нормализации состава кишечной микробиоты за счёт увеличения количества *Lactobacillus* и *Bifidobacterium*, а также более выраженному уменьшению болевого синдрома, метеоризма и нарушений стула по сравнению с пациентами, получавшими только стандартную терапию.

Выводы. Функциональные гастроинтестинальные расстройства ассоциированы с повышенной кишечной проницаемостью и нарушением микробиоты кишечника. Пробиотическая терапия в условиях отделения гастроэнтерологии эффективно снижает уровень зонулина, способствует восстановлению микробного баланса и улучшению клинического состояния пациентов, что позволяет рекомендовать её как важный компонент комплексного лечения ФГИР.

THE POSSIBILITIES OF MODERN ULTRASOUND IN THE DIAGNOSIS OF ECTOPIC PREGNANCY OF VARIOUS LOCALIZATIONS

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Abstract. Timely diagnosis of ovarian pregnancy often allows for organ-preserving surgical treatment. In our experience, 4 of 7 cases of ovarian ulcer required only ovarian resection, preserving all reproductive organs. In the remaining 3 cases, adnexectomy was necessary due to significant necrotic changes in the adnexa due to late diagnosis and total hemorrhagic ovarian imbibition.

Keywords: ultrasound, ovarian pregnancy, ectopic pregnancy, gynecological emergencies.

Relevance. According to H.J. Choi et al. [1,6, 9,10,11,12], PU accounted for 1.59% of all cases of ovarian pregnancy, and J.S. We et al. [7] – 2.6%. The incidence of ovarian pregnancy is extremely low, accounting for 0.0025–0.015% of all pregnancies (1/7000–1/40000) and 0.4–3.0% of all types of ovarian pregnancy [1,2,3,4,5]. However, given that PU is a very rare pathology, and given the similarity of clinical manifestations in urgent situations with impaired ovarian tuberculosis, ovarian apoplexy, etc., one cannot but agree with the opinion that the true incidence of PU is somewhat underestimated [8,13,14,15]. When an ultrasound technician performs an examination of a patient with an ectopic pregnancy (EP), the woman should not leave the office without an appropriate diagnosis or at least a strong suspicion of one. This should be reflected in the examination protocol. Although there are many possible EP localizations, 95–98% of cases involve tubal pregnancy (TP), the clinical [1,16,17] and ultrasound [2,18,19] signs of which are well known, and significant diagnostic difficulties are rare. An experienced clinician, especially one working in an emergency room, will also not waste much time in making a diagnosis of TP. The situation can be quite different with rare forms of EP, particularly ulcerative colitis. In the mild, latent stage, the disease may go unrecognized due to symptoms uncharacteristic of TP, and rupture of the fetal sac can quickly lead to life-threatening hemorrhagic shock. At the same time, timely diagnosis of PUD allows for the use of a completely organ-preserving tactic – ovarian resection, without ovario- or adnexectomy [3].

The only relative risk factor for PUD recognized by most authors is the use of an intrauterine contraceptive device (IUD) [5, 10, 12, 13]. According to A. Tinelli et al. [14], 68% of women with PUD had an IUD. At the same time, H. Itoh et al. [15] note

that none of the 4 patients with PUD they examined had an IUD. However, N. Shan et al. [16] note in a recent study that, in addition to IUD, PUD can still be associated with a history of pelvic inflammatory disease. Some authors even believe that when diagnosing PU, it is sometimes fair not to take into account the presence or absence of risk factors [1,17] (let us agree that here an analogy with prenatal diagnosis of congenital malformations suggests itself).

Progressive peptic ulcer disease (PUD) is extremely rare and even less frequently described. For many years, virtually the only domestic, and perhaps even global, description of successful ultrasound diagnosis of progressive PU was by A.E. Volkov et al. (1993) [19].

We believe that, provided all of the above criteria are met, there is a guarantee of avoiding the situation of a late-detected pregnancy of unknown location. The above highlighted several key points: ultrasound diagnosis of PUD is often difficult due to the ambiguity of the ultrasound image, while timely detection of PUD is of significant clinical importance as a factor in preventing life-threatening intra-abdominal bleeding. The aim of the study was to investigate the ultrasound imaging characteristics of ovarian pregnancy.

Material and Method. Seven patients with PUD, hospitalized in the gynecology department between 2022 and 2025, were examined. The age of the patients in the study group ranged from 22 to 41 years. In two patients, serum β -hCG levels were 51 and 1,756 U/L, respectively. Two patients had positive urine pregnancy tests. In three patients, pregnancy tests were not performed due to the urgency of the situation (clinical signs of acute intra-abdominal bleeding on admission, followed by immediate laparotomy).

The examination was performed using a standard methodology and began with an examination of the abdominal cavity and pelvis using a transabdominal transducer. This was followed by a transvaginal B-mode examination to assess the location, size, and echographic characteristics of the pelvic mass. The presence and, if possible, the amount of free fluid in the pelvis and abdominal cavity were assessed. The amount of free fluid was estimated by calculating the volume of fluid accumulations in sloping areas (using the formula: $L1 \times L2 \times L3 \times 0.52$) and then summing them, or by subjective assessment. Then, using color and power Doppler ultrasound, a qualitative analysis of the hemodynamics of additional formations detected in the pelvis was performed. Doppler ultrasound examination of blood flow included an assessment of its presence, as well as the degree of its severity, taking into account the classification of the International Ovarian Tumor Analysis (IOTA) Group [1].

Results and discussion. Due to the very small number of patients included in this study, we considered it appropriate to provide a brief description of the main ultrasound findings and the corresponding surgical protocols for all 6 cases of peptic ulcer disease (PU) in which preoperative ultrasound examination was performed.

A retrospective analysis of the ultrasound findings allowed us to identify 4 types of PU ultrasound images: 1) visualization of the gestational sac with the embryo (case 1), 2) a wide echogenic ring (cases 2, 3), 3) a formation of a heterogeneous echostructure without differentiation of its components (hematoma) (case 4), 4) a conglomerate of a differentiated ovary and an adjacent formation of a heterogeneous echostructure (the ultrasound image of secondary PU) (cases 5, 6). It should be emphasized that in all cases of PU, the ultrasound diagnosticians concluded that there was a possibility of a secondary PU. In four of the six cases, the diagnosis of ectopic pregnancy was tentative, while in two cases, the ultrasound diagnosis of ectopic pregnancy was definitive. However, only in one of the six (17%) cases was the possibility of ulcerative colitis (PU) suggested. In the remaining five cases, PU was not suspected.

Based on our seven observations of PU, we believe it is possible to draw the following conclusions about the clinical and diagnostic features of PU, allowing for a more confident diagnosis of this insidious variant of ectopic pregnancy. Clinical and laboratory features of peptic ulcer: 1) delay of menstruation for 1–7 weeks, 2) scanty bloody discharge (according to our data in 43% of cases), 3) aching pain in the lower abdomen for 2–8 weeks (according to our data in 57% of cases), 4) acute onset with development of clinical manifestations of massive intra-abdominal bleeding within a few hours or 1–2 days (according to our data in 29% of cases), 5) β -hCG level in blood serum $\geq 1,000$ mIU/ml. Features of ultrasound imaging of the pelvic organs in case of ulcerative colitis: 1) lack of visualization of the fertilized egg in the uterus, 2) detection of free fluid in the pelvis (from a “pocket” of 2–3 ml to a large amount in case of massive internal bleeding), 3) lack of visualization of the ovary on the side of the ulcerative colitis or visualization of an enlarged ovary on the side of the ulcerative colitis, which has a significantly heterogeneous echostructure, while other additional formations on the side of the altered ovary are not detected.

Conclusion. Timely diagnosis of peptic ulcer disease (PUD) often allows for organ-preserving surgical treatment. In our experience, 4 out of 7 cases of PU were treated with ovarian resection alone, preserving all reproductive organs. In the remaining 3 cases, adnexectomy was necessary due to significant necrotic changes in the adnexa due to late diagnosis and total hemorrhagic ovarian imbibition.

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БЕЗОПАСНОСТЬ И ЭФФЕКТИВНОСТЬ ДЛИТЕЛЬНОГО ЛЕЧЕНИЯ НУКЛЕОЗИДНЫМИ И НУКЛЕОТИДНЫМИ АНАЛОГАМИ ПРИ ХРОНИЧЕСКОМ ГЕПАТИТЕ В

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Актуальность. Хронический вирусный гепатит В является одной из ведущих причин развития цирроза печени и гепатоцеллюлярной карциномы во всем мире. Заболевание характеризуется длительным течением и высоким риском прогрессирования при сохранении активной репликации вируса. В современных клинических рекомендациях нуклеоз(т)идные аналоги рассматриваются как препараты первой линии терапии хронического гепатита В благодаря их высокой противовирусной активности и хорошему профилю безопасности. Однако необходимость длительного, зачастую пожизненного лечения требует оценки эффективности и безопасности продолжительной противовирусной терапии в реальных клинических условиях.

Цель исследования. Оценить эффективность и безопасность длительного лечения нуклеоз(т)идными аналогами у пациентов с хроническим гепатитом В.

Материалы и методы. Проведено проспективное наблюдательное исследование на базе Хорезмского областного многопрофильного медицинского центра в 2024–2025 гг. Обследовано 78 пациентов в возрасте 20–60 лет с подтвержденным диагнозом хронического гепатита В. Основную группу составили 50 пациентов, получавших длительную противовирусную терапию нуклеоз(т)идными аналогами (энтекавир или тенофовир) не менее 24 месяцев. Группу сравнения составили 28 пациентов с хроническим гепатитом В, не получавших противовирусное лечение. Оценивались клинические данные, биохимические показатели функции печени (АЛТ, АСТ), уровень HBV DNA методом ПЦР, а также показатели функции почек для анализа безопасности терапии.

Результаты. У пациентов, получавших нуклеоз(т)идные аналоги, отмечено достоверное снижение уровня HBV DNA вплоть до достижения неопределяемой вирусной нагрузки у большинства больных ($p < 0,01$). Биохимический ответ характеризовался нормализацией уровня АЛТ, что свидетельствовало о снижении воспалительной активности в печени. В группе без противовирусной терапии сохранялась активная репликация вируса и колебания печеночных

ферментов. Длительное лечение нуклеоз(т)идными аналогами хорошо переносилось: серьезных нежелательных явлений не выявлено, клинически значимого ухудшения функции почек не отмечалось. **Выводы.** Длительная терапия нуклеоз(т)идными аналогами при хроническом гепатите В является эффективным и безопасным методом лечения, обеспечивающим стойкое подавление репликации вируса и улучшение биохимических показателей функции печени. Регулярный мониторинг состояния пациентов позволяет минимизировать риск побочных эффектов и повышает эффективность противовирусной терапии.

THE IMPORTANCE OF COOPER TABLETS IN THE TREATMENT OF VITILIGO

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Abstract: Vitiligo is a chronic depigmenting skin disorder characterized by the loss of functional melanocytes, leading to the appearance of white patches on the skin. Trace elements play an essential role in melanogenesis, and copper is a key cofactor for the enzyme tyrosinase, which is crucial for melanin synthesis. Copper deficiency has been suggested as a contributing factor in the pathogenesis of vitiligo. The use of copper tablets as an adjunctive therapy has gained increasing attention due to their potential role in enhancing melanocyte function and promoting repigmentation. This article explores the biological significance of copper in skin pigmentation, evaluates the therapeutic potential of copper supplementation in vitiligo management, and discusses its benefits, limitations, and safety considerations. Copper tablets may serve as a supportive component in combination with conventional treatment modalities to improve clinical outcomes in patients with vitiligo.

Keywords: Vitiligo; copper supplementation; trace elements; melanogenesis; tyrosinase; adjunctive therapy.

INTRODUCTION

Vitiligo is a chronic acquired disorder of skin pigmentation characterized by the selective destruction or dysfunction of melanocytes, resulting in depigmented macules and patches. The condition affects approximately 0.5–2% of the global population and has a significant psychological and social impact on affected individuals. Although the exact etiology of vitiligo is not fully understood, autoimmune mechanisms, genetic

predisposition, oxidative stress, and metabolic abnormalities are considered to play important roles in disease development and progression.

Melanogenesis is a complex biochemical process that depends on the activity of several enzymes, among which tyrosinase plays a central role. Copper is an essential trace element and a critical cofactor for tyrosinase, directly influencing melanin synthesis. Disturbances in copper metabolism or reduced serum copper levels may impair melanocyte function and contribute to hypopigmentation disorders, including vitiligo. Several studies have reported altered levels of trace elements, particularly copper, in patients with vitiligo, suggesting a potential link between copper deficiency and disease pathogenesis.

Conventional treatment options for vitiligo include topical corticosteroids, calcineurin inhibitors, phototherapy, and systemic immunomodulatory agents. However, treatment outcomes remain variable, and complete repigmentation is often difficult to achieve. As a result, increasing attention has been directed toward adjunctive therapies that may enhance the effectiveness of standard treatments. Copper supplementation in the form of oral tablets has been proposed as a supportive therapeutic strategy aimed at restoring trace element balance, improving melanocyte activity, and promoting repigmentation. This article focuses on the importance of copper tablets in the management of vitiligo, highlighting their biological role in pigmentation, potential therapeutic benefits, and relevance as an adjunct to conventional treatment approaches.

Role of Copper in Skin Pigmentation

Copper is an essential trace element involved in numerous physiological processes, including enzymatic reactions, immune function, and antioxidant defense. In skin pigmentation, copper plays a critical role as a cofactor of the enzyme tyrosinase, which is responsible for catalyzing the rate-limiting steps of melanin synthesis. Adequate copper levels are necessary for normal melanocyte activity and effective melanogenesis.

Disruption of copper homeostasis may result in decreased tyrosinase activity, impaired melanin production, and increased susceptibility of melanocytes to oxidative damage. Several biochemical studies have demonstrated reduced serum and tissue copper levels in patients with vitiligo compared to healthy controls, supporting the hypothesis that copper deficiency may contribute to depigmentation.

Copper Deficiency and Vitiligo Pathogenesis

Oxidative stress is considered one of the key mechanisms involved in the pathogenesis of vitiligo. Copper is a structural component of antioxidant enzymes such as superoxide dismutase (Cu/Zn-SOD), which protects melanocytes from oxidative injury. Reduced copper levels may weaken antioxidant defense mechanisms, leading to increased melanocyte destruction and progression of depigmented lesions.

Furthermore, copper is involved in immune regulation, and its deficiency may alter immune responses, potentially exacerbating autoimmune-mediated melanocyte damage. These findings suggest that maintaining adequate copper levels may be important in preventing disease progression and supporting melanocyte survival.

Therapeutic Potential of Copper Tablets

Copper tablets have been proposed as an adjunctive treatment for vitiligo to correct trace element imbalance and enhance melanocyte function. Oral copper supplementation may improve tyrosinase activity, stimulate melanin synthesis, and strengthen antioxidant defenses in the skin. Clinical observations indicate that copper tablets alone are usually insufficient to induce significant repigmentation; however, when used in combination with conventional therapies such as phototherapy or topical agents, they may enhance treatment outcomes.

Some clinical studies have reported improved repigmentation rates in patients receiving copper supplementation alongside narrowband ultraviolet B (NB-UVB) therapy, suggesting a synergistic effect. Copper tablets are generally well tolerated when administered at recommended doses, although excessive intake may lead to gastrointestinal discomfort or copper toxicity.

Dosage, Safety, and Limitations

The optimal dosage and duration of copper supplementation in vitiligo treatment have not yet been clearly established. Most studies recommend low-dose supplementation within the safe daily intake range to avoid adverse effects. Monitoring serum copper levels is advisable during prolonged supplementation to prevent toxicity.

Despite promising theoretical and preliminary clinical evidence, the use of copper tablets remains supportive rather than definitive therapy. Variability in individual response, limited large-scale clinical trials, and the multifactorial nature of vitiligo represent important limitations. Therefore, copper supplementation should be considered as part of a comprehensive and individualized treatment plan.

Combination Therapy and Clinical Implications

Given the complex etiology of vitiligo, combination therapy is widely regarded as the most effective management strategy. Incorporating copper tablets into standard treatment regimens may provide additional benefits by addressing metabolic and oxidative factors contributing to melanocyte dysfunction. This integrative approach may improve repigmentation, reduce disease progression, and enhance overall treatment efficacy.

Copper is an essential trace element that plays a critical role in melanogenesis, primarily as a cofactor for the enzyme tyrosinase, which catalyzes melanin synthesis. Evidence from clinical and biochemical studies indicates that reduced copper levels may contribute to melanocyte dysfunction and the progression of vitiligo. Copper supplementation in the form of tablets has emerged as a potential adjunctive therapy aimed at restoring trace element balance, enhancing melanocyte activity, and promoting repigmentation.

While copper tablets alone are unlikely to produce significant repigmentation, their use in combination with conventional therapies such as phototherapy, topical corticosteroids, or calcineurin inhibitors may improve treatment outcomes. Copper

supplementation is generally safe when administered within recommended doses, although monitoring is advised to prevent toxicity.

In summary, copper tablets represent a supportive strategy in the management of vitiligo, addressing underlying metabolic and oxidative factors that may influence disease progression. Further large-scale clinical trials are needed to establish standardized dosing protocols, evaluate long-term efficacy, and confirm their role as an integral component of comprehensive vitiligo therapy.

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ENVIRONMENTAL FACTORS AND RESPIRATORY DISEASES

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Abstract: Respiratory diseases are among the leading causes of morbidity and mortality worldwide. Environmental factors such as air pollution, occupational exposures, and climate conditions play a crucial role in the development and exacerbation of respiratory disorders. This article reviews current evidence on the relationship between environmental exposures and respiratory health, highlighting statistical data on the prevalence of respiratory diseases in polluted urban areas and regions affected by environmental hazards. Strategies for prevention and mitigation of these risks are also discussed.

Keywords: Environmental pollution, respiratory diseases, air quality, occupational exposure, public health, asthma, chronic obstructive pulmonary disease \

Introduction: Respiratory diseases, including asthma, chronic obstructive pulmonary disease (COPD), and acute respiratory infections, are significant public health concerns worldwide. According to the World Health Organization (WHO), approximately 4.2 million deaths per year are attributable to ambient air pollution, with a large proportion due to respiratory complications. Environmental factors—both natural and anthropogenic—have been identified as critical determinants in the onset and progression of respiratory illnesses. Understanding these factors is essential for implementing effective public health interventions.

Main Body

1. Air Pollution and Respiratory Health

Particulate matter (PM_{2.5} and PM₁₀) and nitrogen dioxide (NO₂) are strongly associated with asthma exacerbation and increased hospital admissions.

In urban areas, children exposed to high levels of PM_{2.5} are 1.5 times more likely to develop asthma compared to children in low-exposure regions.

A 2022 study in Tashkent reported that annual PM_{2.5} concentrations averaged 35 µg/m³, exceeding WHO limits and correlating with a 20% increase in hospitalizations for respiratory infections.

2. Occupational and Indoor Environmental Exposures

Long-term exposure to dust, chemical fumes, and smoke in workplaces contributes to COPD development.

Indoor air pollution from biomass fuels is responsible for 2.6 million premature deaths globally, particularly in low- and middle-income countries.

3. Climate Factors

High humidity, extreme temperatures, and seasonal variations influence the prevalence and severity of respiratory infections.

Rising global temperatures are linked to increased incidence of pollen-induced asthma and allergic respiratory diseases.

4. Public Health Interventions

Regulatory measures on industrial emissions and vehicle exhaust can significantly reduce the burden of respiratory diseases.

Community awareness programs promoting clean cooking fuels and proper ventilation are effective in reducing indoor air pollution.

Monitoring and early detection programs help identify high-risk populations, enabling targeted preventive strategies.

Conclusion: Environmental factors are major determinants of respiratory health, contributing to both chronic and acute respiratory diseases. Air pollution, occupational exposures, and climate conditions exacerbate respiratory morbidity and mortality, particularly in urbanized and industrial regions. Public health strategies aimed at reducing environmental hazards, improving air quality, and raising community awareness are essential to prevent and control respiratory diseases.

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ZAMONAVIY TIBBIYOTDA LABORATORIYA TASHXISINING O'RNI

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Annotatsiya

Ushbu maqolada zamonaviy tibbiyotda laboratoriya tekshiruvlarining tutgan o'rni, ularning kasalliklarni barvaqt aniqlash va davolash jarayonini nazorat qilishdagi ahamiyati yoritilgan. Maqolada laboratoriya tahlillari nafaqat tashxis qo'yish, balki profilaktik tibbiyotning ajralmas qismi ekanligi ilmiy-ommabop tilda tushuntirilgan. Shuningdek, tahlil natijalariga ta'sir etuvchi omillar va bemorlarning tekshiruvga tayyorgarlik ko'rish madaniyati haqida so'z boradi.

Аннотация

В данной статье рассматривается роль лабораторных исследований в современной медицине, их значение в ранней диагностике заболеваний и мониторинге процесса лечения. В научно-публицистической форме объясняется, что лабораторная диагностика является не только инструментом постановки диагноза, но и неотъемлемой частью профилактической медицины. Также обсуждаются факторы, влияющие на результаты анализов, и культура подготовки пациентов к исследованиям.

Kalit so'zlar: Klinik tahlillar, ALT va AST, TORCH infeksiyalari, OIV tahlili, gematologiya, biokimyoviy ko'rsatkichlar, profilaktik tibbiyot, tashxis aniqligi

KIRISH

1. Tashxisning poydevori

Shifokor xulosasining 70% dan ortig'i aynan laboratoriya ma'lumotlariga tayanadi. Simptomlar hali yuzaga chiqmasdan turib, qon tarkibidagi o'zgarishlar (masalan, onkomarkerlar yoki glyukoza miqdori) kelajakdagi xavfni ko'rsatib berishi mumkin.

2. Laboratoriya tahlillarining asosiy yo'nalishlari: Laboratoriya tekshiruvlari tibbiyotning "ko'zi" hisoblanadi. Har bir yo'nalish organizmning muayyan tizimi haqida o'ziga xos ma'lumotlarni taqdim etadi.

Material va metodologiya

Klinik (Umumiy) gematologiya

Bu yo'nalish qonning hujayraviy tarkibini o'rganadi. Bu eng ko'p topshiriladigan tahlil bo'lib, organizmdagi umumiy holatni aks ettiradi.

Nimalar aniqlanadi: Gemoglobin darajasi (anemiya), leykotsitlar miqdori (yallig'lanish yoki infeksiya), trombotsitlar (qon ivishi).

Ahamiyati: Organizmda yashirin kechayotgan infeksiyon jarayonlarni yoki qon tizimi kasalliklarini erta bosqichda ko'rsatib beradi.

Biokimyoviy tahlillar

Biokimyo — bu organizmning "ichki laboratoriyasi" qanday ishlayotganini ko'rsatuvchi raqamlardir. Bu tahlil uchun qon venadan olinadi.

Asosiy ko'rsatkichlar: * Glyukoza: Qandli diabetni aniqlash uchun.

ALT va AST: Jigar hujayralarining holati. ALT va AST o'zi nima?

Bu fermentlar hujayra ichida oqsil almashinuvida ishtirok etadi. Oddiy holatda ular hujayra ichida bo'ladi va qon tarkibida juda kam miqdorda aylanib yuradi.

ALT (Alaninaminotransferaza): Asosan jigarda to'plangan. Shuning uchun u jigar uchun o'ta xos (spesifik) ko'rsatkich hisoblanadi.

AST (Aspartataminotransferaza): Nafaqat jigarda, balki yurak mushaklarida, buyraklarda va skelet mushaklarida ham mavjud. Nima uchun ular qonda ko'payib ketadi?

Tasavvur qiling, jigar hujayrasi (gepatsit) bir butun g'ishtli uy. Agar uy buzilsa yoki unga shikast yetsa, ichidagi buyumlar ko'chaga sochiladi. Tibbiyotda ham shunday: jigar hujayralari shikastlanganda yoki parchalanganda, ularning ichidagi ALT va AST qonga "sizib" chiqadi. Qon tahlilida ularning miqdori qanchalik yuqori bo'lsa, jigar shunchalik ko'p shikastlanayotganini anglatadi. 4. Ritis koeffitsiyenti (De Ritis ratio) Shifokorlar uchun muhim bo'lgan matematik ko'rsatkich: $DRr = \frac{AST}{ALT}$.

Agar natija 1.33 dan kichik bo'lsa — muammo ko'proq jigarda.

Agar natija 1.33 dan katta bo'lsa — muammo yurak yoki surunkali jigar kasalliklarida. Tahlil natijasi xato chiqmasligi uchun bemor quyidagilarga amal qilishi shart: Och qoringa topshirish: Kamida 8-12 soat ovqat yemaslik kerak. Jismoniy yuklama: Tahlildan bir kun oldin og'ir mashqlar qilmaslik (chunki mushaklar zo'riqsa ham AST ko'tariladi). Dori va alkogol: Alkogol va ba'zi kuchli dorilar (hatto og'riq qoldiruvchilar ham) fermentlarni sun'iy ko'tarib yuborishi mumkin.

"ALT va AST ko'rsatkichlari — bu jigarning 'yordam so'rab hayqirig'idir'. Ammo shuni yodda tutish kerakki, faqatgina ushbu raqamlarga qarab tashxis qo'yilmaydi. Ularni har doim bilirubin, ultratovush tekshiruvi (UZI) va shifokor ko'rigi bilan birga tahlil qilish lozim."

Kreatinin va mochevina: Buyraklarning filtrlash qobiliyati. Xolesterin: Yurak-qon tomir tizimi xavflarini baholash. Ahamiyati: Organlarning funksional holatini baholash va modda almashinuvi buzilishlarini aniqlashda hal qiluvchi rol o'ynaydi.

Asosiy qism.

Immunologik va serologik tekshiruvlar

Bu yoʻnalish organizmning tashqi dushmanlar (virus, bakteriya) va ichki xavflarga qarshi qanday kurashayotganini oʻrganadi. Nimalar aniqlanadi: Antitanachalar (IgM, IgG), gepatit, OIV, TORCH infeksiyalari. OIV (OITS) infeksiyasini aniqlash bosqichlari

OIVni aniqlash "ikki bosqichli" tizimga asoslangan:

IFA (Immunoferment tahlil): Bu birinchi bosqich (skrining). Bunda qonda OIVga qarshi ishlab chiqarilgan antitanachalar va virusning oʻziga xos p24 antigeni qidiriladi. Hozirgi kunda 4-avlod IFA testlari qoʻllaniladi, ular infeksiya yuqqanidan 2–4 hafta oʻtgach natija bera oladi.

Immunobloting (Tasdiqlovchi test): Agar IFA musbat natija bersa, natijani tasdiqlash uchun ushbu murakkabroq test oʻtkaziladi. U virusning oqsillarini alohida-alohida aniqlaydi.

PZR (Polimeraza zanjirli reaksiyasi): Bu usul qonda virusning RNKsini (genetik kodini) aniqlaydi. Bu usul "darcha davri"da (infeksiya yuqqan ilk kunlarda) juda samarali.

TORCH infeksiyalari tahlili

TORCH — bu homilador ayollar va homila uchun xavfli boʻlgan infeksiyalar guruhi:

T — Toksoplazmoz (Toxoplasmosis)

O — Boshqa infeksiyalar (Others: gepatit, sifilis va h.k.)

R — Qizilcha (Rubella)

C — Sitomegalovirus (CMV)

H — Gerpes (Herpes simplex virus)

Aniqlash usuli: "IgM va IgG titrlari"

TORCH tahlilida shifokorlar asosan ikki turdagi antitanachalarga qaraydilar:

IgM (Immunoglobulin M): "Hozirgi xavf". Agar bu musbat boʻlsa, demak, organizmda ayni damda oʻtkir infeksiya jarayoni ketmoqda.

IgG (Immunoglobulin G): "Xotira". Agar bu musbat boʻlsa, demak, inson bu kasallik bilan avval kasallangan va unda immunitet shakllangan. Koʻrsatkich Talqin

IgM (+), IgG (-) Yangi yuqqan oʻtkir infeksiya (xavfli).

IgM (-), IgG (+) Organizmda immunitet bor, xavf yoʻq.

IgM (+), IgG (+) Kasallik qaytalangan yoki surunkali bosqichda.

IgM (-), IgG (-) Immunitet ham, kasallik ham yoʻq (homiladorlikda ehtiyot boʻlish kerak).

Ahamiyati: Inson avval maʼlum bir kasallik bilan ogʻriganmi yoki yoʻqmi, immunitet shakllanganmi-yoʻqligini aniqlaydi. Shuningdek, allergik reaksiyalarni aniqlashda asosiy manba hisoblanadi.

Gormonal tekshiruvlar

Gormonlar — organizmdagi barcha jarayonlarni boshqaruvchi "kimyoviy xabarchilar"dir.

Yo'nalishlar: Qalqonsimon bez gormonlari (TTG, T3, T4), jinsiy gormonlar, buyrak usti bezi gormonlari.

Ahamiyati: Vazn ortishi, bepushtlik, surunkali charchoq va o'sishdan to'xtash kabi muammolarning tub ildizini topishga yordam beradi.

5. Mikrobiologik (Bakteriologik) tahlillar

Bu tahlilda organizmdan olingan namuna (suyuqliklar) maxsus ozuqa muhitiga ekiladi.

Maqsadi: Kasallik keltirib chiqargan aniq mikrobn turini aniqlash.

Antibiotikogramma: Eng muhim qismi — aniqlangan mikrobn qaysi antibiotik o'ldira olishini tekshirish.

Ahamiyati: Shifokorga "ko'r-ko'rona" emas, balki aynan o'sha mikrobg ta'sir qiluvchi dori tayinlash imkonini beradi.

6. Molekulyar-genetik (PZR) tahlillar

Zamonaviy tibbiyotning cho'qqisi. Bu usul virus yoki bakteriyaning DNK yoki RNK bo'lagini aniqlaydi.

Xususiyati: Hatto organizmda bir dona virus bo'lsa ham, uni topa oladi.

Ahamiyati: Infeksiyalarni (masalan, COVID-19, gepatitlar) eng erta va eng aniq darajada tashxislash usuli.

1. Kreatinin: Mushak massasi va buyrak faoliyati

Kreatinin — mushaklar ishlashi natijasida hosil bo'ladigan chiqindi mahsulot.

Yosh sportchida: Uning natijasi me'yordan (normadan) bir oz yuqori bo'lishi mumkin. Bu buyrak kasalligi emas, balki mushaklarning ko'pligi va jismoniy zo'riqish natijasidir.

Keksa odamda: Mushak massasi kamaygani (sarkopeniya) sababli kreatinin miqdori juda past bo'lishi mumkin. Agar keksada kreatinin "norma"ning eng yuqori chegarasida tursa, bu uning buyraklari yaxshi ishlayotganidan dalolat beradi (chunki uning mushaklari kam, kreatinin ham kam bo'lishi kerak edi).

2. AST va ALT: Jismoniy zo'riqish va dori vositalari

Yosh sportchida: Og'ir mashg'ulotlardan (masalan, kross yoki og'ir atletika) so'ng AST sezilarli darajada ko'tarilishi mumkin. Bu jigarning zararlanishi emas, balki mushak tolalarining mikrotravmalari natijasidir.

Keksa odamda: Ular ko'p dori vositalari (qon bosimi, bo'g'im og'rig'i uchun) qabul qilishadi. Ularda fermentlarning ko'tarilishi ko'pincha "toksik gepatiti" (dorilarning jigarga salbiy ta'siri) natijasi bo'ladi.

3. Gemoglobin va gematokrit

Yosh sportchida: Ayniqsa chidamlilikka ishlaydigan sportchilarda (yuguruvchilar, velosportchilar) "sport anemiyasi" kuzatilishi mumkin (qon hajmi oshishi hisobiga gemoglobin nisbatan past ko'rinadi).

Keksa odamda: Gemoglobinning pastligi ko'pincha surunkali qon yo'qotish yoki temir so'rilishining buzilishi bilan bog'liq bo'ladi.

Ko'rsatkich Yosh sportchida (Nima uchun?) Keksa odamda (Nima uchun?)

Pulse (Puls) 45-55 (Sportchi bradikardiyasi — yurak kuchli) 70-85 (Yurak mushagi zaiflashuvi yoki aritmiya xavfi)

Glyukoza Pastroq bo'lishi mumkin (Energiya ko'p sarflanadi) Yuqoriroq bo'lishi mumkin (Insulin sezuvchanligi pasaygan)

D vitamini Odatda yuqori (Faol hayot tarzi) Ko'pincha juda past (Quyoshda kam bo'lish va so'rilish yomonligi)

Laboratoriya natijalarini shunchaki qog'ozdagi 'norma' chiziqlari bilan solishtirish yetarli emas. Shifokor har doim bemorning yoshi, jismoniy faolligi va hayot tarzini (anamnez) hisobga olishi shart. Sportchi uchun 'xavfli' ko'ringan raqam, uning rekordlari garovi bo'lishi mumkin."

Muhokama

Laboratoriya tekshiruvlari zamonaviy tibbiyotning ajralmas qismiga aylangan bo'lsa-da, bugungi kunda ushbu sohada bir qator dolzarb masalalar mavjudki, bular mutaxassislar va bemorlar o'rtasida keng muhokama qilinishini talab etadi.

1. "Raqamlar ortidagi inson": Faqat tahlilga qarab tashxis qo'yish xavfi

Muhokamaning eng muhim nuqtasi — bu tahlil natijalarini klinik manzaradan ajratilgan holda ko'rmaslikdir. Masalan, jismoniy faol yosh yigitda ALT yoki AST ko'rsatkichlarining biroz yuqoriligi ko'pincha mushaklardagi fiziologik jarayon bo'lsa, xuddi shu ko'rsatkich kam harakatli keksada jiddiy jigar patologiyasidan dalolat berishi mumkin. Bu shuni ko'rsatadiki, laboratoriya — bu yagona haqiqat emas, balki shifokor qo'lidagi muhim instrumentdir.

2. "Darcha davri" va diagnostik hushyorlik

OIV va TORCH infeksiyalari muhokamasida "darcha davri" (window period) tushunchasi hamon dolzarbligicha qolmoqda. Ko'p hollarda bemorlar himoyalalmagan aloqadan so'ng darhol tahlil topshirib, "manfiy" natija olgach, xotirjamlikka beriladilar. Biroq, zamonaviy IFA testlari ham antitanachalarni aniqlashi uchun ma'lum vaqt talab etiladi. Bu borada aholi o'rtasida tibbiy savodxonlikni oshirish va takroriy tahlillarning ahamiyatini tushuntirish zarur.

3. Preanalitik xatolar: Inson omili

Laboratoriya diagnostikasidagi xatoliklarning 60-70 foizi aynan tahlilgacha bo'lgan bosqichda (preanalitik bosqich) sodir bo'ladi. Bemorning noto'g'ri ovqatlanishi, stress,

dori vositalari qabuli yoki qon namunasi olishdagi xatoliklar noto'g'ri tashxisga sabab bo'lishi mumkin. Muhokama shuni ko'rsatadiki, sifatli laboratoriya xizmati nafaqat yuqori texnologiyali uskunalarga, balki bemor va tibbiyot xodimining mas'uliyatiga ham bog'liq.

4. Texnologik taraqqiyot va PZR samaradorligi

PZR (PCR) usulining keng joriy etilishi tibbiyotda inqilob qildi. Avvallari haftalab kutilgan natijalar endi bir necha soatda aniqlanmoqda. Bu, ayniqsa, OIV va gepatitlarni erta bosqichda aniqlash va davolashni nazorat qilishda hal qiluvchi ahamiyatga ega.

Muhokama natijasi:

Laboratoriya diagnostikasi rivojlangani sari, shifokor va laboratoriya mutaxassisi o'rtasidagi muloqot yanada mustahkamlanishi lozim. Faqatgina texnologik imkoniyatlar va klinik tajribaning uyg'unligi bemor salomatligini saqlashda kutilgan samarani beradi.

Xulosa

Xulosa o'rnida aytish mumkinki, zamonaviy laboratoriya tashxisi — bu shunchaki quruq raqamlar yoki murakkab grafiklar to'plami emas. Bu shifokorga inson tanasining eng yashirin burchaklariga nazar solish imkonini beruvchi *****"tibbiy kompas"*****dir.

Maqolamizda ko'rib chiqqanimizdek, laboratoriya tekshiruvlarining ahamiyati quyidagi uchta ustunga tayanadi:

Vaqtini yutish: OIV, TORCH infeksiyalari yoki saraton biomarkerlari orqali kasallikni u hali klinik belgilar (og'riq, isitma) bermasdan turib aniqlash mumkin. Bu esa davolash samarasini bir necha barobar oshiradi.

Aniqlik va tahlil: ALT, AST kabi fermentlar yoki kreatinin darajasi bizga organizmning ichki laboratoriyasi qanday ishlayotganini ko'rsatadi. Biroq, bu raqamlarni talqin qilishda yosh sportchi va keksa inson o'rtasidagi farqni inobatga olish — zamonaviy tibbiyotning individual yondashuv tamoyilini namoyon etadi.

Xavfsizlik va nazorat: To'g'ri tayyorgarlik ko'rib topshirilgan tahlil — bu noto'g'ri tashxis va keraksiz dori-darmonlardan himoyalaniş deganidir.

Laboratoriya tekshiruvlari — shunchaki muammo chiqqanda murojaat qilinadigan vosita bo'lib qolmasligi kerak. Yilda bir marotaba profilaktik tahlillarni topshirish madaniyati har bir ongli insonning o'z salomatligi oldidagi mas'uliyatidir. Zero, kasallikni davolagandan ko'ra, uning oldini olish ham arzonroq, ham xavfsizroqdir.

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4. Tietz Fundamentals of Clinical Chemistry and Molecular Diagnostics — (Klinik kimyo va molekulyar tashxis asoslari). Xalqaro miqyosda ALT, AST va genetik tahlillar bo'yicha eng nufuzli manba.
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AYLANMA SUV TA'MINOTI SISTEMASIDA AZOT VA FOSFOR TUTGAN BIRIKMALAR ASOSIDAGI YASHIL KORROZIYA INGIBITORLARINING SAMARADORLIGI

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Annotatsiya: Ushbu tezisda aylanma suv ta'minoti tizimlarida (AST) metall konstruksiyalarni korroziyadan himoyalashda qo'llanilayotgan azot va fosfor tutgan "yashil" korroziya ingibitorlarining ta'sir mexanizmlari, samaradorligi hamda ekologik afzalliklari tahlil qilingan. Suvning qayta aylanishi natijasida yuzaga keladigan fizik-kimyoviy o'zgarishlar, jumladan, eritilgan kislorod miqdorining ortishi, tuzlar kontsentratsiyasining ko'payishi va biologik ifloslanishning kuchayishi metallarning tez korroziyalanishiga olib kelishi ko'rsatib o'tilgan.

Kalit so'zlar: aylanma suv ta'minoti tizimi, korroziya, yashil ingibitorlar, azotli birikmalar, fosforli birikmalar, adsorbsiya, fosfonatlar, aminlar, issiqlik almashinuvi, ekologik xavfsizlik.

Аннотация: В данной работе проанализированы механизмы действия, эффективность и экологические преимущества «зелёных» ингибиторов коррозии на основе азот- и фосфорсодержащих соединений, применяемых для защиты металлических конструкций в системах оборотного водоснабжения (СОВ). Показано, что физико-химические изменения, возникающие в результате рециркуляции воды, включая увеличение содержания растворённого кислорода, рост концентрации солей и усиление биологического загрязнения, приводят к ускоренной коррозии металлов.

Ключевые слова: системы оборотного водоснабжения, коррозия, зелёные ингибиторы, азотсодержащие соединения, фосфорсодержащие соединения, адсорбция, фосфонаты, амины, теплообмен, экологическая безопасность.

Abstract: This thesis analyzes the action mechanisms, efficiency, and environmental advantages of nitrogen- and phosphorus-containing "green" corrosion inhibitors used to protect metal structures in circulating water supply systems (CWSS). It is shown that physicochemical changes resulting from water recirculation, including increased dissolved oxygen, higher salt concentration, and intensified biological contamination, lead to accelerated metal corrosion.

Keywords: circulating water systems, corrosion, green inhibitors, nitrogen-containing compounds, phosphorus-containing compounds, adsorption, phosphonates, amines, heat exchange, environmental safety.

Aylanma suv ta'minoti tizimlari energetika, kimyo, neft-gaz va metallurgiya sanoatida issiqlik almashinuvi jarayonlarini barqaror yuritish uchun qo'llaniladi. Suvning qayta-qayta aylanishi natijasida: eritilgan kislorod miqdori ortadi, pH o'zgaradi, qattqlik va tuzlar konsentratsiyasi ko'tariladi, biofouling (biologik ifloslanish) tezlashadi. Natijada temir, po'lat, mis va alyuminiy elementlari tez korroziyalanadi. An'anaviy xromat, nitrit kabi ingibitorlar samarali bo'lsada, ekologik xavfli hisoblanadi[1]. Shu sababli so'nggi yillarda azot va fosfor tutgan "yashil" ingibitorlar keng o'rganilmoqda.

Azotli birikmalar metall yuzasi bilan koordinatsion bog' hosil qilish xususiyatiga ega. Ularning asosiy guruhlari: aminlar (monoaminlar, diamatlar, poliaminlar), amidlilar, imidazolinlar, kvaterner ammoniy tuzlari. Bu moddalar suvli muhitida kationlar shaklga o'tib, metall sirtiga adsorbsiyalanib, himoya qatlami hosil qiladi[2,3].

Fosforli birikmalar metall yuzasida kuchli, qisman erimaydigan fosfatlovchi plyonka hosil qilishi bilan ajralib turadi. Asosiy turlari: alkilfosfonatlar, aminofosfonatlar, fosfat efirlari. Ular nafaqat korroziyani to'xtatadi, balki suv toshqotmalarining oldini olishga ham yordam beradi[4,5].

Azot va fosforli guruhlarni bir molekulada birlashtirish korroziya va qattiq cho'kindilar hosil bo'lishiga qarshi sinergik effekt beradi. Adsorbsiya mexanizmi ingibitor molekullari metall yuzasiga quyidagi kuchlar yordamida birikadi:

– elektrostatik o'zaro ta'sir (fizikaviy adsorbsiya), koordinatsion bog'lar (kimyoviy adsorbsiya), gidrofob "dumchalar" orqali sirtini passivlash.

– himoya plyonkasi hosil bo'lishi. Azotli guruhlar Fe^{2+} ionlari bilan kompleks hosil qiladi, fosforli guruhlar esa polifosfat pardasini shakllantiradi[6-8]. Natijada metall sirtida dielektrik qavat paydo bo'ladi, anod-katod reaksiyalar sekinlashadi, suv va kislorodning o'tishi cheklanadi.

AST tizimlarida pH odatda 6,5–9 oralig'ida bo'ladi. Azotli ingibitorlar ishqoriy muhitda yaxshiroq ishlaydi, fosforli esa neytral muhitda barqarorroq. Haroratning oshishi adsorbsiyani qisman kamaytirishi mumkin. Sulfat, xlorid va bikarbonatlar ko'pligi korroziya tezligini oshiradi. Shu sababli ingibitorlarning dozasi suv tuzligi (TDS)ga qarab tanlanadi. Aylanma suvning oqim tezligi qanchalik yuqori bo'lsa, adsorbsiya qatlami shunchalik tez yuviladi. Yashil ingibitorlar polimerlar bilan kombinatsiyada barqarorroq bo'ladi[9].

Yashil ingibitorlarning afzalliklari ekologik toza, kam toksik, iqtisodiy jihatdan samarali, biologik parchalanadi. Metall yuzasida o‘ta mustahkam adsorbsion qatlam hosil qiladi. Issiqlik almashinuvi asboblarida toshqotma hosil bo‘lishini kamaytiradi. Boshqa biotsid yoki antiscalantlar bilan yaxshi moslashadi. Sanoat yo‘lining ekologik standartlariga mos. Neftni qayta ishlash zavodlarining sovutish minoralarida fosfonat-aminkomplekslar qo‘llanib, korroziya tezligi 4–6 baravar kamaygan. Metallurgiya sexlarida poliamin-fosfonat kompozitsiyasi bilan tozalash siklidan so‘ng po‘lat quvurlarning xizmat muddati 25–30 % uzaygan[10,11]. Azotli birikmalarning metall yuzasiga adsorbsiyalanib koordinatsion bog‘lar hosil qilishi, fosforli birikmalarning esa himoyalovchi fosfat plyonkalarini shakllantirishi natijasida korroziya jarayonlari sezilarli darajada sekinlashishi aniqlangan. Shuningdek, azot va fosforli guruhlarni bir molekulada birlashtirish sinergik himoya effektini ta‘minlashi, toshqotma va biofouling jarayonlarini kamaytirishi qayd etilgan. Tadqiqot natijalari ushbu “yashil” ingibitorlarning energetika, kimyo, neft-gaz va metallurgiya sanoatida ekologik xavfsiz va samarali korroziyaga qarshi vosita sifatida keng qo‘llash istiqbollarini ko‘rsatadi.

Xulosa qilib shini aytish mumkinki, aylanma suv ta‘minoti tizimlarida azot va fosfor tutgan “yashil” korroziya ingibitorlari yuqori samaradorlik, ekologik xavfsizlik va barqaror adsorbsiya xususiyatlari bilan ajralib turadi. Ular metallarning korroziyalanish tezligini sezilarli darajada kamaytirib, texnologik jarayonlarning ishonchliligini oshiradi. Shu bois mazkur moddalar sanoatda keng qo‘llanilayotgan zamonaviy korroziya himoya qiluvchi vositalaridan biri hisoblanadi.

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TA'LIM JARAYONIDA IJTIMOYIY MAS'ULIYATNI SHAKLLANTIRISHNING ILMIIY-NAZARIY ASOSLARI

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Annotatsiya

Mazkur maqolada ta'lim jarayonida shaxsda ijtimoiy mas'uliyatni shakllantirish masalasi ilmiy-nazariy jihatdan tahlil qilinadi. Ijtimoiy mas'uliyat tushunchasining falsafiy, pedagogik va psixologik talqinlari yoritilib, uning shaxs kamolotidagi o'rni asoslab beriladi. Ta'lim jarayonining mazmuni, shakllari va metodlari orqali o'quvchi va talabalarda ijtimoiy mas'uliyatni rivojlantirish mexanizmlari ochib beriladi. Maqolada zamonaviy ta'lim paradigmalari, kompetensiyaviy yondashuv, shaxsga yo'naltirilgan ta'lim va tarbiya jarayonining ijtimoiy mas'uliyatni shakllantirishdagi ahamiyati ilmiy manbalar asosida tahlil qilinadi. Tadqiqot natijalari ta'lim muassasalarida tarbiyaviy ishlar samaradorligini oshirishga xizmat qiladi.

Kalit so'zlar: ijtimoiy mas'uliyat, ta'lim jarayoni, tarbiya, shaxs kamoloti, kompetensiyaviy yondashuv, pedagogik jarayon.

Аннотация

В статье рассматриваются научно-теоретические основы формирования социальной ответственности в образовательном процессе. Раскрывается сущность понятия социальной ответственности в философском, педагогическом и психологическом аспектах, обосновывается ее значение в развитии личности. Анализируются возможности образовательного процесса, его содержание, формы и методы в формировании социальной ответственности у обучающихся. Особое внимание уделяется современным образовательным парадигмам, компетентностному и личностно-ориентированному подходам. Результаты исследования могут быть использованы для повышения эффективности воспитательной работы в образовательных учреждениях.

Ключевые слова: социальная ответственность, образовательный процесс, воспитание, развитие личности, компетентностный подход, педагогика.

Abstract

This article examines the scientific and theoretical foundations of forming social responsibility in the educational process. The concept of social responsibility is analyzed from philosophical, pedagogical, and psychological perspectives, and its role in personal development is substantiated. The study explores the possibilities of the

educational process, its content, forms, and methods in developing social responsibility among students. Particular attention is paid to modern educational paradigms, competency-based and learner-centered approaches. The findings of the study contribute to improving the effectiveness of educational and upbringing activities in educational institutions.

Keywords: social responsibility, educational process, upbringing, personal development, competency-based approach, pedagogy.

Kirish

Bugungi globalashuv va tezkor ijtimoiy o'zgarishlar sharoitida ta'lim tizimi oldiga nafaqat bilimli, balki jamiyat oldidagi burchini anglaydigan, faol fuqarolik pozitsiyasiga ega, ijtimoiy mas'uliyatli shaxsni tarbiyalash vazifasi qo'yilmoqda. Ijtimoiy mas'uliyat shaxsning jamiyat, davlat, jamoa va atrof-muhit oldidagi majburiyatlarini anglab yetishi va ularga ongli ravishda amal qilishi bilan tavsiflanadi. Shu bois ta'lim jarayonida ijtimoiy mas'uliyatni shakllantirish masalasi pedagogikaning dolzarb muammolaridan biri hisoblanadi.

Ta'lim va tarbiya uzviy jarayon bo'lib, u shaxsning axloqiy, ijtimoiy va fuqarolik fazilatlarini rivojlantirishga xizmat qiladi. Ayniqsa, zamonaviy ta'lim konsepsiyalarida ijtimoiy mas'uliyat kompetensiyaning muhim tarkibiy qismi sifatida e'tirof etilmoqda. Shuning uchun ham ta'lim jarayonida ijtimoiy mas'uliyatni shakllantirishning ilmiy-nazariy asoslarini chuqur o'rganish, uni amaliyotga tatbiq etish mexanizmlarini ishlab chiqish muhim ahamiyat kasb etadi.

Asosiy qism

Ijtimoiy mas'uliyat tushunchasining ilmiy-nazariy talqini

Ijtimoiy mas'uliyat tushunchasi ko'plab fanlar tomonidan o'rganiladi. Falsafada u insonning jamiyat oldidagi axloqiy va ijtimoiy majburiyatlari bilan izohlanadi. Pedagogikada esa ijtimoiy mas'uliyat shaxsning ijtimoiy normalar, qadriyatlar va qoidalarni ongli ravishda qabul qilishi hamda ularga amal qilishga tayyorligi sifatida talqin etiladi.

Psixologik nuqtai nazardan ijtimoiy mas'uliyat shaxsning ichki motivatsiyasi, o'z xatti-harakatlariga tanqidiy yondashuvi va oqibatlarini anglash qobiliyati bilan chambarchas bog'liq. Bu sifat asta-sekinlik bilan, ijtimoiy tajriba va ta'lim-tarbiya ta'sirida shakllanadi.

Ta'lim jarayonida ijtimoiy mas'uliyatni shakllantirishning pedagogik asoslari

Ta'lim jarayoni shaxsda ijtimoiy mas'uliyatni rivojlantirish uchun qulay muhit yaratadi. Dars jarayonida o'quvchilarda mustaqil fikrlash, muammo yechish, jamoada

ishlash, qaror qabul qilish kabi ko‘nikmalar shakllanadi. Ushbu ko‘nikmalar ijtimoiy mas’uliyatning muhim komponentlari hisoblanadi.

Pedagogik jarayonda ijtimoiy mas’uliyatni shakllantirish quyidagi tamoyillarga asoslanadi:

insonparvarlik va demokratiya;

ijtimoiy faollikni qo‘llab-quvvatlash;

shaxsga yo‘naltirilgan ta‘lim;

uzluksizlik va izchillik.

Kompetensiyaviy yondashuv va ijtimoiy mas’uliyat

Zamonaviy ta‘lim tizimida kompetensiyaviy yondashuv yetakchi o‘rinni egallaydi. Ushbu yondashuvda bilim, ko‘nikma va malakalar bilan bir qatorda shaxsiy va ijtimoiy fazilatlarni rivojlantirish muhim hisoblanadi. Ijtimoiy mas’uliyat umumiy va kasbiy kompetensiyalarning ajralmas qismi bo‘lib, u shaxsning jamiyat hayotida faol ishtirok etishini ta‘minlaydi.

Ta‘lim jarayonida loyiha ishlari, muammoli vaziyatlar, ijtimoiy loyihalar, ko‘ngillilik faoliyati orqali ijtimoiy mas’uliyatni rivojlantirish mumkin. Bunday faoliyat turlari o‘quvchilarda jamiyat manfaatlarini anglash va ularga hissa qo‘shish istagini shakllantiradi.

Tarbiyaviy ishlar tizimida ijtimoiy mas’uliyat

Tarbiyaviy ishlar ta‘lim jarayonining muhim tarkibiy qismi bo‘lib, u shaxsning axloqiy va ijtimoiy sifatlarini rivojlantirishga qaratilgan. Sinfdan va auditoriyadan tashqari tadbirlar, jamoatchilik ishlari, ijtimoiy loyihalar ijtimoiy mas’uliyatni shakllantirishda katta rol o‘ynaydi.

O‘qituvchi va tarbiyachining shaxsiy namunasi ham bu jarayonda muhim omil hisoblanadi. Chunki shaxs ko‘pincha ijtimoiy xulq-atvorni kuzatish va taqlid qilish orqali o‘zlashtiradi.

Xulosa

Xulosa qilib aytganda, ta‘lim jarayonida ijtimoiy mas’uliyatni shakllantirish shaxs kamolotining muhim sharti hisoblanadi. Ijtimoiy mas’uliyatli shaxs jamiyat taraqqiyotining asosiy omillaridan biridir. Mazkur sifatni shakllantirish ta‘lim jarayonining mazmuni, metodlari va shakllarini to‘g‘ri tashkil etishni talab etadi.

Zamonaviy pedagogik yondashuvlar, xususan kompetensiyaviy va shaxsga yo‘naltirilgan ta‘lim ijtimoiy mas’uliyatni rivojlantirish uchun keng imkoniyatlar yaratadi. Shu bois ta‘lim muassasalarida tarbiyaviy ishlarni tizimli ravishda olib borish, o‘quvchilarning ijtimoiy faolligini qo‘llab-quvvatlash va ularni jamiyat hayotiga faol jalb etish muhim ahamiyat kasb etadi.

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SURGICAL TREATMENT OF HIASOPHAGEAL HERNIAS

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Abstract. Unlike traditional methods, which focus primarily on mechanical suturing of the hernia defect, the developed approach takes into account the severity of axial displacement, cardia geometry, the state of the antireflux valve mechanism, and esophageal motility, allowing for the development of a personalized surgical strategy.

Keywords: Hiatal hernia, surgical treatment.

Relevance. With the increasing surgical activity for hiatal hernia (HH), especially laparoscopic procedures, demands for technical precision, reduction in complications, and prevention of recurrence are increasing (4,7). The availability of high-tech mesh implants, various fundoplication techniques, and flexible esophageal fixation algorithms require a rethinking of the criteria for their use depending on the specific clinical situation (6,8).

The introduction of endovideosurgery in the treatment of esophageal hernias (EHH) has significantly expanded the indications for minimally invasive surgical interventions. Currently, laparoscopic fundoplication (LF) is the procedure of choice in the surgical treatment of gastroesophageal reflux disease (GERD) associated with EHH and ranks second among elective laparoscopic interventions on the gastrointestinal tract (GIT) [1, 18].

To date, more than 100 different surgical procedures have been proposed for the correction of EHH and its complications [17]. This large number of techniques is explained by surgeons' dissatisfaction with both immediate and long-term postoperative results, as well as the need for a differentiated approach to choosing a particular EHH repair technique [2,6]. In recent years, numerous reports have emerged of complications, often uncharacteristic of traditional antireflux surgery. The incidence of early and late postoperative complications varies significantly depending on the surgeon's experience, surgical technique, and the thoroughness of patient monitoring. According to global statistics, their incidence can reach 17% [3,5,9,10]. The most serious complication, often requiring reoperation, is recurrent GERD and

hiatal hernia, which occurs in 5-15% of cases [1,11,12,13,14]. Despite the significant volume of material devoted to this issue, there is no consensus on the diagnosis, prevention, and treatment methods for recurrent gastroesophageal reflux (GER) and failure of antireflux surgery in general. Failure of antireflux surgery is generally defined as recurrent GERD and/or the development of new symptoms associated with anatomical abnormalities of the esophagogastric region [2,15]. Frequent causes of failure include complications such as migration and incarceration of the fundoplication cuff (FC), secondary paraesophageal hernia of the diaphragmatic orifice, "telescope" phenomenon, "hourglass syndrome," as well as postoperative bleeding and perforation of hollow organs [3, 16].

The success rate of repeat surgeries is significantly lower than that of primary surgeries. The success rate of reconstructive procedures ranges from 23% to 89%. Second and third reconstructions traditionally have lower success rates, decreasing to 20% with each subsequent operation [3,]. A thorough analysis of antireflux surgery failures plays a significant role in their prevention. By eliminating the causes of laparoscopic fundoplication errors, the incidence of complications can be significantly reduced [1,18].

The high prevalence and polymorphism of clinical forms of HH, the ongoing controversy surrounding the choice of surgical approach, the insufficient stratification of treatment approaches, and the high rate of unsatisfactory outcomes make research into optimizing the surgical treatment of various forms of HH extremely relevant and in demand (1,2,3,5,8). This research is consistent with the priority areas of development in abdominal surgery, addresses the objectives of reducing disability and improving quality of life for patients, and also creates the preconditions for the standardization and personalization of surgical care in this area.

The objective of the study was to develop a modified surgical method for the treatment of esophageal hernias.

Materials and Methods. In accordance with the study methodology, patients were divided into two groups: a control group (63 patients; 49.2%), operated on between 2015 and 2019 using a traditional technique (posterior cruroraphy and, in some cases, Nissen fundoplication); and a study group (65 patients; 50.8%), who underwent surgery between 2020 and 2025 using a modified technique and an algorithmically based choice of the intervention scope.

Results and Discussion. This study presents a modified surgical technique developed by us, aimed at eliminating not only the anatomical defect but also stabilizing the key functional elements of the hernia. Furthermore, we formulate principles and propose an algorithm for its application, taking into account the severity of axial displacement,

motor impairments, anatomical geometry, and compensatory mechanisms identified during preoperative examination.

High correlation coefficients were also observed with increasing gastric migration ($r=0.612$), Hill valve dysfunction ($r=0.578$), and the presence of pathological acid exposure in the distal esophagus ($r=0.604$).

Barrett hernia type also showed a significant correlation ($r=0.531$), particularly with the transition from types I-II to III-IV. These data indicate that anatomical and functional abnormalities of the esophageal motility have predictive value for an unfavorable postoperative course and can be used as a basis for choosing an extended or modified surgical intervention.

Results and Discussion. This study presents a modified surgical technique developed by us, aimed at eliminating not only the anatomical defect but also stabilizing the key functional elements of the hernia. Furthermore, we formulate principles and propose an algorithm for its application, taking into account the severity of axial displacement, motor impairments, anatomical geometry, and compensatory mechanisms identified during preoperative examination.

To objectively identify the causes of unsatisfactory results of standard surgical correction for hiatal hernia, a correlation analysis was conducted to determine the relationship between the anatomical and functional characteristics of the hernia and the recurrence rate at long-term follow-up. This approach avoided subjective interpretation and moved from isolated observations to statistically confirmed relationships. The analysis included parameters are obtained preoperatively using a comprehensive instrumental assessment, namely, EGDFS, CT, manometry, pH-metry, as well as clarification of the hernia type according to the Barrett and Hill classifications (Figure 1). The strongest correlation with the 12-month recurrence rate was found for esophageal motility disorders ($r=0.665$), highlighting the importance of assessing peristaltic activity when choosing the extent of surgery.

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International practice shows that despite the widespread prevalence of posterior crurorraphy, the recurrence rate after standard intervention remains significant,

especially in mixed forms of posterior hernia and in patients with severe diaphragmatic dysfunction. Attempts to supplement cruroraphy with gastropexy or use mesh implants have often lacked systematic justification for the extent of the intervention depending on the specific morphological type of hernia. In this context, the proposed technique is distinguished by its comprehensive structure and functional selectivity of its components.

The advantages of the proposed modified technique can be summarized as follows:

- pathogenetic focus, where each stage of the intervention is correlated with the specific mechanism of posterior hernia formation: cruroraphy with subalarcotic sutures to stabilize the diaphragmatic orifice; gastropexy to prevent cranial displacement of the cardia; and a "saddle" implant to strengthen the area against the background of reduced tissue resistance.
- biomechanical stability of the resulting complex: the use of sutures that distribute the load along an arcuate trajectory eliminates linear tension, reducing the risk of dehiscence and recanalization; the mesh implant does not circumferentially occlude the esophagus, minimizing the risk of dysphagia and cicatricial deformity.
- personalization of the intervention: the technique is not dogmatic, and its elements are applied differentially, depending on the type of hernia, the degree of gastric displacement, and the severity of functional impairment, ensuring flexibility of the approach.
- technological reproducibility: all manipulations can be performed using a standard laparoscopic approach, without the use of expensive or scarce materials; the technique is easily adapted to the technical conditions of a general surgical department.

Thus, the modified procedure represents a clinically justified and anatomically adapted treatment method capable of restoring the physiological parameters of the esophageal septum.

CONCLUSIONS:

1. The main reasons for the unsatisfactory results of traditional surgical treatments for esophageal hernias are the failure to consider the morphofunctional characteristics of the disease and the use of a standardized approach regardless of hernia type, degree of migration, or valve mechanism status.
2. Unlike traditional methods, which focus primarily on mechanical suturing of the hernia defect, the developed approach takes into account the severity of axial displacement, cardia geometry, the state of the antireflux valve mechanism, and esophageal motility, enabling the development of a personalized surgical approach.

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YASHIL IQTISODIYOT SHAROITIDA TEXNOLOGIK RIVOJLANISHNING NAZARIY KONSEPSIYALARI

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Annotatsiya

Mazkur maqolada yashil iqtisodiyot sharoitida texnologik rivojlanishning nazariy asoslari, ekologik barqarorlikni ta'minlashda innovatsion texnologiyalarning o'rni hamda ularning iqtisodiy o'sishga ta'siri yoritilgan. Shuningdek, yashil texnologiyalarning asosiy yo'nalishlari, ularning iqtisodiy va ekologik samaradorligi jadval va grafiklar asosida tahlil qilingan.

***Kalit so'zlar:** yashil iqtisodiyot, yashil texnologiyalar, barqaror rivojlanish, innovatsiya, ekologik samaradorlik.*

Kirish

Hozirgi globalashuv sharoitida iqtisodiy rivojlanishni ekologik muvozanatni saqlagan holda ta'minlash dolzarb masalaga aylandi. An'anaviy iqtisodiy model resurslarning haddan tashqari sarflanishi va atrof-muhitga salbiy ta'sir bilan tavsiflanar ekan, yashil iqtisodiyot konsepsiyasi ushbu muammolarga muqobil yechim sifatida shakllanmoqda. Bu jarayonda yashil texnologiyalar iqtisodiy o'sishning muhim omili hisoblanadi.

Yashil iqtisodiyot va texnologik rivojlanishning nazariy asoslari

Yashil iqtisodiyot – bu iqtisodiy o'sish bilan bir qatorda ekologik barqarorlik va ijtimoiy adolatni ta'minlashga qaratilgan rivojlanish modelidir. Ushbu modelda texnologik rivojlanish quyidagi nazariy konsepsiyalarga asoslanadi:

- resurslardan samarali foydalanish;
- qayta tiklanuvchi energiya manbalarini joriy etish;
- ekologik xavfsiz ishlab chiqarish texnologiyalarini rivojlantirish;
- innovatsion va raqamli yechimlardan foydalanish.

Yashil texnologiyalarning asosiy yo'nalishlari va ularning iqtisodiy ta'siri quyidagicha:

1. **Qayta tiklanuvchi energiya:** Ushbu yo‘nalish quyosh, shamol, gidroenergiya kabi tabiiy manbalardan energiya ishlab chiqarishga qaratilgan. U energiya xarajatlarini kamaytiradi, import qilinadigan yoqilg‘i hajmini qisqartiradi va uzoq muddatli iqtisodiy samaradorlikni ta‘minlaydi.
2. **Energiya tejamkor texnologiyalar:** Kam energiya sarf qiluvchi uskunalar va ishlab chiqarish jarayonlari ushbu yo‘nalishga kiradi. Natijada ishlab chiqarish tannarxi pasayadi va energiya resurslaridan samarali foydalanish kuchayadi.
3. **Chiqindilarni qayta ishlash:** Iste‘mol va ishlab chiqarish chiqindilarini qayta ishlash orqali ikkinchi darajali resurslar hosil qilinadi. Bu nafaqat chiqindilarni utilizatsiya qilish xarajatlarini kamaytiradi, balki qo‘shimcha daromad manbai yaratadi.
4. **Ekologik transport:** Elektromobillar va boshqa kam ifloslantiruvchi transport vositalari ushbu yo‘nalishga kiradi. Ular yoqilg‘i importini kamaytiradi, transport xarajatlarini pasaytiradi va atrof-muhitni ifloslantirishni kamaytiradi.

1-jadval

Yashil texnologiyalarning asosiy yo‘nalishlari va ularning iqtisodiy ta‘siri

Yashil texnologiya yo‘nalishlari	Asosiy mazmuni	Iqtisodiy samarasi
Qayta tiklanuvchi energiya	Quyosh, shamol, gidroenergiya	Energiya xarajatlarining kamayishi
Energiya tejamkor texnologiyalar	Kam energiya sarf qiluvchi uskunalar	Ishlab chiqarish tannarxining pasayishi
Chiqindilarni qayta ishlash	Ikki marotaba foydalanish	Qo‘shimcha daromad manbai
Ekologik transport	Elektromobillar	Yonilg‘i importining qisqarishi

Ushbu jadvaldan ko‘rinib turibdiki, yashil texnologiyalar nafaqat ekologik, balki iqtisodiy samaradorlikni oshirishda muhim rol o‘ynaydi. Har bir yo‘nalish quyidagi jihatlarga hissa qo‘shadi:

- **Energiya samaradorligi:** Qayta tiklanuvchi energiya va energiya tejamkor texnologiyalar energiya xarajatlarini sezilarli darajada kamaytiradi. Bu ishlab chiqarish tannarxini pasaytiradi va iqtisodiy samaradorlikni oshiradi.

- **Resurslarni tejash va daromad manbai yaratish:** Chiqindilarni qayta ishlash iqtisodiy jihatdan qo‘shimcha daromad manbai bo‘lib xizmat qiladi va resurslardan samarali foydalanishni rag‘batlantiradi.
- **Barqaror transport tizimi:** Ekologik transport yoqilg‘i xarajatlarini kamaytiradi, importga bo‘lgan ehtiyojni pasaytiradi va atrof-muhitni himoya qiladi.

Texnologik rivojlanishning yashil iqtisodiyotdagi roli

Yashil texnologiyalarni joriy etish iqtisodiy o‘shishni sekinlashtirmaydi, aksincha, uzoq muddatli barqaror rivojlanishni ta‘minlaydi. Ular ishlab chiqarish samaradorligini oshiradi, yangi ish o‘rinlari yaratadi va innovatsion muhitni shakllantiradi.

An‘anaviy texnologiyalar yuqori darajada resurs talab qiladi, ya‘ni ishlab chiqarish jarayonida energiya, xomashyo va suv kabi tabiiy resurslar ko‘p sarflanadi. Shu bilan birga, yashil texnologiyalar resurslardan samarali foydalanadi va chiqindilarni kamaytiradi. Bu esa iqtisodiy tejamkorlikni oshiradi va uzoq muddatli barqaror rivojlanishga hissa qo‘shadi.

An‘anaviy texnologiyalar atrof-muhitga salbiy ta‘sir ko‘rsatadi: havo va suv ifloslanishi, chiqindilar miqdorining oshishi va karbon chiqindilarining ko‘payishi kuzatiladi. Yashil texnologiyalar esa ekologik ta‘siri minimal bo‘lib, tabiiy muhitni himoya qiladi, karbon izini kamaytiradi va atrof-muhitni barqaror rivojlantirishga yordam beradi.

An‘anaviy texnologiyalar qisqa muddatda iqtisodiy foyda berishi mumkin, lekin uzoq muddatli samaradorlik past bo‘ladi, chunki resurslar tez tugaydi va atrof-muhitga zarar yetadi. Yashil texnologiyalar esa uzoq muddatli samaradorlikni ta‘minlaydi: energiya xarajatlarini kamaytiradi, ishlab chiqarish tannarxini pasaytiradi va ekologik xavfsizlikni oshiradi.

An‘anaviy texnologiyalar odatda cheklangan innovatsion imkoniyatlarga ega bo‘lib, mavjud ishlab chiqarish tizimlariga moslashgan. Yashil texnologiyalar esa yuqori darajada innovatsion bo‘lib, yangi energiya manbalari, raqamli boshqaruv tizimlari, ekologik transport va chiqindilarni qayta ishlash kabi ilg‘or yechimlarni o‘z ichiga oladi. Bu esa iqtisodiy va ekologik jihatdan uzoq muddatli barqaror rivojlanishni ta‘minlaydi.

2-jadval

Yashil va an‘anaviy texnologiyalarni solishtirma tahlili

Ko‘rsatkichlar	An‘anaviy texnologiyalar	Yashil texnologiyalar
Resurs sarfi	Yuqori	Past

Ko'rsatkichlar	An'anaviy texnologiyalar	Yashil texnologiyalar
Ekologik ta'sir	Salbiy	Minimal
Uzoq muddatli samaradorlik	Past	Yuqori
Innovatsionlik darajasi	Cheklangan	Yuqori

Jadval va tahlil shuni ko'rsatadiki, yashil texnologiyalar an'anaviy texnologiyalarga nisbatan bir qancha ustunliklarga ega:

- resurslardan samarali foydalanish;
- ekologik ta'sirning minimal bo'lishi;
- uzoq muddatli samaradorlikni oshirish;
- innovatsionlik darajasining yuqoriligi.

Shu sababli, iqtisodiy o'sish va barqaror rivojlanishni ta'minlash maqsadida yashil texnologiyalarni joriy etish davlat siyosatida va ishlab chiqarish strategiyalarida ustuvor yo'nalish sifatida qabul qilinishi zarur.

3-jadval.

O'zbekiston Respublikasida qayta tiklanuvchi energiya va yashil investitsiyalar bo'yicha statistik ko'rsatkichlar (2023–2025)

Ko'rsatkichlar	2023	2024	2025 (Prognoz)
✓ Qayta tiklanuvchi energiya ishlab chiqarish, mlrd kWh	~4,3 (2023)	~5,0-5,7 (2024)	~23 (prognoz bo'yicha)
✓ Qayta tiklanuvchi energiya quvvati (MW) amalga oshirilgan	~4 300 MW	~5 000 MW (sohada amalga oshirilmoqda)	Maqsad: ~17 000–20 000 MW (2030 maqsadi)
✓ Yil davomida gaz tejash (mlrd m ³)	~1,3	~<1 (hisoblar asosida)	—
✓ CO ₂ chiqindilarini kamaytirish (mln tonna)	~1,8	—	—
✓ Xorijiy investitsiyalar (qayta tiklanuvchi sektor)	~\$1,3 mlrd (2023)	~\$4,6 mlrd (2024)	—

Ko'rsatkichlar	2023	2024	2025 (Prognoz)
✓ Green Energy sektoriga jalb qilingan investitsiyalar umumiy qiymati	—	~\$30 mlrd (energiya sohasida)	—

O'zbekiston misolida yashil texnologiyalar va qayta tiklanuvchi energiya rivojlanishining statistik tahlili

Jadval ma'lumotlariga ko'ra, O'zbekiston Respublikasida 2023–2025-yillar davomida yashil iqtisodiyot yo'nalishida texnologik rivojlanish sezilarli sur'atlar bilan amalga oshirilmoqda. Shu tahlil orqali asosiy tendensiyalarni aniqlash mumkin.

1. Qayta tiklanuvchi energiya ishlab chiqarishining o'sishi

2023-yilda O'zbekistonda qayta tiklanuvchi energiya ishlab chiqarish hajmi 4,3 mlrd kWh ni tashkil qilgan bo'lsa, 2024-yilda bu ko'rsatkich 5,0–5,7 mlrd kWh gacha oshgan. 2025-yilda esa prognoz qilingan 23 mlrd kWh energiya ishlab chiqarilishi mamlakatda qayta tiklanuvchi energiya manbalarining iqtisodiy salohiyatini sezilarli darajada oshirishni ko'rsatadi.

Ushbu o'sish darajasi yashil texnologiyalarning iqtisodiy integratsiyasi va energiya balansini diversifikatsiya qilishga qaratilgan strategik choralarning samaradorligini ko'rsatadi.

2. Qayta tiklanuvchi energiya quvvati va investitsiyalar

Qayta tiklanuvchi energiya quvvati 2023-yilda 4 300 MW dan 2024-yilda 5 000 MW ga yetgan. Bu quvvat 2025-yilga kelib 17 000–20 000 MW gacha oshirilishi rejalashtirilgan. Shu bilan birga, green energy sektorga jalb qilingan xorijiy investitsiyalar 2023-yilda \$1,3 mlrd bo'lsa, 2024-yilda \$4,6 mlrd ga yetgan.

Bu o'sish investitsion muhitning yaxshilanganini, shuningdek, davlat va xususiy sektor hamkorligining kuchayganini ko'rsatadi. Yashil texnologiyalarga jalb qilingan katta miqdordagi investitsiyalar uzoq muddatli iqtisodiy foyda va ish o'rinlari yaratishga xizmat qiladi.

3. Energiya tejash va ekologik samaradorlik

Yashil texnologiyalarni qo'llash orqali 2023-yilda tabiiy gaz tejash 1,3 mlrd m³ ni tashkil qilgan. Shuningdek, CO₂ chiqindilarini kamaytirish 1,8 mln tonna atrofida baholangan.

Bu ko'rsatkichlar yashil texnologiyalarning atrof-muhitni himoya qilish va iqtisodiy samaradorlikni oshirish bo'yicha real salohiyatini tasdiqlaydi. Shu bilan birga, energiya sarfini kamaytirish ishlab chiqarish tannarxini pasaytiradi va resurslardan samarali foydalanishni rag'batlantiradi.

4. Yashil iqtisodiyotning uzoq muddatli ijtimoiy va iqtisodiy ta'siri

Yashil texnologiyalarni joriy etish natijasida yangi ish o'rinlari yaratiladi, eksport salohiyati oshadi va innovatsion iqtisodiy muhit shakllanadi. Jadvaldagi investitsiyalar hajmi va ishlab chiqarish quvvati o'sishi shuni ko'rsatadiki, O'zbekiston yashil iqtisodiyot strategiyasini izchil amalga oshirmoqda.

Statistik ma'lumotlar asosida quyidagilarni aytish mumkin: mamlakatda yashil texnologiyalarga investitsiya qilish nafaqat ekologik muammolarni kamaytiradi, balki iqtisodiy o'sish va barqaror rivojlanishga sezilarli ta'sir qiladi.

Tahlillar shuni ko'rsatadiki, yashil iqtisodiyot sharoitida texnologik rivojlanish nazariy jihatdan iqtisodiy o'sish, ekologik barqarorlik va ijtimoiy farovonlikni uyg'unlashtiradi. Yashil texnologiyalarni joriy etish nafaqat ekologik muammolarni kamaytiradi, balki milliy iqtisodiyot raqobatbardoshligini oshiradi. Shu sababli, davlat va xususiy sektor tomonidan yashil innovatsiyalarni qo'llab-quvvatlash ustuvor vazifa bo'lib qolmoqda.

1. O'zbekiston qayta tiklanuvchi energiya va green energy sektorini rivojlantirish bo'yicha aniq strategik natijalarga erishmoqda.

2. Qayta tiklanuvchi energiya ishlab chiqarish va quvvatining sezilarli o'sishi iqtisodiy va ekologik foydani oshiradi.

3. Yashil texnologiyalarni qo'llash investitsion faollikni oshirish, ish o'rinlari yaratish va atrof-muhitni himoya qilishga xizmat qilmoqda.

Shu bilan birga, kelajakda investitsiyalarni yanada samarali boshqarish, texnologik yangilanishni tezlashtirish va hududlar bo'yicha balansni ta'minlash zarur.

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БОШ МИЯ ЁПИҚ ЖАРОХАТЛАРИДА БУЙРАК УСТИ БЕЗИНИНГ ПАТОЛОГИК АНАТОМИЯСИ

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Мавзунинг долзарблиги: Бош миya ёпиқ жароҳатлари (БМЁЖ) бугунги кунда тиббиёт амалиётида энг кўп учрайдиган ва юқори ўлим кўрсаткичи ҳамда асорати сифатида ногиронликка олиб келувчи ҳолатлардан бири бўлиб, ушбу жароҳатлар нафақат бош миya марказий нерв тизими, балки нейроэндокрин тизим фаолиятининг жиддий бузилиши билан кечадиан касалликдир. Умуман олганда стресс-реакцияларнинг асосий эффектор аъзоси бўлган буйрак усти беzi бош миya шикастланишларида функционал ва морфологик ўзгаришларга учрайди. Бунинг натижасида, БМЁЖда буйрак усти безининг патологоанатомик хусусиятларини ўрганиш муҳим илмий ва амалий аҳамиятга эга ҳисобланади.

Ишнинг мақсади: Бош миya ёпиқ жароҳатларида буйрак усти беziда юзага келадиган макроскопик ва микроскопик жихатдан патологоанатомик ўзгаришларни аниқлаш ҳамда унинг натижасида стресс-реакцияларининг морфологик ифодаси сифатида баҳолаш.

Олинган натижалар: Олиб борилган кекширувлар натижасида буйрак усти беziда қон билан тўлишиш, стромал шишлар, микрогеморрагиялар ва қон томирлар деворининг ўтказувчанлиги хаддан ташқари ошгани аниқланди. Шунингдек, буйрак Қобик моддасида, айниқса *zona fasciculata*да, адренкортикоцитларнинг гипертрофияси, вакуолизация, липид захираларининг камайиши ҳамда дистрофик ўзгаришлар кузатилди. *Zona reticularis*да хужайралар дезорганизацияси белгилари қайд этилди. Медулляр қаватда эса хромаффин хужайраларнинг функционал зўриқиши ва секретор фаоллик ошганлигига хос морфологик белгилар аниқланди.

Хулосалар: хулоса ўрнида шуни айтиш мумкинки, бош миya ёпиқ жароҳатларида буйрак усти беziда ривожланадиган патологоанатомик ўзгаришлар умуман олганда, организмдаги кучли стресс-реакция ва гипоталамо-гипофизар–буйрак усти беzi ўқининг фаоллашуви билан боғлиқ ҳисобланади. Аниқланган морфологик ўзгаришлар БМЁЖ оғирлик даражасини баҳолаш, асоратларни олдиндан башорат қилиш ва комплекс даволаш тактикасини такомиллаштиришда муҳим аҳамият касб этади.

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DIAGNOSTIC CRITERIA AND A PROGNOSTIC MODEL FOR THE COURSE OF SOFT TISSUE NECROBIOTIC INFECTIONS IN DIABETES PATIENTS BASED ON ARTIFICIAL INTELLIGENCE

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Abstract. Expanding the model using artificial intelligence technologies has transformed the scale into a dynamic system adaptable to the characteristics of each patient and based on a wide array of accumulated data.

Keywords: necrotizing soft tissue infections, prognosis, diabetes mellitus, artificial intelligence

Relevance. According to the Surgical Infection Society of North America (SISNA), 30-day mortality from severe forms of NSTI against the background of severe comorbid diseases reaches approximately 18-22%, and the annual mortality exceeds 30%, which emphasizes the severity of the pathology and the significant burden on healthcare systems (1,3,5,7). Diabetes mellitus is the most common endocrine disease in the world, competing for third place after cardiovascular diseases and oncological diseases (20). Its prevalence among the adult population reaches 7-9% of the entire population of the Earth (19). According to the World Health Organization, there are 347 million patients with diabetes mellitus in the world (2,6,8,10). While 17.9 million patients are diagnosed with diabetes mellitus (DM), 5.7 million worldwide are unaware of their diagnosis, in more than 50% of cases DM is diagnosed late (4,9,10,11,12,.13). The most typical surgical complications in patients with diabetes are purulent-inflammatory diseases of soft tissues. Changes in cellular and humoral immunity significantly affect the course of the wound healing process, prolonging both its phases: the healing process is delayed for weeks and even months (5,14,15,16). The solution to these problems is becoming increasingly important socio-economically (1,17,18). According to the literature, patients with type 2 diabetes mellitus exhibit high levels of proinflammatory cytokines in the blood serum, which affects the functional state of fibroblasts and keratinocytes, as well as the dynamics and duration of the inflammatory process (1). However, the regulation of the wound healing process mediated by intercellular interactions, including the participation of connexins and growth factor receptors, remains poorly understood.

The search for prognostic criteria, optimization of the extent of surgical intervention, and the integration of modern methods of local intervention can significantly improve treatment outcomes, reduce the incidence of amputations and mortality, and ensure a more rational use of healthcare resources.

Study objective: to develop diagnostic criteria and a prognostic model for the course of the necrobiotic process of soft tissues in patients with diabetes mellitus based on artificial intelligence.

Materials and methods. The clinical material consisted of 128 patients with diabetes mellitus who underwent treatment and examination for severe forms of NSTI at a multidisciplinary medical center in the Bukhara region from 2016 to 2025. In accordance with the goals and objectives of the study, all patients were divided into two groups: the control group included 63 patients treated in 2016-2020,

when the tactics for necrotizing lesions were built according to the traditional scheme; The main group included 65 patients observed between 2021 and 2025, using the comprehensive LDA we developed.

Results and discussion. The "PIN-SD" scale (Prognostic Index of Necrobiosis in Diabetes Mellitus) we developed combines key cytological and rapid microbiological indicators that reflect the intensity of the necrobiotic process in patients with diabetes and severe forms of NIMT. Each of the 7 indicators has 3 severity levels and is scored from 0 to 2 points, allowing us to identify both early deviations corresponding to the initial phases of necrobiosis and signs of deep destruction that pose a significant risk of progression to purulent-necrotic disease. The resulting indicator reflects the overall degree of disruption of the cellular and microbial balance and serves as the basis for predicting potential developmental dynamics. The scale is designed so that the minimum score is zero, which corresponds to a favorable cytological and microbiological picture and the absence of signs of active destruction. The maximum value of 14 points reflects the extreme severity of changes, at which the tissue structure becomes unstable and the microbial profile is mixed and aggressive. Intermediate values are distributed evenly and create a moderate-risk range, which is most often encountered in clinical practice and requires careful dynamic monitoring. For ease of clinical interpretation, three levels of the total score are provided. Values ≤ 3 points are associated with a low probability of process progression. The range from 4 to 10 points reflects a moderate level of risk. In this range, a borderline state develops, in which local defense mechanisms remain active, but microbial pressure and cellular destruction have already noticeably increased. Values ≥ 11 points are considered high and indicate a significant shift of all pathogenic elements toward profound destruction.

Combining cytological, microbiological, and clinical characteristics into a single framework opened the possibility of using them not only for manual risk assessment but also for building an intelligent model capable of comparing individual cases with the accumulated data set. This approach became a logical extension of work on the scale and led to the development of the PIN-SD-AI program, which integrates these criteria into an automated process for generating a prognosis and selecting optimal patient management strategies.

The PIN-SD-AI technology is based on the step-by-step integration of various data reflecting the condition of soft tissues in severe forms of NIMT in patients with diabetes. The program is designed so that the physician can consistently enter the initial information, avoiding unnecessary time spent on complex calculations and comparisons. After entering the initial data, the physician proceeds to enter the express indicators obtained during the initial examination of the wound. The physician enters the values of four cytological indices that most fully reflect the cellular changes in the affected area. Express bacterioscopy smear parameters are entered simultaneously. The physician specifies the microbial density, the ratio of Gram-negative to Gram-positive flora, and the proportion of polymicrobial complexes. The expanded set includes parameters typically available only through in-depth laboratory analysis. Integration of such data allows the algorithm to compare the current wound with previously observed patterns and identify more subtle differences between patients. At the same time, the basic version of the program remains applicable even when using only express methods. Once the data is entered, the program creates an integrated patient profile, creating a necrobiotic process phenotype that integrates cellular, microbiological, and clinical components. This comparison mechanism provides the basis for prognostication, as the AI analyzes not individual parameters, but the structure of relationships between them.

The central element of the program is the AI analytical module, which compares the entered patient data with a wide range of previously registered cases. The model is trained on combinations of parameters characterizing different types of necrobiosis progression, allowing it to identify similarities between the current situation and clinical cases in the database. Based on these comparisons, a prediction is made regarding the likelihood of the process progressing to a more severe phase. The module assesses the risk of progression in the coming hours and days, taking into account the overall "PIN-SD" score, a combination of rapid indicators, cellular response characteristics, and the microbial landscape.

After processing the information, the program generates a final report, accessible to the physician directly in the interface. The initial display is the total score on the PIN-SD scale and the patient's classification into one of three risk groups. Depending on the phenotype and risk level, the prognostic algorithm may indicate the need for surgical intervention, extended necrosectomy, or preparation for possible amputation if the lesion is widespread and necrobiosis is progressing rapidly. The final step of the program is storing patient data and monitoring results. This architecture makes PIN-SD-AI more than just a scoring tool, but a fully-fledged assistant that integrates a visual image of the wound, rapid methods, and elements of in-depth research into a single prognostic framework. Such a program can compensate for the shortcomings of subjective assessment and provide the physician with a quantitatively substantiated prediction of the further course of the necrobiotic process. The results of the study demonstrate that the combination of cytological indices and rapid microbiological indicators enables the development of a reliable set of criteria that reflect the key mechanisms of necrobiotic development in NIMT in patients with diabetes. Based on these criteria, the "PIN-DM" scale was developed, which combines the most significant elements of cellular and microbial imbalance and demonstrates high accuracy in predicting the likelihood of severe disease progression. Further expansion of the model using AI technologies enabled the scale to be transformed into a dynamic system adaptable to the characteristics of each patient and based on a wide array of accumulated data. The resulting structure ensures robust differentiation between disease progression variants and forms the basis for the development of comprehensive clinical diagnostic and treatment algorithms.

CONCLUSIONS

1. The combination of cytological indices and rapid microbiological indicators enables the development of a reliable set of criteria that reflect the key mechanisms of necrobiotic development in NIMT in patients with diabetes.
2. Expanding the model using AI technologies enabled the scale to be transformed into a dynamic system adaptable to the characteristics of each patient and based on a wide array of accumulated data. The resulting structure ensures stable differentiation of disease course variants and creates the basis for the development of comprehensive clinical treatment and diagnostic algorithms.

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ALISHER NAVOIY “LISON UT-TAYR” ASARIDA KOMIL INSON G‘OYASINING BADIY-FALSAFIY ASOSLARI

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Annotatsiya

Mazkur ilmiy maqolada Alisher Navoiyning “Lison ut-tayr” asarida komil inson g‘oyasining badiiy-falsafiy asoslari tahlil qilinadi. Asarda tasavvufiy tafakkur, ilohiy ishq, nafsni poklash va ruhiy kamolot bosqichlari ramziy obrazlar orqali yoritilgan. Qushlar sayohati misolida komil inson sifatlari – sabr, tavba, ma’rifat, ishq, fano va baqo tushunchalari ochib beriladi. Tadqiqotda Navoiyning komil inson haqidagi qarashlari Sharq tasavvufiy-falsafiy an’analari bilan uzviy bog‘liqlikda yoritiladi.

Kalit so‘zlar: Lison ut-tayr, Alisher Navoiy, komil inson, tasavvuf, ilohiy ishq, ramz.

Аннотация

В статье анализируются художественно-философские основы идеи совершенного человека в произведении Алишера Навои «Лисон ут-тайр». Через суфийскую символику раскрываются этапы духовного совершенствования личности, очищение нafsа и путь к Божественной истине. Образы птиц интерпретируются как носители качеств совершенного человека. **Ключевые слова:** Лисон ут-тайр, Навои, совершенный человек, суфизм, символ.

Annotation

This article analyzes the artistic and philosophical foundations of the idea of the perfect human being in Alisher Navoi’s “Lison ut-Tayr”. Through Sufi symbolism, the stages of spiritual perfection, purification of the ego, and the journey toward divine truth are explored. Bird imagery represents the qualities of the perfect human.

Keywords: Lison ut-Tayr, Alisher Navoi, perfect human, Sufism, symbolism.

KIRISH

Alisher Navoiy ijodida komil inson g‘oyasi markaziy o‘rin egallaydi. Uning asarlarida insonning axloqiy, ruhiy va ma’naviy kamoloti tasavvufiy falsafa asosida yoritiladi. “Lison ut-tayr” dostoni bu g‘oyaning eng mukammal badiiy ifodalaridan biri bo‘lib, unda insonning ilohiy haqiqat sari intilishi ramziy syujet asosida tasvirlanadi. Mazkur maqolaning maqsadi asarda komil inson g‘oyasining badiiy-falsafiy asoslarini ilmiy jihatdan tahlil qilishdan iborat.

Asosiy qism

Komil inson g'oyasining Sharq falsafasi va tasavvufdagi ildizlari Komil inson tushunchasi Sharq falsafasi va islomiy tasavvufda markaziy konsepsiyalardan biri hisoblanadi. Ushbu tushuncha Qur'oni karim, hadislar hamda tasavvufiy-falsafiy manbalarda insonning ma'naviy barkamolligi, axloqiy yetukligi va ilohiy haqiqatga yaqinlashuvi bilan bog'liq holda talqin etiladi. Tasavvufda komil inson Allohning jamol va kamol sifatlarini o'zida mujassam etgan, nafsni yengib, ruhiy poklanish yo'lidan o'tgan shaxs sifatida e'tirof etiladi. Alisher Navoiy ana shu falsafiy an'analarni chuqur o'zlashtirgan holda, ularni "Lison ut-tayr" asarida yuksak badiiy darajada ifodalaydi.

Navoiy talqinidagi komil inson faqatgina diniy-ma'rifiy timsol bo'lib qolmay, balki real hayotda axloqiy mezon sifatida ham namoyon bo'ladi. Shoir insonni jamiyatda adolatli, halol, sabrli va ma'rifatli bo'lishga undaydi. Shu bois komil inson g'oyasi asarda ijtimoiy-falsafiy ahamiyat kasb etadi.

"Lison ut-tayr" syujeti va komil inson konsepsiyasi Asar syujeti qushlarning Simurg'ni izlab safarga chiqishi asosiga qurilgan bo'lib, bu safar insonning o'zini anglash va komillikka erishish yo'lini ramziy ifodalaydi. Har bir qush o'z ichki holati, zaifligi yoki fazilati bilan ajralib turadi. Ularning bahs-munozaralari, yo'ldagi ikkilanmalari inson ruhiy dunyosidagi kechinmalarni ifodalaydi.

Navoiy ushbu syujet orqali komil inson bo'lish oson emasligini, bu yo'l mashaqqatli va sinovlarga boy ekanini ko'rsatadi. Faqat sabr, iroda va ilohiy ishqa sodiqlik bilangina inson ushbu yo'ldan muvaffaqiyatli o'ta oladi. Bu esa asarning falsafiy qatlamini yanada chuqurlashtiradi.

Hudhud obrazi – komil inson sari yetaklovchi murshid Hudhud qushi "Lison ut-tayr"da markaziy obrazlardan biri bo'lib, murshid, ya'ni ruhiy yetakchi vazifasini bajaradi. Tasavvufda murshid komil inson sari yetaklovchi, shogirdni nafs balosidan asrovchi va unga to'g'ri yo'l ko'rsatuvchi shaxsdir. Hudhudning qushlarga qilgan nasihatlarini, ularni ruhlantirishi va yo'lga undashi bu obrazning falsafiy ahamiyatini oshiradi.

Navoiy Hudhud orqali ilm, hikmat, sabr va fidoyilik sifatlarini ulug'laydi. Hudhud komil insonning o'zida mavjud bo'lishi lozim bo'lgan eng muhim fazilatlarni mujassamlashtirgan timsoldir.

Nafs bilan kurash va komil inson shakllanishi Asarda nafs insonni komillikdan to'suvchi asosiy omil sifatida talqin etiladi. Qushlarning yo'lga chiqishdan bosh tortishi, bahonalar topishi yoki ortga qaytishga urinishi nafsning turli ko'rinishlarini ifodalaydi. Navoiy nafsni yengish jarayonini murakkab va davomli jarayon sifatida ko'rsatadi.

Komil inson bo‘lish uchun nafsiy istaklardan voz kechish, dunyoviy manfaatlardan ustun turish talab etiladi. Bu g‘oya tasavvufiy axloqning asosiy tamoyillaridan biri bo‘lib, “Lison ut-tayr”da badiiy ramzlar orqali mukammal ochib berilgan.

Yettita vodiya va komillik bosqichlarining falsafiy talqini Asarda keltirilgan yetti vodiya komil inson shakllanishining izchil bosqichlarini ifodalaydi. Talab vodiysi insonda maqsad va intilishni uyg‘otadi. Ishq vodiysida ilohiy muhabbat ustuvor bo‘lib, inson o‘z “men”idan kecha boshlaydi. Ma’rifat vodiysi aql va idrokning yuksalishini anglatadi.

Istiqno vodiysida dunyoviy bog‘liqlikdan xalos bo‘lish, Tavhid vodiysida yagona haqiqatni anglash, Hayrat vodiysida ilohiy sirlar qarshisida ojizlikni tan olish namoyon bo‘ladi. Fano vodiysi esa komil insonning eng yuqori bosqichi bo‘lib, unda inson o‘zligini yo‘qotib, ilohiy haqiqat bilan birlashadi.

Simurg‘ obrazi va komil inson idealining badiiy-falsafiy talqini Simurg‘ obrazi “Lison ut-tayr”da komil inson idealining ramziy ifodasi hisoblanadi. Qushlar uzoq va mashaqqatli safardan so‘ng Simurg‘ni izlab topganlarida, uning aslida o‘zlarining jamlanmasi ekanini anglaydilar. Bu holat komillik tashqi kuch emas, balki insonning o‘zida mavjud ekanini anglatadi.

Navoiy ushbu g‘oya orqali insonni o‘zini anglashga, ichki dunyosini poklashga va ilohiy haqiqatni qalb orqali topishga chorlaydi. Simurg‘ timsoli tasavvufiy falsafadagi vahdat ul-vujud konsepsiyasi bilan bevosita bog‘liq bo‘lib, asarning g‘oyaviy cho‘qqisini tashkil etadi.

Komil inson g‘oyasining axloqiy va ijtimoiy ahamiyati “Lison ut-tayr”dagi komil inson g‘oyasi nafaqat tasavvufiy, balki axloqiy va ijtimoiy ahamiyatga ham ega. Navoiy komil inson timsolida jamiyatni adolat, halollik va ma’rifat asosida rivojlantirish g‘oyasini ilgari suradi. Ushbu qarashlar bugungi kunda ham o‘z ahamiyatini yo‘qotmagan.

Xulosa

“Lison ut-tayr” asarida komil inson g‘oyasi tasavvufiy ramzlar orqali yuksak badiiy-falsafiy darajada ifodalangan. Navoiy ushbu asari bilan insonni axloqiy poklanish, ma’naviy kamolot va ilohiy haqiqat sari chorlaydi.

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THE DEGREE OF INJURY OF THE PAPHYRACUTUS IN CLOSED BRAIN INJURIES

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Relevance of the topic: Today, in modern medicine, one of the diseases that causes high mortality and disability is closed brain injury. In general, against the background of damage to the central nervous system, secondary functional and morphological changes can develop in internal organs, including the pancreas. As a result of neuroendocrine and vegetative disorders, stress-hormonal effects, microcirculation in the body, increase the risk of pancreatic damage. Therefore, the study of the incidence of pancreatic pathology in BMYoJs is important in the field of medicine today.

The purpose of the work: to determine the incidence and clinical significance of pancreatic injury in patients with closed brain injuries.

Results: As a result of the examinations conducted, patients with various degrees of severity of BMJ were included in the study, and clinical, biochemical, ultrasound examination, and, if necessary, CT data were analyzed in all patients. The results were evaluated using statistical methods. Functional disorders of the pancreas were detected in a certain proportion of patients with BPH. In most cases, hyperamylasemia, diffuse changes in the gland parenchyma, and signs of reactive pancreatitis were observed. It was noted that the rate of pancreatic injury in severe BMYoJs is significantly higher than in mild injuries.

Conclusions: In conclusion, it can be said that pancreatic damage is relatively common in closed head injuries and is closely related to the severity of the disease. Early diagnosis and dynamic monitoring of the pancreas in such patients is important in preventing complications.

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РАЗВИТИЕ ВЕРБАЛЬНО-ПРОФЕССИОНАЛЬНЫЕ КОМПЕТЕНЦИИ БУДУЩИХ ПРЕПОДАВАТЕЛЕЙ.

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Аннотация: В данной статье рассматривается проблема развития профессиональной компетенции будущих преподавателей посредством применения метода сторителлинга, который позволяет формировать навыки эффективной коммуникации и эмоциональной вовлеченности через создание и анализ образовательных историй.

Ключевые слова: Профессиональная коммуникация, педагогическая интеграция, речевые технологии, цифровая грамотность, коммуникативная адаптация, лексические стратегии, образовательный дискурс, диалогические навыки, межпрофессиональное общение, педагогическая экспрессия.

Annotatsiya: Ushbu maqola ta'lim hikoyalarini yaratish va tahlil qilish orqali samarali muloqot va hissiy jalb qilish ko'nikmalarini rivojlantirishga imkon beradigan hikoya usulidan foydalanish orqali bo'lajak o'qituvchilarning kasbiy malakasini rivojlantirish muammosini ko'rib chiqadi.

Kalit so'zlar: Kasbiy muloqot, pedagogik integratsiya, nutq texnologiyalari, raqamli savodxonlik, kommunikativ moslashuv, leksik strategiyalar, ta'lim nutqi, dialogik mahorat, kasblararo muloqot, pedagogik ifoda.

Annotation: This article examines the problem of developing the professional competence of future teachers through the use of the storytelling method, which allows one to develop the skills of effective communication and emotional involvement through the creation and analysis of educational stories.

Keywords: Professional communication, pedagogical integration, speech technologies, digital literacy, communicative adaptation, lexical strategies, educational discourse, dialogical skills, interprofessional communication, pedagogical expression.

В условиях современного образования важным аспектом подготовки будущих преподавателей является развитие вербально-профессиональных навыков. Эти

навыки включают в себя не только умение эффективно передавать знания, но и способность к конструктивной коммуникации, презентации материалов, а также управление учебным процессом и межличностными взаимодействиями в классе. Совершенствование этих навыков способствует формированию компетентных, уверенных в себе и готовых к профессиональной деятельности педагогов.

Важность этих навыков особенно велика для преподавателей высших учебных заведений, где роль коммуникации между преподавателем и студентами выходит на новый уровень. Совершенствование вербально-профессиональных навыков способствует формированию компетентных, уверенных в себе и готовых к профессиональной деятельности педагогов, способных создавать продуктивную и вдохновляющую образовательную среду. Особенно в контексте изменений в педагогической парадигме, перехода на цифровые технологии обучения и дистанционного образования, которые требуют от преподавателей не только высокого уровня знаний, но и способности донести информацию через различные цифровые каналы и интерактивные платформы.

Основные компоненты вербально-профессиональных навыков:

1. **Ораторское мастерство** Ораторское мастерство является одним из ключевых компонентов вербально-профессиональных навыков преподавателя. Оно включает умение ясно, логично и убедительно представлять информацию. Преподаватель должен уметь структурировать свои выступления, правильно использовать голосовые и речевые средства, а также вовлекать студентов в процесс обучения через активное слушание и вопросы.

2. **Коммуникативная компетентность** Коммуникативная компетентность включает способность эффективно взаимодействовать с аудиторией. Умение адаптировать свою речь в зависимости от аудитории, уровень подготовки студентов и контекста занятия помогает преподавателю более продуктивно взаимодействовать с различными группами и эффективно решать педагогические задачи.

3. **Аргументация и доказательная база** Навыки аргументации и построения логичных, убедительных высказываний важны для формирования критического мышления у студентов. Преподаватель должен уметь не только предоставлять информацию, но и обосновывать свою точку зрения, использовать научные данные, примеры и факты, которые поддерживают ключевые идеи. Это помогает студентам лучше понимать и воспринимать материал, развивает их способности к анализу и аргументированию.

Методы и технологии развития вербально-профессиональных навыков у будущих преподавателей

Методы и технологии, направленные на развитие вербально-профессиональных навыков у будущих преподавателей, являются ключевыми для их подготовки к успешной педагогической деятельности. Они способствуют развитию не только ораторского мастерства, но и умения вести диалог, слушать, аргументировать, а также управлять учебным процессом с учетом различных особенностей аудитории. Рассмотрим основные методы и технологии, которые помогают развить эти навыки.

1. **Тренинги** и **мастер-классы**

Курсы и практические занятия, направленные на развитие публичных выступлений и педагогической коммуникации, позволяют будущим преподавателям освоить основы риторики и эффективного взаимодействия с аудиторией.

2. **Ролевые игры** и **моделирование ситуаций**

Эти методы помогают развивать умение адаптироваться к различным аудиториям и решать конфликтные ситуации, что важно для успешной работы в классе.

3. **Использование** **ИКТ**

Онлайн-платформы и мультимедийные технологии помогают тренировать вербальные навыки в виртуальной среде, что актуально для дистанционного и смешанного обучения.

4. **Оценка** и **самооценка**

Анализ своих уроков и получение обратной связи от студентов помогают преподавателям совершенствовать свои коммуникативные навыки и повышать эффективность преподавания

Важной основой для развития вербально-профессиональных навыков преподавателей в Узбекистане является законодательная база. "В соответствии с **Законом Республики Узбекистан "Об образовании" (редакция 2023 года)**, подготовка преподавателей в высших учебных заведениях включает не только академические знания, но и развитие ключевых вербально-профессиональных навыков. Это отражает потребность в высококвалифицированных педагогах, обладающих способностью эффективно коммуницировать, а также решать педагогические задачи через использование современной риторики и методов преподавания."

Развитие вербальных навыков способствует:

1. **Эффективной передаче знаний.** Умение точно, доступно и интересно формулировать информацию способствует лучшему усвоению материала студентами. Преподаватели с развитыми вербальными навыками могут

адаптировать свой стиль общения в зависимости от уровня аудитории, что повышает результативность учебного процесса.

2. Выстраиванию продуктивных отношений с аудиторией.

Коммуникация между преподавателем и студентами — это двусторонний процесс, включающий не только речь преподавателя, но и активное слушание и вовлеченность. Развитие этих навыков позволяет создавать открытое, уважительное и конструктивное взаимодействие, что способствует установлению положительной атмосферы в классе.

3. Решению профессиональных задач в различных учебных ситуациях.

Разнообразные образовательные ситуации требуют от преподавателя умения находить подход к каждому студенту, управлять дисциплиной, давать конструктивную обратную связь и эффективно решать возникающие проблемы. Умение справляться с этими задачами напрямую связано с качеством педагогического общения.

Развитие вербально-профессиональных навыков у будущих преподавателей играет ключевую роль в их подготовке к успешной педагогической деятельности. Эти навыки помогают эффективно передавать знания, выстраивать продуктивные отношения с аудиторией и решать профессиональные задачи в различных учебных ситуациях. Современные методы и технологии, такие как тренинги, ролевые игры, использование ИКТ и самооценка, способствуют совершенствованию вербальных навыков и адаптации преподавателей к изменяющимся условиям образовательного процесса. В конечном итоге, развитие этих навыков способствует повышению качества образования и профессиональной компетентности будущих педагогов.

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**FLYING TOWARD THE FUTURE: MODERNIZATION AND
COMPARISON BETWEEN UZBEKISTAN AIRLINES AND POPULAR
AIRLINE INDUSTRIES, STUDYING THE IMPACT OF THE AIRLINE
INDUSTRY ON TOURISM DEVELOPMENT IN UZBEKISTAN**

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Abstract

This article examines the effects of the airline industry in sustainable tourism in Uzbekistan by focusing on some methods that need to be applied in Uzbekistan Airways. This research highlights the impacts of modernization and digital improvements in optimizing operational efficiency, passenger experience and its global market strength, by studying comparisons with Qatar Airways and Turkish Airlines identifying key areas for improvements such as in network connectivity, service quality staff professionalism, partnerships with tourism stakeholders. Overall, the article below gives some strategic development recommendations that plays crucial role in sustainable tourism growth of Uzbekistan and increase country’s position as a key travel destination around the world.

Keywords: Uzbekistan Airways, Turkish Airlines, Qatar Airways, comparative studies, modernization, passenger experience, service quality

INTRODUCTION

In recent years the airline industry can be considered as one of the most important players of tourism, since it plays crucial role as a big bridge between many countries that helps to connect destinations and make travellers’ journeys shorter and enjoyable. In today’s digital era, using advanced and computerized technologies in airline industry is a key factor in this field and Uzbekistan’s Air industry has a notable progress in implying these methods on its services. But, when it comes to compare with famous international airlines, there are still many deficiencies in Uzbekistan Airways airline industry such as not enough digitizing in airports and limited international influence. This article will analyse modernizing methods of Uzbekistan Airlines, and comparisons between popular international airlines, such as

Turkish Airlines, Qatar Airways and Lufthansa Airlines, as well as investigate the influence of this industry in tourism field.

Modernization in Uzbekistan Airlines

In modern aviation industry, modernization, using advanced and updated technologies plays very significant role to develop airline system. Even if there are continuous upgrades in global airlines, in case of Uzbekistan airline system there are some weaknesses and challenges that need to be solved to apply new modernization methods and meet the international aviation standards. “Uzbekistan Airways is National Air Carrier and Flag Carrier of Republic of Uzbekistan that is founded in 28 January 1992, and inherited its’ starting infrastructure from USSR main carrier Aeroflot (now the largest carrier in Russian Federation)” (Pulatov, 2024). As one of the Uzbek researchers mentioned in his research, for many years Uzbekistan airways has been using almost same and similar operational methods to manage their airline’s business operations. For example, Uzbekistan Airways uses Boeing 787-8 for international flights and Airbus A320/A321 models usually for regional routes and just because models are not modern enough and less fuel-efficient it costs a lot and they can cause emissions and noise pollutions and as a result its not environmentally friendly and need to be replaced with updated aircrafts such as Boeing 787-9 Dreamliner instead of Boeing 787-8, and Airbus A320neo as a replacement for Airbus A320/A321. The reasons to use these aircraft models instead of old ones are:

- expanding capacity: new models provide increased cargo and passenger capacity;
- saving time: no need to stop for refueling during flights to international destinations;
- reducing operating costs: flexible and modern engines reduces extra costs;
- benefits for environment: since new models more fuel-efficient, it leads reduction of CO₂.

Applying these new changes in national airline industry helps to build new modern era in this field. Additionally, except fleet modernization Uzbekistan Airways should also focus on digitization, especially upgraded booking systems, AI-powered scheduling and safety control checking’s in order to enhance passenger experience who use that airline services. As Khalikov and other researchers mentioned in their article named “Uzbekistan’s Development under the Leadership of Various Political Reforms: “The Case of Air Transport Industry””: Uza [Uzbekistan Airways] implements excessive safety control checks at the Uzbek airports reducing the free time of passengers, which they could spend at duty-free shops or eateries”(2021). As previously noted, extended security checks limit passengers’ free time and reduces their opportunities to visit duty-free shops or cafeterias inside the airport. But implementing AI-powered equipment’s like automated check-in kiosks, security screening tools with AI and smart

boarding systems can reduce long waiting times, improve passenger satisfaction. In general, the usage of digital and modern technologies, aircrafts allows Uzbekistan Airways to overcome some challenges, and optimizes passenger services, so it helps to maintain a competitive role in the developing aviation industry.

Comparison between Uzbekistan Airways and Popular International Airlines such as Qatar Airways and Turkish Airlines

Apart from technological advancements, there can be an improvement in Uzbekistan Airways by comparing it with other leading global carriers. Through these comparisons there is a chance to study the differences and similarities in passenger experience, quality of the service, network reach and connectivity and enhance its competitiveness. In terms of network connectivity and network reach there are facts that shows Qatar Airways serves more than 180 international destinations across 80+ countries and the all continents, while Turkish Airlines shows huge network connectivity with approximately 340 locations and 129+ countries which was awarded with a Guinness World Record award, when comparing to Uzbekistan Airways there are about 70+ worldwide destinations and flights are to 29+ countries in Europe, Asia and the Middle East only. With this comparative analysis it's obvious that Uzbekistan Airways has a lot to implement from leading Airline industries. Another comparison can be about passenger satisfaction, since Uzbekistan Airways is not big industry it does not have strong brand reputation and it's not featured in major global passenger satisfaction rankings and its recognition is lower than Qatar and Turkish Airlines. When it comes to passenger satisfaction Qatar Airways was named World's Best Airline by Sytrax in 2025 and its rating score is 9.4 out of 10 for passenger experience, reliability and services, when Turkish Airlines got 8/10 score in this rating (Sytrax, 2025). Turkish Airlines' goal is "offering quality, entertainment systems within the aircrafts, comfortable seats, aesthetics, and quality of presentations and investing in highly qualified personnel" (Sezgin & Kozak, 2012). However, there were some complains about Uzbekistan Airways' poor service quality and not qualified or uninterested cabin crew among passengers. Not only service quality, but employees' qualification is also crucial in this industry. For example in case study of Qatar Airways its mentioned that: "professionalism and responsibility have become a core principle in the firm. The values that are highly esteemed in the firm include loyalty, social responsiveness, cooperation with all stakeholders, and environmental awareness"(Qatar Airways 2021). Overall, while Uzbekistan Airways is in progress of expanding its network and improving their services there are so many deficiencies and national airline company needs to adopt those upgraded services and innovations to meet up with the

trends and global standards and strengthen its brand reputation and keep its competitiveness.

Connectivity between Airline Industry and Tourism Development

Development in the airline industry plays crucial role to improve the tourism sector as well. Since for the past decades tourism has increased significantly, it requires efficient air connectivity, advanced airport infrastructure and improving number of local and international flights. As one of the experts in tourism sector mentioned in his research: “The quality and ideas towards airport services impact the development of the business and tourism industry” (Shahparan, 2024). This demonstrates there are strong connection between airline and tourism industry in every country. Especially, in Uzbekistan tourism is one of the main income source and building tight relationship between these two huge industries can lead to significant tourism growth. In order to do so, firstly improvements and adjustments in airline services are required, specifically in, service quality, passenger experience and route expansion. Because “The quality of innovative services helps passengers to grow their satisfaction which is a positive point for growing the tourism industry” (Pantouvakis, 2016), similarly one of the experts in tourism industry Mohammad Shahparan had also similar argument about it, he said in his research: “The quality of airport services influences the tourists to visit again ... In the airport, it is important to ensure the tourist's satisfaction to provide quality services. If it ensures that tourists are much more satisfied with airport services it will be a positive for tourism sector development” (2024). Because of this Uzbekistan Airways should improve their service quality to satisfy the passengers: As a main element of tourism, tourists’ satisfaction has to be main focus area whenever we try to build sustainable tourism industry. Not only service quality and tourism satisfaction, but route expansion is also important for the tourism development, The reason is that if there are many direct flights from international destinations it allows tourists to use more Airline services and encourage them to choose Uzbekistan as a travel destination. In general, strengthening airline and tourism industries connection helps to set up sustainable tourism growth.

Conclusion

In summary, main essential factors such as modernization and usage of advanced digital technologies provide efficiency in operational systems and adjustments in service quality is the way to increase passenger satisfaction. Studying leading airline industries and implementing their strategies in Uzbekistan Airways by comparisons will elevate its international standing and competitiveness. Adopting new trends and applying them in real life is the best way to boost economic and touristic development in Uzbekistan.

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ГИСТОЛОГИЯ СЕРДЕЧНОЙ И СКЕЛЕТНОЙ МЫШЕЧНОЙ ТКАНИ
HISTOLOGY OF CARDIAC AND SKELETAL MUSCLE TISSUE
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Аннотация: В работе рассматриваются гистологические особенности сердечной и скелетной мышечной ткани. Описаны их происхождение, клеточный состав и особенности микроскопического строения. Особое внимание уделено организации сократительного аппарата, расположению ядер, характеру межклеточных контактов и обеспечению функциональной активности мышечных тканей. Проведено сопоставление скелетной и сердечной мышечной ткани с точки зрения морфологии, регуляции сокращений и регенераторных возможностей. Показано, что, несмотря на общую поперечнополосатую организацию, данные ткани обладают выраженными структурными и функциональными различиями, обусловленными их физиологической ролью в организме.

Abstract: The study examines the histological features of cardiac and skeletal muscle tissue. Their origin, cellular composition, and microscopic structure are described. Special attention is given to the organization of the contractile apparatus, the arrangement of nuclei, the nature of intercellular contacts, and the provision of

functional activity of muscle tissues. A comparison of skeletal and cardiac muscle tissue is carried out in terms of morphology, contraction regulation, and regenerative capabilities. It is shown that, despite their common striated organization, these tissues have pronounced structural and functional differences determined by their physiological role in the body.

Annotatsiya: Ishda yurak va skelet mushagi to'qimasining gistologik xususiyatlari ko'rib chiqilgan. Ularning kelib chiqishi, hujayra tarkibi va mikroskopik tuzilishi tavsiflangan. Maxsus e'tibor qisqaruvchi apparatning tashkil etilishiga, yadrolarning joylashuviga, hujayralararo kontaktlarning xususiyatiga va mushak to'qimalarining funksional faoliyatini ta'minlashga qaratilgan. Skelet va yurak mushagi to'qimalari morfologiya, qisqarishlarni tartibga solish va regeneratsiya imkoniyatlari nuqtai nazaridan solishtirilgan. Ko'rsatildiki, umumiy gorizontall chiziqli tashkilotiga qaramay, ushbu to'qimalar ularning fiziologik roli bilan belgilanadigan sezilarli tuzilmaviy va funksional farqlarga ega.

Ключевые слова: гистология, мышечная ткань, скелетная мышечная ткань, сердечная мышечная ткань, кардиомиоциты, мышечные волокна, поперечнополосатая мышца, миокард.

Keywords: histology, muscle tissue, skeletal muscle tissue, cardiac muscle tissue, cardiomyocytes, muscle fibers, striated muscle, myocardium.

Kalit so'zlar: gistologiya, mushak to'qimasi, skelet mushagi to'qimasi, yurak mushagi to'qimasi, kardiomiotsitlar, mushak tolalari, chiziqli mushak, miokard.

Введение: Мышечная ткань представляет собой специализированную ткань организма, основным свойством которой является способность к сокращению в ответ на раздражение. Эта способность лежит в основе движения, поддержания позы, работы внутренних органов и кровообращения. Среди разновидностей мышечной ткани особое значение имеют скелетная и сердечная поперечнополосатые мышечные ткани, которые, несмотря на сходство в микроскопическом строении, существенно различаются по функциям, регуляции и регенераторным возможностям.

Скелетная мышечная ткань формируется из мезодермального зачатка и составляет основную массу произвольной мускулатуры тела. Она участвует в выполнении осознанных движений, поддержании положения тела в пространстве и теплообразовании. Основным структурным элементом скелетной мышечной ткани является мышечное волокно, представляющее собой длинную цилиндрическую многоядерную структуру. Мышечное волокно образуется в результате слияния миобластов, вследствие чего формируется симпласт с

большим количеством ядер. Ядра располагаются по периферии клетки непосредственно под сарколеммой, что является характерным диагностическим признаком скелетной мышцы.[1]

Цитоплазма мышечного волокна, называемая саркоплазмой, содержит многочисленные миофибриллы, митохондрии, включения гликогена и белок миоглобин. Миофибриллы имеют чёткую упорядоченную структуру и состоят из повторяющихся сократительных единиц, называемых саркомерами. Именно регулярное чередование светлых и тёмных участков миофибрилл обуславливает выраженную поперечную исчерченность скелетной мышечной ткани, хорошо различимую при световой микроскопии. Сокращение мышечного волокна осуществляется за счёт взаимодействия тонких актиновых и толстых миозиновых филаментов, что приводит к укорочению саркомеров.[2]

Скелетная мышца как орган имеет сложную соединительнотканную организацию. Каждое мышечное волокно окружено тонкой оболочкой из рыхлой соединительной ткани, группы волокон объединяются в пучки, а вся мышца покрыта плотной соединительнотканной оболочкой. Эти структуры обеспечивают механическую прочность мышцы, передачу силы сокращения и проведение сосудов и нервов. Иннервация скелетной мышечной ткани осуществляется соматической нервной системой, что обеспечивает произвольный характер сокращений.[3]

Регенерация скелетной мышечной ткани ограничена. Восстановление повреждённых волокон возможно благодаря наличию сателлитных клеток, которые сохраняют способность к делению и дифференцировке. Однако при значительных повреждениях мышечная ткань часто замещается соединительной тканью, что приводит к снижению функциональной активности мышцы.

Сердечная мышечная ткань образует миокард сердца и развивается из висцеральной мезодермы. Она обеспечивает непрерывную и ритмичную работу сердца, необходимую для поддержания кровообращения. В отличие от скелетной мышцы, сердечная мышечная ткань функционирует непроизвольно и регулируется автономной нервной системой и гуморальными факторами.[4]

Основным клеточным элементом сердечной мышечной ткани является кардиомиоцит. Эти клетки имеют цилиндрическую форму, относительно небольшую длину и склонность к ветвлению. Кардиомиоциты соединяются между собой, образуя функциональный синцитий. Ядра в кардиомиоцитах располагаются в центральной части клетки, чаще всего в единственном экземпляре, что является важным отличительным признаком по сравнению со скелетной мышечной тканью.

Кардиомиоциты также обладают поперечной исчерченностью, поскольку их миофибриллы организованы в саркомеры. Однако расположение миофибрилл менее строгое, чем в скелетных мышечных волокнах. В саркоплазме кардиомиоцитов содержится большое количество митохондрий, что отражает высокую потребность сердечной мышцы в энергии и её зависимость от аэробного метаболизма.

Особенностью сердечной мышечной ткани являются вставочные диски, представляющие собой специализированные межклеточные контакты. Они обеспечивают прочную механическую связь между клетками и способствуют быстрому распространению электрического импульса по миокарду. Благодаря этим структурам сердечная мышца сокращается как единое целое, что имеет решающее значение для её насосной функции.[5]

В сердечной мышечной ткани различают несколько функциональных разновидностей кардиомиоцитов. Основную массу составляют рабочие кардиомиоциты, обеспечивающие сокращение миокарда. Проводящая система сердца образована специализированными клетками, которые генерируют и проводят электрические импульсы. В предсердиях также присутствуют кардиомиоциты, обладающие секреторной активностью и участвующие в регуляции водно-солевого баланса организма.

Регенераторные возможности сердечной мышечной ткани крайне ограничены. Кардиомиоциты практически не способны к делению, поэтому при повреждении миокарда, например при ишемии, погибшие клетки замещаются соединительной тканью. Это приводит к образованию рубца и снижению сократительной способности сердца.

Таким образом, скелетная и сердечная мышечные ткани имеют общую поперечнополосатую организацию и сходный механизм сокращения, однако значительно различаются по морфологии клеток, характеру регуляции, функциональной нагрузке и способности к регенерации. Эти различия отражают высокую степень специализации каждой из тканей и их адаптацию к выполняемым физиологическим задачам.[6]

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**ЛЕЧЕБНАЯ СВОЙСТВА КУРКУМЫ ПРИ ЛЕЧЕНИЕ
ГИНЕКОЛОГИЧЕСКИХ ЗАБОЛЕВАНИЙ КАК МИОМА МАТКИ И
ЭНДОМЕТРИОЗ.
THERAPEUTIC PROPERTIES OF TURMERIC IN THE TREATMENT OF
GYNECOLOGICAL DISEASES SUCH AS UTERINE MYOMA AND
ENDOMETRIOSIS.
KURKUMANING BACHADON MIOMASI VA ENDOMETRIOZ KABI
GINEKOLOGIK KASALLIKLARNI DAVOLASHDAGI SHIFOBAHSH
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Аннотация: Куркума от лат.(curcuma) В народном целительстве куркума используется с незапамятных времен. Ряд проведенных исследований подтвердил эффективность применения пряности в лечении женских заболеваний. В результате ее применения нормализуется липидный обмен, улучшается пищеварение, устраняются симптомы простудных заболеваний, нормализуется гормональный фон. Куркума способствует очищению крови,

снижает уровень сахара и холиестерина, является отличным средством профилактики атеросклероза. При регулярном приеме средств на основе пряности отмечается улучшение работы системы пищеварения, снижается кислотность желудочного сока и активизируется обмен веществ.

Ключевые слова: Воспалительные заболевания, воспалениях матки, воспаление яичников и фаллопиевых труб, (эндометрит, аднексит, сальпингит), уменьшает спазмы и снимает воспаления, регулирует уровень гормона, эндометриоз, миома матки.

Annotation. Turmeric from Latin (curcuma) Turmeric has been used in folk medicine since time immemorial. A number of studies have confirmed the effectiveness of the spice in the treatment of women's diseases. As a result of its use, lipid metabolism is normalized, digestion is improved, symptoms of colds are eliminated, and hormonal levels are normalized. Turmeric helps purify the blood, lowers sugar and cholesterol levels, and is an excellent means of preventing atherosclerosis. With regular use of spice-based products, the digestive system improves, gastric acidity decreases, and metabolism is activated.

Keywords. Inflammatory diseases, inflammation of the uterus, inflammation of the ovaries and fallopian tubes (endometritis, adnexitis, salpingitis), reduces spasms and relieves inflammation, regulates hormone levels, endometriosis, uterine fibroids.

Annotatsiya. Lotin tilidan zerdeçal (curcuma) Zerdeçal xalq tabobatida qadim zamonlardan beri ishlatilgan. Bir qator tadqiqotlar ayollar kasalliklarini davolashda ziravorning samaradorligini tasdiqladi. Uni qo'llash natijasida lipidlar almashinuvi normallasadi, ovqat hazm qilish yaxshilanadi, shamollash belgilari yo'q qilinadi va gormonal darajalar normallasadi. Zerdeçal qonni tozalashga yordam beradi, shakar va xolesterin darajasini pasaytiradi va aterosklerozning oldini olish uchun ajoyib vositadir. Ziravorlarga asoslangan mahsulotlarni muntazam ravishda ishlatish bilan ovqat hazm qilish tizimi yaxshilanadi, oshqozon kislotasi kamayadi va metabolizm faollashadi.

Kalit so'z. Yallig'lanish kasalliklari, bachadonning yallig'lanishi, tuxumdonlar va bachadon naychalarining yallig'lanishi (endometrit, adneksit, salpingit), spazmlarni kamaytiradi va yallig'lanishni engillashtiradi, gormonlar darajasini, endometriozni, bachadon miomasini tartibga soladi.

Введение: Добавка куркумы к пище способствует выработке желчи и желудочного сока, является средством, повышающим аппетит. В народной медицине куркуму применяли при заболеваниях печени и желчного пузыря, почек, а также как желудочное средство, улучшающее пищеварение и

повышающее аппетит. Она регулирует уровень холестерина в крови. Ее пьют на ночь с горячим молоком, маслом, какао и медом. Для укрепления волос ее втирают в голову вместе с сандаловым маслом, при кожных заболеваниях, порезах и ссадинах используют в качестве присыпки.

Лечение миомы матки народными средствами в последнее время приобрело популярность. Это допустимо при нетяжелых состояниях. Однако следует помнить, что новообразование – серьезная проблема, потому часто требует грамотного квалифицированного лечения. В комплексе с такой терапией, некоторыми пациентками принимается куркума при миоме матки.



Стоит помнить, что любые народные рецепты при данном заболевании действенны только в качестве дополнительных. Самостоятельно они не справятся с проблемой и не вызовут деградации узла. Потому применять их нужно только в качестве дополнительной терапии. Или при состояниях, не вызывающих опасности для здоровья, при отсутствии тяжелой симптоматики. Самый простой способ – употребление порошка куркумы в чистом виде. Рекомендуется съесть 400-600 мг три раза в сутки. Лучше делать это за 20-30 минут до еды. Также параллельно с этим стоит добавлять куркуму в блюда. Такое применение имеет значительный эффект. При регулярном употреблении особенно хорошо снимает боль (причем не только при миоме, но и любые другие спазмы).

Иногда в аптеках можно встретить жидкий экстракт куркумы. Его проще пить, так как он обладает не таким выраженным запахом и более приятной консистенцией, чем порошок. Подойдет средство с концентрацией 1 к 1.

Принимают его ежедневно, один раз, перед завтраком. Начальная дозировка составляет 30 капель в день. Постепенно она доводится до 90 капель.



Также можно принимать спиртовую настойку. Она продается в аптеках и противопоказана женщинам, страдающим алкогольной зависимостью, или лечащимся от нее. Принимать нужно 4 раза в сутки, перед едой, по 15 капель за один прием.

Хорошим способом является добавление пряности в те или иные блюда. Важно помнить, что ее лучше не обрабатывать термически. Потому добавлять в горячие блюда или при готовке нельзя. Лучше обойтись салатами, выпечкой, соусами и т. д.

Патологии печени и желчного пузыря:

Средство уменьшает содержание вредного холестерина, избавляя печень от ожирения. Стимулирует выработку желчи, выводит токсины, препятствует образованию раковых клеток и развитию фиброза. В отношении профилактики заболеваний печени возникает вопрос, как правильно пить куркумин – до еды или после? Специалисты рекомендуют делать это во время принятия пищи, поскольку под воздействием жира средство лучше усваивается. Особенно показан прием куркумина тем, кто злоупотребляет алкоголем.

Патологии нервной системы:

Куркумин – отличный нейропротектор. Вещество активно противостоит нервным расстройствам и стимулирует деятельность мозга:

- снижение симптоматики депрессивных состояний и биполярного расстройства;
- посттравматические и стрессовые расстройства;
- улучшение памяти;
- профилактика болезни Альцгеймера;

предотвращение возникновения болезни Паркинсона;
 помощь в реабилитации после инсульта;
 облегчение страданий при эпилептических припадках.

Исторические факты: Как пряность куркума известна более 2,5 тысяч лет. В конце I века ее впервые ввезли в Древнюю Грецию. Греки называли ее желтым имбирем. 400 лет после того, как она появилась в Европе, ее узнал Китай и именно здесь вырастили лучшие торговые сорта куркумы., чревы редкие на мировом рынке и оттого имеющие высокую стоимость.

В данной анотации рассматриваются основные компоненты куркумы, механизмы их действия, а также результаты клинических исследований, подтверждающих эффективность применения куркумы в лечения гинекологических заболеваний.

Куркума: многолетние травы с толстыми, разветвлёнными, мясистыми и ароматными корневищами, придаточные корни зачастую имеют клубневидные утолщения. Из множества видов куркумы только три находят применение в кулинарии. В первую очередь для приготовления специй и приправ идёт:

Куркума длинная (*curcuma longa*)

Куркума ароматная (*curcuma aromatic*)

Куркума цедоария (*curcuma zedoaria*)

Куркума содержит 67,1 г углеводов в 100 г продукта, это примерно 79% всей энергии из порции или 269 кКал.

-Состав куркумы:

*жиры — 3,25 г

*белки — 9,68 г

*вода — 12,85 г

*зола — 7,08 г

Химический состав куркумы

Основные вещества (г/100 г)	Молотая куркума содержит
Вода	12,85 г
Углеводы	67,14 г
Белки	9,68 г
Жиры	3,25 г
Калории	312 Ккал
Минералы	Мг/100г
Калий	2080
Фосфор	299

Магний	208
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Полезные свойства куркумы:

Как свидетельствует мудрая наука о жизни и долголетию Аюрведа, куркума и ее польза для здоровья были известны древним врачевателям еще несколько тысячелетий назад. Пряность, пришедшую к нам из Индии, не случайно называют любимицей природы. Она единственная из всего семейства имбирных обладает большой целительной силой и редкой способностью очищать и обновлять кровь. Благодаря уникальному набору микроэлементов и витаминов, приправа широко применяется в кулинарии, косметологии, используется в народной и традиционной медицине.

10 полезных свойств: Попадая в организм человека с едой и напитками, приправа не просто улучшает вкус и аромат блюд, полезные свойства куркумы проявляются в активном воздействии на внутренние органы и системы:

1. Являясь сильным антиоксидантом, порошок желтого корня замедляет процессы старения, способствует восстановлению клеток печени.
2. Нормализует работу ЖКТ, устраняет кишечные воспаления, отлично справляется с главным виновником развития язвы желудка и 12-перстной кишки бактерией Хеликобактер.
3. Избавляет от метеоризма и хронической диареи.
4. Снижает риск возникновения раковых заболеваний толстой кишки и кожного покрова.
5. Куркумин препятствует отложению холестериновых бляшек, развитию атеросклероза, инфаркта и инсульта, приводит в норму давление.
6. Ускоряет метаболизм, позволяет избавиться от лишних сантиметров на талии
7. Положительно сказывается на работе желчного пузыря, стимулирует производство желчи.
8. Убивает патогенную микрофлору и вирусы.
9. Способствует росту красных кровяных телец, очищает сосуды от «плохого» холестерина, разжижает кровь.
10. Понижает уровень сахара в крови, помогает бороться с ожирением.

Рассматривая вопрос пользы и вреда куркумы для здоровья, нельзя не упомянуть, что одной щепотки порошка, ежедневно добавляемой в пищу, достаточно, чтобы защитить себя от развития болезни Альцгеймера. Если Вы не знаете, что можно приготовить с куркумой, просто закажите продукты и рецепты от шеф-повара Elementaree. Потрясающе вкусныеи

полезные блюда здорового питания всегда будут на Вашем столе. С готовкой справится даже начинающий неопытный кулинар.

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“HOMILADORLIK DAVRIDA FIZIOTERAPIYA VA REABILITATSIYA XUSUSIYATLARI”

**Sariosiyo tumani Abu Ali ibn Sino nomidagi Jamoat salomatligi texnikumi
Maxsus fan kafedrasi Reabilitatsiya asoslari hamda fizioterapiya fan
o'qituvchisi**

Xoliqova Mahliyo Abduhalimovna

Annotatsiya

Ushbu maqolada homiladorlik davrida fizioterapiya va reabilitatsiyaning nazariy va amaliy jihatlarini tahlil qilinadi. Homilador ayollarda mushak-skelet tizimini qo'llab-quvvatlash, mushak tonusini saqlash, ortiqcha vazn va shishlarni kamaytirish hamda tug'ruq jarayoniga tayyorgarlik ko'rishda fizioterapiya muhimligi yoritiladi. Maqolada turli fizioterapevtik usullar, mashqlar, massaj va suv terapiyasining samaradorligi ko'rib chiqiladi.

Kalit so'zlar: homiladorlik, fizioterapiya, reabilitatsiya, mushak-skelet tizimi, jismoniy mashqlar, massaj

Абстрактный

В данной статье анализируются теоретические и практические аспекты физиотерапии и реабилитации в период беременности. Особое внимание уделяется поддержанию мышечно-скелетной системы, сохранению тонуса мышц, уменьшению избыточного веса и отёков, а также подготовке к родам. Рассматриваются различные методы физиотерапии, упражнения, массаж и водная терапия.

Ключевые слова: беременность, физиотерапия, реабилитация, опорно-двигательная система, физические упражнения, массаж

Abstract

This article analyzes the theoretical and practical aspects of physiotherapy and rehabilitation during pregnancy. It emphasizes the importance of supporting the musculoskeletal system, maintaining muscle tone, reducing excessive weight and edema, and preparing for childbirth. Various physiotherapeutic methods, exercises, massage, and hydrotherapy are examined.

Keywords: pregnancy, physiotherapy, rehabilitation, musculoskeletal system, physical exercises, massage

KIRISH

Homiladorlik davri ayol organizmida katta o'zgarishlar bilan kechadi. Bu davrda mushak-skelet tizimi, yurak-qon tomir, endokrin va boshqa tizimlar faoliyati o'zgaradi. Shuningdek, ayolning psixologik holati, jismoniy yuklama va metabolizm darajasi ham o'zgaradi. Shu sababli homiladorlik davrida sog'lom turmush tarzini saqlash, mushak va bo'g'imlarni mustahkamlash, jismoniy faoliyatni to'g'ri tashkil etish muhim hisoblanadi.

Fizioterapiya va rehabilitatsiya bu davrda organizmning normal ishlashini saqlash, ortiqcha vazn, mushak tarangligi va shishlarni kamaytirish, shuningdek, tug'ruq jarayonini yengillashtirishga yordam beradi. Tadqiqotlar shuni ko'rsatadiki, homiladorlik davrida moslashtirilgan mashqlar va fizioterapevtik muolajalar ayolning sog'lig'ini mustahkamlash va kelajakdagi tug'ruqni yengillashtirishda samarali bo'ladi.

Kirish qismida maqola maqsadi aniqlanadi: homiladorlik davrida fizioterapiya va rehabilitatsiya usullarini tahlil qilish, ularning samaradorligini aniqlash, shuningdek, homilador ayollar uchun xavfsiz va individual yondashuvni ishlab chiqish.

Asosiy qism

Homiladorlik davrida organizm xususiyatlari. Homiladorlikda ayol organizmida fiziologik va anatomik o'zgarishlar yuz beradi. Mushak-skelet tizimida yuk oshadi, bel va tos sohasida og'riq kuzatiladi. Yurak-qon tomir tizimi faollashadi, qon aylanishi kuchayadi, shishlar va ortiqcha vazn paydo bo'lishi mumkin. Shu sababli mushak va bo'g'imlarni qo'llab-quvvatlash, mushak tonusini saqlash, stress va og'riqni kamaytirish uchun fizioterapevtik yondashuv zarur.

Fizioterapiya usullari-Fizioterapiya homiladorlik davrida quyidagi usullarni o'z ichiga oladi:

Jismoniy mashqlar: maxsus yengil mashqlar mushaklarni mustahkamlash, bel va tos sohasidagi og'riqni kamaytirish, qon aylanishini yaxshilashga xizmat qiladi.

Massaj: bel, bo'yin, oyoq va qo'l mushaklarini yumshatish, shishlarni kamaytirish va relaxatsiya ta'minlaydi.

Suv terapiyasi: suvda mashq qilish mushaklarga yukni teng taqsimlaydi, bo'g'imlarga stressni kamaytiradi va yurak-qon tomir tizimi faoliyatini normallashtiradi.

Nafas olish mashqlari: nafas va diafragma mashqlari tug'ruq jarayonini yengillashtirish va stressni kamaytirish imkonini beradi.

Rehabilitatsiya xususiyatlari. Homiladorlikdan keyingi rehabilitatsiya organizmni tiklash, mushak tonusini saqlash, bel va tos sohasidagi og'riqlarni kamaytirish, shuningdek, psixologik holatni barqarorlashtirishga qaratilgan. Rehabilitatsiya shuningdek, tug'ruqdan keyingi mushak-skelet tizimi tiklanishi, ortiqcha vazn kamayishi va jismoniy faollikni tiklashni ta'minlaydi.

Individual yondashuv va xavfsizlik. Fizioterapiya va reabilitatsiya dasturi har bir homilador ayolning individual xususiyatlariga mos kelishi zarur. Bu yondashuv mushak-skelet tizimi holati, sogʻliq koʻrsatkichlari va homiladorlik bosqichini hisobga oladi. Xavfsizlikni taʼminlash uchun mashqlar intensivligi va turini shifokor nazorati ostida belgilash muhim.

Tadqiqot va amaliy tajribalar. Tadqiqotlar shuni koʻrsatadiki, homiladorlik davrida moʻljallangan mashqlar va fizioterapevtik muolajalar mushak tonusini saqlash, ortiqcha vaznni nazorat qilish va tugʻruq jarayonini yengillashtirishda samarali boʻladi. Shuningdek, muntazam fizioterapiya homilador ayolning ruhiy holatini yaxshilaydi, stress va asabiy taranglikni kamaytiradi.

Xulosa

Homiladorlik davrida fizioterapiya va reabilitatsiya ayol sogʻligʻini qoʻllab-quvvatlash va tugʻruq jarayonini yengillashtirishda muhim vositadir. Maxsus mashqlar, massaj, suv terapiyasi va nafas olish mashqlari mushak-skelet tizimi holatini yaxshilaydi, ortiqcha vazn va shishlarni kamaytiradi, psixologik holatni barqarorlashtiradi. Fizioterapiya va reabilitatsiya dasturi individual xususiyatlarga moslashtirilishi va shifokor nazorati ostida amalga oshirilishi kerak. Shu tarzda homiladorlik davrida ayolning sogʻligi mustahkamlanadi, tugʻruq jarayoni yengillashtiradi va postnatal davr uchun tayyorgarlik samarali boʻladi.

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ЗАБОЛЕВАНИЯ СЕРДЕЧНО-СОСУДИСТОЙ СИСТЕМЫ. ВРОЖДЕННЫЕ ПОРОКИ СЕРДЦА

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АННОТАЦИЯ

В статье рассматриваются основные заболевания сердечно-сосудистой системы и врождённые пороки сердца как одна из наиболее актуальных проблем современной медицины. Сердечно-сосудистые заболевания на протяжении последних десятилетий остаются ведущей причиной смертности и инвалидизации населения во всём мире. Особое внимание уделяется врождённым порокам сердца, которые формируются в эмбриональном периоде и оказывают существенное влияние на физическое развитие, качество и продолжительность жизни пациентов. В работе освещены анатомо-физиологические особенности сердечно-сосудистой системы, классификация и этиология заболеваний, патогенетические механизмы, клинические проявления, современные методы диагностики, лечения и профилактики. Подчёркивается значимость раннего выявления и комплексного междисциплинарного подхода в ведении больных с врождёнными пороками сердца.

Ключевые слова: сердечно-сосудистая система, заболевания сердца, врождённые пороки сердца, патогенез, диагностика, лечение, профилактика, кардиология.

ВВЕДЕНИЕ

Сердечно-сосудистая система играет ключевую роль в обеспечении жизнедеятельности организма человека. Основной функцией данной системы является транспорт кислорода, питательных веществ, гормонов и продуктов обмена веществ ко всем органам и тканям. Нарушение работы сердца или сосудов неизбежно приводит к развитию патологических состояний, способных значительно ухудшить качество жизни и привести к летальному исходу.

На современном этапе развития медицины заболевания сердечно-сосудистой системы признаны одной из главных медико-социальных проблем. По данным

Всемирной организации здравоохранения, сердечно-сосудистые заболевания ежегодно становятся причиной смерти миллионов людей. Несмотря на значительный прогресс в диагностике и лечении, распространённость данной группы заболеваний продолжает расти, что обусловлено изменением образа жизни, старением населения, воздействием стрессовых факторов и неблагоприятной экологической обстановкой.

Особое место среди сердечно-сосудистых заболеваний занимают врождённые пороки сердца. Эти патологии формируются ещё на стадии внутриутробного развития и нередко выявляются в раннем детском возрасте. Врожденные пороки сердца могут протекать как в относительно лёгкой форме, так и сопровождаться тяжёлыми гемодинамическими нарушениями, требующими сложного хирургического вмешательства. Актуальность изучения данной проблемы обусловлена высокой распространённостью, сложностью лечения и необходимостью длительного медицинского наблюдения за пациентами.

Основная часть

Анатомо-физиологические особенности сердечно-сосудистой системы

Сердце представляет собой центральный орган сердечно-сосудистой системы и функционирует как мощный мышечный насос. Оно состоит из четырёх камер: правого и левого предсердий, а также правого и левого желудочков. Камеры сердца разделены перегородками и снабжены клапанным аппаратом, обеспечивающим однонаправленный ток крови.

Сосудистая система включает артерии, вены и капилляры. Артерии транспортируют кровь от сердца к органам, вены возвращают её обратно, а капилляры обеспечивают обмен веществ между кровью и тканями. Слаженная работа сердца и сосудов обеспечивает поддержание постоянного кровообращения и гемодинамического равновесия.

Функционирование сердечно-сосудистой системы регулируется нервной и гуморальной системами. Нарушения регуляции могут стать причиной развития различных патологических состояний, включая аритмии, гипертонию и сердечную недостаточность.

Общая характеристика заболеваний сердечно-сосудистой системы

Заболевания сердечно-сосудистой системы представляют собой обширную группу патологий, затрагивающих сердце и кровеносные сосуды. К наиболее распространённым относятся ишемическая болезнь сердца, артериальная гипертензия, сердечная недостаточность, нарушения ритма и проводимости, а также заболевания периферических сосудов.

Эти заболевания характеризуются хроническим течением и нередко приводят к развитию тяжёлых осложнений, таких как инфаркт миокарда и инсульт. Существенную роль в их возникновении играют факторы риска, включая наследственную предрасположенность, гиподинамию, неправильное питание, курение и психоэмоциональное перенапряжение.

Понятие и классификация врождённых пороков сердца

Врождённые пороки сердца — это анатомические дефекты структуры сердца и крупных сосудов, возникающие в период эмбрионального развития. Они формируются в результате нарушения нормального процесса закладки и дифференцировки сердечных структур.

В клинической практике врождённые пороки сердца принято классифицировать на простые и сложные, а также на «цианотические» и «ацианотические». К наиболее распространённым порокам относятся дефекты межпредсердной и межжелудочковой перегородок, открытый артериальный проток, коарктация аорты и тетрада Фалло.

Этиология и патогенез врождённых пороков сердца

Причины возникновения врождённых пороков сердца носят многофакторный характер. Важную роль играют генетические мутации, хромосомные аномалии, инфекционные заболевания матери во время беременности, а также воздействие токсических веществ и лекарственных препаратов.

Патогенез врождённых пороков сердца связан с нарушением нормального кровотока и изменением внутрисердечной гемодинамики. В зависимости от характера дефекта может наблюдаться перегрузка отдельных камер сердца, гипоксия тканей и развитие сердечной недостаточности.

Клинические проявления и диагностика

Клиническая картина врождённых пороков сердца варьирует в зависимости от вида и степени выраженности дефекта. У пациентов могут наблюдаться одышка, быстрая утомляемость, цианоз кожных покровов, задержка физического развития и частые респираторные инфекции.

Современная диагностика включает эхокардиографию, электрокардиографию, рентгенографию органов грудной клетки и магнитно-резонансную томографию. Ранняя диагностика имеет решающее значение для выбора оптимальной тактики лечения.

Заключение

Заболевания сердечно-сосудистой системы и врождённые пороки сердца остаются одной из наиболее значимых проблем здравоохранения. Их высокая распространённость, тяжесть течения и риск развития осложнений требуют

комплексного подхода к диагностике, лечению и профилактике. Ранняя диагностика и внедрение современных медицинских технологий позволяют существенно улучшить прогноз и качество жизни пациентов.

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BONE REGENERATION IN DENTAL IMPLANTOLOGY: MODERN BIOMATERIALS AND THEIR EFFECTIVENESS

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Abstract. Bone regeneration is a critical factor for the long-term success of dental implant therapy, particularly in patients with insufficient alveolar bone volume. Recent advances in biomaterial science have led to the development of innovative materials designed to enhance bone healing and osseointegration around dental implants. This article reviews modern biomaterials used in bone regeneration, including bioactive ceramics, polymers, composites, and bone graft substitutes. Special attention is given to their biological properties, mechanisms of action, and clinical effectiveness. Current research indicates that modern biomaterials significantly improve bone regeneration outcomes by promoting osteoconduction, osteoinduction, and biocompatibility. The findings highlight the importance of material selection in implant dentistry and emphasize the potential of advanced biomaterials to improve implant stability and long-term clinical success.

Keywords: bone regeneration, dental implantology, biomaterials, osseointegration, bone graft substitutes, regenerative dentistry.

INTRODUCTION

Bone regeneration plays a fundamental role in the success of dental implant therapy, as adequate bone volume and quality are essential for achieving long-term implant stability and osseointegration. However, bone loss caused by periodontal disease, trauma, congenital defects, or prolonged tooth loss often limits the possibility of implant placement. Conventional implant techniques may fail in such conditions, making bone augmentation and regenerative procedures a critical component of modern implant dentistry [1].

In recent years, significant progress has been made in the development of biomaterials designed to support and enhance bone regeneration. Unlike traditional grafting approaches, modern biomaterials are engineered to interact with biological tissues by promoting osteoconduction, osteoinduction, and, in some cases, osteogenesis. These materials not only serve as scaffolds for new bone formation but also actively participate in cellular signaling and tissue remodeling processes [2].

Advances in material science and regenerative medicine have led to the introduction of bioactive ceramics, polymer-based materials, composite biomaterials, and bone

graft substitutes with improved biological and mechanical properties. According to current research, the appropriate selection and application of these biomaterials significantly influence bone healing outcomes and implant success rates. Therefore, understanding the mechanisms and effectiveness of modern biomaterials is essential for optimizing bone regeneration strategies in dental implantology.

Literature Review

According to Albrektsson and Johansson, successful bone regeneration in implant dentistry depends on the interaction between biomaterials and biological tissues through osteoconduction, osteoinduction, and osseointegration mechanisms [3]. In their work, the authors emphasize that biomaterials used for bone augmentation must provide a stable scaffold while simultaneously supporting cellular attachment and new bone formation.

As stated by Buser et al., guided bone regeneration (GBR) has become one of the most widely applied techniques in implantology due to the development of biocompatible membranes and bone graft materials [4]. The authors highlight that modern biomaterials significantly improve bone volume and density around implants, leading to higher implant survival rates. Their findings underline the importance of barrier membranes and graft materials in preventing soft tissue invasion and promoting osteogenesis.

According to Giannoudis et al., bioactive ceramics such as hydroxyapatite and beta-tricalcium phosphate play a crucial role in bone regeneration because of their chemical similarity to natural bone tissue [5]. In their research, it is stated that these materials exhibit excellent osteoconductive properties and gradually integrate with host bone, making them suitable for implant-related regenerative procedures.

As described in the work of Sheikh et al., polymer-based and composite biomaterials offer additional advantages, including controlled degradation rates and enhanced mechanical flexibility [6]. The authors note that composite biomaterials combining ceramics and polymers demonstrate improved biological performance by supporting both structural stability and cellular activity during bone healing.

Furthermore, according to Zhang and co-authors, nanostructured biomaterials represent a significant advancement in bone regeneration strategies [7]. Their studies show that nanoscale surface modifications enhance protein adsorption, cell adhesion, and differentiation, ultimately accelerating bone regeneration and improving implant osseointegration. These findings suggest that nanotechnology-based biomaterials hold great potential for future applications in implant dentistry.

Methodology

This study is based on a comprehensive review and qualitative analysis of recent scientific literature related to bone regeneration in dental implantology. Peer-reviewed articles, books, and clinical trial reports were selected from international databases focusing on biomaterials, tissue engineering, and regenerative dentistry. The selected studies were analyzed to identify the types of modern biomaterials, their biological and mechanical properties, and their effectiveness in promoting bone regeneration. Comparative evaluation was conducted to assess the performance of different biomaterial systems in terms of osteoconduction, osteoinduction, and clinical outcomes. The results were synthesized to provide an integrated overview of current trends and future perspectives in bone regenerative strategies for dental implants.

Results and Discussion

The analysis of current research highlights that modern biomaterials significantly enhance bone regeneration outcomes in dental implantology. According to Albrektsson and Johansson, successful bone augmentation is achieved when biomaterials facilitate osteoconduction, osteoinduction, and stable osseointegration, which are critical for long-term implant success [8]. These mechanisms ensure that newly formed bone not only provides structural support but also integrates biologically with the surrounding tissues.

Several studies indicate that bioactive ceramics, such as hydroxyapatite (HA) and beta-tricalcium phosphate (β -TCP), serve as highly effective scaffolds due to their chemical similarity to natural bone [9]. Bioactive ceramics promote cellular adhesion, proliferation, and differentiation, which accelerate bone matrix deposition and mineralization around implants. Furthermore, composite biomaterials combining ceramics and polymers demonstrate both mechanical stability and enhanced biological performance, supporting osteogenesis while maintaining scaffold integrity.

Nanostructured biomaterials represent another advancement in bone regeneration strategies. As reported by Zhang et al., the incorporation of nanoscale features enhances protein adsorption, improves cell adhesion, and stimulates osteoblastic activity, leading to faster and more uniform bone formation [10]. These nanostructured scaffolds have shown superior clinical performance, especially in patients with compromised bone conditions, due to their ability to mimic the natural extracellular matrix and provide optimized microenvironments for tissue regeneration.

The comparative evaluation of different biomaterials reveals clear distinctions in regenerative potential, bioactivity, and clinical outcomes. The data summarized in Table 1 illustrate these differences and highlight the advantages of modern biomaterials over conventional grafting materials.

Table 1.

Comparative Characteristics of Modern Bone Regenerative Biomaterials

Material Type	Bioactivity	Osteoconduction	Osteoinduction	Mechanical Strength	Clinical Effectiveness
Autografts	High	Yes	Yes	Moderate	Excellent
Allografts	Moderate	Yes	Limited	Moderate	Good
Bioactive Ceramics (HA, β -TCP)	High	Yes	Moderate	High	Very Good
Polymer-Ceramic Composites	High	Yes	Moderate	High	Very Good
Nanostructured Biocomposites	Very High	Yes	High	High	Excellent

Overall, the results demonstrate that modern biomaterials provide a multifunctional approach to bone regeneration, integrating both biological activity and mechanical stability. Bioactive ceramics and nanostructured composites not only serve as scaffolds but also actively stimulate cellular processes crucial for osteogenesis. According to Sheikh et al., the choice of biomaterial has a direct influence on bone healing kinetics, implant osseointegration, and long-term clinical success [11]. The integration of advanced biomaterials with tissue engineering principles represents a key factor in improving outcomes in dental implantology.

Conclusion

The analysis of current research indicates that modern biomaterials play a pivotal role in enhancing bone regeneration for dental implantology. Bioactive ceramics, polymer-ceramic composites, and nanostructured biomaterials provide both mechanical stability and biological functionality, promoting osteoconduction, osteoinduction, and improved osseointegration. Nanostructured scaffolds, in particular, demonstrate superior cellular interactions and accelerated bone formation, making them highly effective in challenging clinical scenarios. Overall, the appropriate selection and application of these advanced biomaterials significantly improve bone healing outcomes, implant stability, and long-term clinical success. Continued research and

clinical validation are essential to further optimize biomaterial designs and expand their applications in regenerative implant dentistry.

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MORPHOLOGY OF EYEBALL AND EYELID EPITHELIAL TUMORS IN DIFFERENT STAGES OF GLAUCOMA.

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Relevance of the topic: Among ophthalmological diseases, glaucoma is a neurodegenerative disease that leads to a gradual loss of vision, in the pathogenesis of which, along with increased intraocular pressure, morphofunctional changes in the sclera tissue play an important role. At the same time, the trophic state of the eyelid skin and epithelial structures may change at different stages of glaucoma, creating a morphological basis for the development of epithelial tumors. This issue has been poorly studied in the field of ophthalmology, and its comprehensive morphological analysis is urgent.

The aim of the study: the aim of the study was to evaluate the morphological changes of sclera and eyelid epithelial tumors at different stages of glaucoma.

Materials and methods of the study: Biopsies of scleral tissue and eyelid epithelial tumors taken from patients who underwent surgery for glaucoma stages I–IV were used as the study material. During the study, histological analysis was performed using hematoxylin-eosin staining. Morphometric parameters were assessed by collagen fiber thickness, fibroblast density, and the degree of epithelial cell atypia.

Results of the study: According to the results of the study, in the early stages of glaucoma, collagen fibers were regenerated in the sclera and the activity of fibroblasts increased. In the late stages of the disease, sclerosis, hyalinosis and microcirculatory changes were detected. Epithelial hyperplasia, acanthosis, and in some cases signs of cell atypia were observed in eyelid epithelial tumors. In the advanced stages of glaucoma, a tendency of increased proliferative activity was noted in epithelial tumors.

Conclusion: in conclusion, it can be said that morphological changes in the sclera of the eye at different stages of glaucoma affect the trophic state of the epithelial structures of the eyelid. The identified morphological features are a significant and important factor in the early diagnosis and prevention of eyelid epithelial tumors in patients with glaucoma.

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Mavzuning dolzarbligi: Havotomchi yo'li bilan yuqadigan infeksiyalar bugungi kunda jahon sog'liqni saqlash tizimida muhim muammolardan biri hisoblanadi. Ushbu kasalliklar yuqori yuqumliligi, tez tarqalishi va og'ir asoratlar keltirib chiqarishi bilan xavflidir. Qizamiq eng yuqumli virusli kasalliklardan biri bo'lib, asosan bolalar orasida keng tarqaladi. Immuniteti past shaxslarda kasallik og'ir kechadi va o'lim bilan yakunlanishi ham mumkin. Jahon sog'liqni saqlash tashkiloti ma'lumotlariga ko'ra, vaksina bilan qamrab olish darajasining pasayishi qizamiq bilan kasallanish holatlarining ortishiga sabab bo'lmoqda. Sanitariya-gigiyena qoidalariga rioya qilmaslik ham kasallik tarqalishiga ijobiy sharoit yaratadi.

Tadqiqot maqsadi: Ushbu ilmiy ishning asosiy maqsadi — qizamiq kasalligining kelib chiqish sabablari, tarqalish mexanizmi, klinik belgilari, tashxislash, davolash hamda oldini olish choralarini o'rganish va tahlil qilishdan iborat.

Tadqiqot material va usullari: Tadqiqot jarayonida JSST, CDC, PubMed, Elsevier, Scopus kabi xalqaro ilmiy bazalardagi maqolalar, statistik ma'lumotlar va zamonaviy adabiyotlar tahlil qilindi. 2022–2025-yillarda mahalliy tibbiyot muassasalarida kuzatilgan bemorlar holatlari o'rganildi. Klinik, laborator va epidemiologik tadqiqot usullaridan foydalanildi. Havotomchi yo'li bilan yuqadigan infeksiyalar yo'tal, aksirish va gapirish vaqtida ajraladigan mayda tomchilar orqali tarqaladi. Ular asosan nafas yo'llarini zararlab, qisqa vaqt ichida keng hududga tarqalishi mumkin. Etiologiyasi qizamiq kasalligining qo'zg'atuvchisi — Measles virus bo'lib, Paramyxoviridae oilasiga mansub. Virus tashqi muhitga nisbatan chidamsiz

bo'lib, asosan to'g'ridan-to'g'ri havo-tomchi yo'li bilan yuqadi. Virus nafas yo'llari shilliq qavati orqali organizmga kirib, qon orqali butun tanaga tarqaladi va immun tizimni zaiflashtiradi. Epidemiologiyasi qizamiq ko'proq bolalarda uchraydi. Kasallik yilning qish va bahor fasllarida ko'payadi. Aholining vaksinalanmagan qismi orasida epidemiyalar tez-tez kuzatiladi. Vaksinatsiya qilinmagan shaxslarda kasallik og'ir kechib, asoratlari ko'p uchraydi. Inkubatsion davri qizamiqning inkubatsion davri o'rtacha 7 kundan 14 kungacha davom etadi. Ushbu davrda kasallik belgilari aniq namoyon bo'lmaydi, ammo bemor yuqumli hisoblanadi. Qizamiq quyidagi belgilar bilan namoyon bo'ladi: tana haroratining ko'tarilishi, umumiy holsizlik va charchoq, yo'tal va burun oqishi, ko'zlarning qizarishi (konyunktivit), og'iz shilliq qavatida terida qizil rangli toshmalar, ishtahaning pasayishi. Qizamiq quyidagi asoratlarni keltirib chiqarishi mumkin: pnevmoniya, bronxit, otit, ensefalit, nafas yetishmovchiligi, immunitetning pasayishi. Og'ir hollarda kasallik nogironlik yoki o'lim bilan yakunlanishi mumkin.

Kasallikni aniqlashda quyidagi usullar qo'llaniladi: klinik ko'rik, epidemiologik anamnez, serologik tekshiruv, PSR diagnostika, umumiy qon tahlili, rentgen tekshiruvi. Davolash: Qizamiqni davolash asosan simptomatik va kompleks tarzda olib boriladi. Isitmani tushiruvchi preparatlar virusga qarshi vositalar A vitamini suyuqlik iste'molini oshirish yotoq rejimi, parhez, toza havo muhitini ta'minlash. Og'ir hollarda statsionar sharoitda davolash talab etiladi. Kasallikning oldini olish. Qizamiqning oldini olishda quyidagi choralar muhim hisoblanadi: MMR vaksina bilan emlash shaxsiy gigiyena qoidalariga rioya qilish. Xonalarni muntazam shamollatish, bemorlarni izolyatsiya qilish, aholini tibbiy savodxonligini oshirish.

Olingan natijalar: Tadqiqot natijalari shuni ko'rsatdiki, vaksina bilan qamrab olish darajasi yuqori bo'lgan hududlarda qizamiq kam uchraydi. Vaksinatsiya qilinmagan bolalarda kasallikning og'ir shakllari va asoratlari ko'proq kuzatilgan. Erta tashxis va to'g'ri parvarish davolash samaradorligini oshiradi.

Xulosa: Qizamiq havo-tomchi yo'li bilan yuqadigan xavfli virusli kasallik bo'lib, jamiyat salomatligi uchun jiddiy tahdid hisoblanadi. Kasallikni erta aniqlash, samarali davolash, vaksinalardan to'liq foydalanish hamda sanitariya-gigiyena qoidalariga amal qilish orqali uning oldini olish mumkin. Aholining tibbiy savodxonligini oshirish va profilaktik choralarni kuchaytirish muhim ahamiyatga ega.

ROLE OF HYPERURICEMIA AND RENIN-ANGIOTENSIN-ALDOSTERONE SYSTEM ACTIVATION IN RENAL DYSFUNCTION

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Abstract: This study is dedicated to investigating hyperuricemia and its associated renal dysfunction mechanisms. Hyperuricemia, characterized by elevated uric acid levels, induces oxidative stress, inflammation, and tubulointerstitial injury. In addition, activation of the renin-angiotensin-aldosterone system (RAAS) exacerbates glomerular and tubular damage, leading to proteinuria, interstitial fibrosis, and glomerulosclerosis. Experimental and clinical studies demonstrate that lowering uric acid levels and modulating RAAS can prevent the decline in kidney function and slow the progression of chronic kidney disease. The results of this work can be applied in the treatment and prevention of patients with hyperuricemia, as well as in guiding clinical management strategies.

Keywords: Hyperuricemia, uric acid, renal dysfunction, RAAS, oxidative stress, inflammation, tubulointerstitial injury, proteinuria.

INTRODUCTION

Hyperuricemia, characterized by elevated levels of uric acid in the blood, is a common metabolic disorder associated not only with gout but also with cardiovascular and renal dysfunction. Recent studies suggest that high uric acid levels can induce oxidative stress, promote inflammation, and contribute to tubulointerstitial damage in the kidneys. Moreover, hyperuricemia has been shown to activate the renin-angiotensin-aldosterone system (RAAS), which may exacerbate glomerular and tubular dysfunction. RAAS plays a crucial role in regulating blood pressure, fluid balance, and renal perfusion. Persistent activation of this system can lead to decreased glomerular filtration rate, interstitial fibrosis, and progressive kidney injury. In the context of hyperuricemia, RAAS activation may serve as a key pathogenetic factor in the development of renal dysfunction.

Relevance

Hyperuricemia is increasingly recognized as a risk factor for kidney dysfunction and cardiovascular diseases. Its prevalence is rising due to lifestyle and metabolic changes. Activation of the renin-angiotensin-aldosterone system (RAAS) is a key mechanism linking high uric acid levels to renal injury. Studying RAAS involvement in hyperuricemia is important for understanding kidney damage mechanisms and improving prevention and treatment strategies.

Main part

Hyperuricemia is characterized by elevated uric acid levels in the blood, which can have multiple harmful effects on the kidneys. Elevated uric acid promotes oxidative stress, leading to the production of reactive oxygen species that damage renal cells. Chronic hyperuricemia stimulates inflammatory pathways, increasing the levels of pro-inflammatory cytokines and chemokines. Endothelial dysfunction occurs as a result of decreased nitric oxide availability, impairing renal microcirculation. Uric acid can directly injure tubular cells and contribute to crystal deposition in renal tissues. These changes cause tubular apoptosis and interstitial fibrosis. Glomerular function is affected through increased intraglomerular pressure and glomerular hypertension. Proteinuria is a common consequence of these hemodynamic and structural alterations. Hyperuricemia induces the expression of growth factors that further promote fibrosis and inflammation. The combination of oxidative stress, inflammation, and hemodynamic changes accelerates the decline of renal function. Experimental studies have shown that reducing uric acid levels can partially reverse renal damage. Tubulointerstitial injury progresses over time, leading to chronic kidney disease. Hyperuricemia also alters renal autoregulation and blood flow distribution. The imbalance between vasodilatory and vasoconstrictive factors exacerbates kidney injury. Mesangial cell proliferation contributes to glomerular sclerosis. Oxidative stress damages mitochondrial function in tubular cells. Chronic injury leads to nephron loss and decreased filtration rate. Understanding these mechanisms is essential for identifying therapeutic targets. Preventive strategies can reduce the progression of kidney disease in patients with high uric acid. Comprehensive knowledge of hyperuricemia-induced renal pathology is necessary for clinical management and research.

The renin-angiotensin-aldosterone system is a key regulator of blood pressure, electrolyte balance, and renal perfusion. Hyperuricemia stimulates renin release from juxtaglomerular cells in the kidneys. Increased renin leads to higher levels of angiotensin II, which causes vasoconstriction and increases glomerular pressure. Angiotensin II also promotes inflammation and fibrosis in renal tissues. Aldosterone

secretion is enhanced, resulting in sodium retention and further kidney stress. Chronic activation of this system contributes to glomerular hypertension and proteinuria. Experimental models demonstrate that RAAS activation accelerates tubular injury and interstitial fibrosis. Cellular pathways such as mitogen-activated protein kinases are triggered, promoting apoptosis and inflammatory cytokine production. Patients with high uric acid often show elevated plasma renin and aldosterone levels. Persistent RAAS activation is closely linked to the progression of chronic kidney disease. Pharmacological blockade of RAAS reduces glomerular hypertension and interstitial damage. Angiotensin receptor blockers and angiotensin-converting enzyme inhibitors have protective effects on kidney structure and function. RAAS modulation can mitigate oxidative stress and endothelial dysfunction. Hyperuricemia-induced RAAS overactivity represents a critical pathogenetic mechanism of renal injury. Early detection of RAAS activation may improve prognosis in patients with elevated uric acid. Targeting RAAS provides an opportunity to slow kidney damage progression. Combined therapy with uric acid-lowering agents enhances renal protection. Understanding RAAS involvement helps guide clinical management. RAAS activation links metabolic disorders to structural and functional kidney damage. Research on RAAS pathways may reveal novel therapeutic strategies for hyperuricemia-associated kidney disease.

Hyperuricemia and RAAS-mediated renal injury have significant clinical consequences. Chronic kidney disease associated with elevated uric acid often progresses silently. Early detection through laboratory assessment of uric acid and kidney function is essential. Lifestyle interventions, including dietary modification and physical activity, can reduce uric acid levels. Pharmacological therapy with xanthine oxidase inhibitors lowers uric acid and improves endothelial function. Angiotensin-converting enzyme inhibitors and angiotensin receptor blockers reduce RAAS-mediated renal injury. Combined therapy targeting both uric acid and RAAS may provide synergistic renal protection. Treatment plans should be individualized based on patient comorbidities and risk factors. Monitoring therapy effectiveness helps prevent progression to end-stage renal disease. Novel agents targeting aldosterone signaling are under investigation. Reducing inflammation and oxidative stress improves kidney outcomes. Control of blood pressure complements uric acid-lowering strategies. Regular follow-up allows timely adjustment of medications. Early intervention reduces the burden of chronic kidney disease. Prevention of glomerular and tubular injury improves long-term renal function. Integrated management of hyperuricemia and RAAS overactivity is essential for patient care. Clinical trials demonstrate the efficacy of combined pharmacological approaches. Understanding

pathogenetic mechanisms informs evidence-based therapy. Education of patients on lifestyle modification enhances treatment success. Optimal management may reduce morbidity and improve quality of life in affected patients.

Conclusion

Hyperuricemia is a significant factor in the development of kidney dysfunction, primarily through oxidative stress, inflammation, and vascular injury. The activation of the renin-angiotensin-aldosterone system further exacerbates glomerular and tubular damage, promoting fibrosis and progressive loss of renal function. Clinical and experimental studies show that controlling uric acid levels and modulating RAAS activity can reduce renal injury and slow disease progression. Early diagnosis, lifestyle modification, and targeted pharmacological therapy are essential for protecting kidney health in hyperuricemic patients. Understanding these mechanisms provides a foundation for developing effective therapeutic strategies and improving patient outcomes.

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FREQUENCY OF ELEVATED URIC ACID LEVELS AMONG YOUNG PEOPLE

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Abstract: This study investigates the prevalence of elevated uric acid levels (hyperuricemia) among young individuals and its impact on kidney function. Hyperuricemia, even in asymptomatic cases, can serve as an early marker of metabolic disturbances and subclinical renal dysfunction. The findings highlight the distribution of hyperuricemia in youth, the contributing factors, and emphasize the need for preventive measures and lifestyle interventions. The results are important for developing strategies aimed at preserving kidney health and reducing the risk of chronic diseases in young populations.

Keywords: Hyperuricemia, Uric acid, Kidney function, Metabolic disturbances, Preventio.

INTRODUCTION

Uric acid is the final product of purine metabolism and plays an important role in the body's metabolic processes. An increase in its blood levels, known as hyperuricemia, is becoming an increasingly relevant issue even among young people. Although youth is traditionally considered a period of high physiological compensation, recent studies show a rising trend in elevated uric acid levels in this group. Even in the absence of clinical symptoms, elevated uric acid may serve as a marker of subclinical metabolic disturbances and early functional changes in the kidneys. Understanding the factors that influence uric acid levels in young individuals, as well as its prevalence, is important for preventing future cardiovascular and renal complications.

Relevance

The prevalence of hyperuricemia among young people is increasing in many countries and is associated with lifestyle changes, unhealthy diets, reduced physical activity, and genetic predisposition. Even moderate increases in uric acid can affect the endothelium of renal vessels and impair microcirculation. Studying the prevalence of hyperuricemia in youth helps identify risk groups, develop preventive measures, and enable timely correction of contributing factors. The relevance of this research is supported by the need for early detection of metabolic disturbances, prevention of chronic kidney diseases, and maintenance of overall health in young populations.

Main part

Uric acid is the final product of purine metabolism and plays an important role in maintaining the body's antioxidant defense system. At normal levels, it neutralizes free radicals, protecting cells and tissues, including renal and vascular structures, from oxidative damage. However, when serum uric acid levels rise, it can act as a pro-oxidant, promoting oxidative stress, inflammation, and endothelial dysfunction in the renal microvasculature. Among young individuals, elevated uric acid levels are often associated with dietary habits, including high consumption of purine-rich foods and fructose-

containing beverages, low physical activity, stress, and genetic predispositions. Even subclinical increases in uric acid can serve as an early warning signal for potential metabolic disturbances and initial renal changes. Prolonged mild hyperuricemia may impair glomerular and tubular microcirculation, induce low-grade inflammation, and trigger structural alterations in renal tissue. Research shows that uric acid levels are closely linked to endothelial function and oxidative processes. Monitoring uric acid in young populations is essential for the early detection of metabolic dysfunction. Awareness of uric acid's physiological and pathological roles allows healthcare providers to implement preventive strategies. These strategies aim to preserve renal and vascular health in youth and prevent long-term complications associated with hyperuricemia. Understanding the biochemical mechanisms also helps guide lifestyle and dietary recommendations to reduce future disease risk. Early recognition of elevated uric acid is therefore a cornerstone of preventive medicine in young adults.

Epidemiological studies conducted in various countries indicate that the prevalence of hyperuricemia among young individuals varies widely depending on socio-economic conditions, lifestyle, diet, and physical activity levels. Current research suggests that 10–25% of young adults have serum uric acid levels above the normal range, with a growing trend in recent years. Elevated uric acid levels are more frequently observed in individuals with obesity, sedentary lifestyles, and diets high in purines. Differences in prevalence are also noted between males and females, likely due to hormonal influences and metabolic differences. These findings highlight the importance of including uric acid measurement in routine preventive medical examinations. Population-level prevalence data help identify risk groups, allowing for timely interventions. Understanding the demographic, lifestyle, and nutritional factors contributing to hyperuricemia enables the design of targeted public health strategies. Early identification at the population level can prevent the future development of chronic kidney disease, hypertension, and cardiovascular disorders. Regular epidemiological monitoring provides insight into the impact of modern lifestyle habits on youth health. It also allows for forecasting long-term trends in the incidence of metabolic and renal disorders. Accurate prevalence data support clinicians and policymakers in planning educational and preventive programs for young populations. Overall, monitoring the frequency of elevated uric acid among youth is critical for public health and preventive medicine.

Detecting elevated uric acid levels in young individuals has important clinical and preventive implications. Early identification allows healthcare providers to recommend lifestyle modifications, including dietary adjustments, increased physical activity, weight management, and reduction of risk behaviors. Limiting intake of purine-rich foods, sugary drinks, and alcohol can directly lower uric acid concentrations. Regular physical activity improves renal perfusion, metabolic health, and helps manage body weight. Monitoring uric acid alongside renal function parameters, such as glomerular filtration rate, serum creatinine, and urea, provides a comprehensive assessment of early subclinical changes. Individualized recommendations can prevent the progression of metabolic disturbances and reduce the risk of chronic kidney disease, hyperuricemic nephropathy, and associated cardiovascular complications. Educational programs targeting youth on nutrition, physical activity, and healthy habits reinforce preventive measures. Routine uric acid screening as part of medical check-ups allows early identification of at-risk individuals and supports timely interventions. Public health strategies informed by prevalence and risk factor data can improve population-level health outcomes. Preventive management in youth reduces future healthcare burdens and promotes long-term

metabolic and renal health. Overall, integrating uric acid monitoring into routine assessments is an effective approach to preserving youth health and preventing chronic diseases later in life.

Conclusion

Hyperuricemia among young individuals is an increasingly important metabolic concern, even in the absence of overt clinical symptoms. Elevated serum uric acid levels can serve as an early marker of subclinical metabolic disturbances and potential kidney dysfunction. Monitoring uric acid, alongside renal function parameters, allows for the timely identification of at-risk youth and the implementation of preventive interventions. Lifestyle modifications, including dietary adjustments, increased physical activity, and weight management, can help mitigate the risk associated with elevated uric acid. Early detection and preventive strategies are crucial for reducing the future burden of chronic kidney disease and cardiovascular complications. Understanding the prevalence and influencing factors of hyperuricemia in young populations provides valuable insight for public health strategies and personalized healthcare recommendations, supporting long-term metabolic and renal health.

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CLINICAL FEATURES OF CHRONIC KIDNEY DISEASE IN YOUNG PATIENTS

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Annotation: Chronic kidney disease in young patients is an increasingly recognized health problem with unique clinical characteristics and challenges. The disease often develops silently, with minimal or no early symptoms, which delays diagnosis and allows progressive kidney damage. Both genetic and congenital factors, as well as lifestyle-related risks such as hypertension, diabetes, and obesity, contribute to disease development. Early identification, regular monitoring, and targeted interventions are essential for slowing disease progression, preventing complications, and improving long-term outcomes. Multidisciplinary care and patient education play a crucial role in managing the condition effectively. Understanding the clinical features and risk factors in young patients supports better prevention strategies, timely treatment, and improved quality of life.

Keywords: Chronic kidney disease; Young patients; Clinical features; Early diagnosis; Risk factors; Disease progression; Kidney function.

Introduction

Chronic kidney disease is an important global health problem that affects the quality of life of patients and increases the risk of cardiovascular complications. Although this condition is usually associated with older adults, it is increasingly observed in young people due to the growing prevalence of risk factors such as high blood pressure, diabetes mellitus, obesity, and congenital or inherited kidney disorders. In young patients, chronic kidney disease often develops slowly without noticeable symptoms, which makes early diagnosis difficult. Even at the initial stages, kidney damage can progress over time and eventually lead to complete loss of kidney function, requiring dialysis treatment or kidney transplantation. Early detection of impaired kidney function, careful monitoring of laboratory indicators, and identification of risk factors that can be modified are essential for preventing rapid progression of the disease.

Studying the clinical features of chronic kidney disease in young patients allows researchers and clinicians to understand the mechanisms of disease progression, develop effective strategies for early diagnosis, and optimize preventive and therapeutic measures. Attention to lifestyle, coexisting conditions, and subtle laboratory changes is critical for improving long-term outcomes in this population.

Main part

Chronic kidney disease among young patients is becoming increasingly recognized as a significant public health concern. Epidemiological studies indicate that although the prevalence is lower than in older adults, the incidence in adolescents and young adults is rising. This trend is associated with lifestyle-related risk factors such as high blood pressure, diabetes mellitus, obesity, poor diet, and smoking. In addition, congenital abnormalities of the kidney and urinary tract, inherited kidney disorders, and exposure to nephrotoxic medications contribute to the development of kidney disease at a young age. Early identification of these risk factors is critical for preventing progression and reducing long-term complications. Research has shown that the presence of comorbidities, including cardiovascular disease and metabolic syndrome, significantly increases the risk of early kidney function decline. Social and environmental factors, including limited access to healthcare and lack of awareness about kidney health, further exacerbate the burden of disease. Screening programs targeting at-risk populations can provide an opportunity for early detection and intervention. Laboratory tests such as serum creatinine, estimated glomerular filtration rate, and urine protein analysis are essential tools for identifying kidney damage. Preventive strategies including lifestyle modification, blood pressure control, and management of metabolic disorders are central to reducing the incidence of chronic kidney disease in young patients. Genetic counseling is also important for families with a history of kidney disorders. The early recognition of high-risk individuals allows clinicians to implement monitoring and treatment strategies to slow disease progression. Longitudinal studies demonstrate that addressing modifiable risk factors at a young age can significantly improve long-term outcomes. Educational initiatives in schools and communities can raise awareness and promote kidney health. The integration of multidisciplinary care teams, including nephrologists, dietitians, and psychologists, can support young patients in managing their condition. Research continues to explore novel biomarkers and predictive models for early identification of at-risk individuals. Public health policies emphasizing prevention and early intervention are essential to reduce the growing burden of chronic kidney disease in young populations. Early intervention has the potential to delay the onset of end-stage kidney disease and improve quality of life.

Understanding epidemiological patterns is crucial for planning healthcare services and allocating resources effectively.

The clinical manifestations of chronic kidney disease in young patients often differ from those in older adults. In the early stages, the disease is frequently asymptomatic, which delays diagnosis and allows kidney damage to progress unnoticed. Common early signs include fatigue, mild swelling of the lower extremities, changes in urine volume, and subtle alterations in blood pressure. Laboratory abnormalities may appear before clinical symptoms, highlighting the importance of regular screening in high-risk populations. As the disease advances, young patients may develop more noticeable symptoms such as persistent edema, hypertension, proteinuria, and electrolyte imbalances. The progression of kidney damage can be accelerated by uncontrolled risk factors, including high blood pressure, diabetes, and obesity. Early intervention can slow the rate of decline in kidney function and prevent complications affecting the cardiovascular system and bone metabolism. Disease progression in young patients is also influenced by genetic predisposition, which can determine the rate of glomerular and tubular injury. Monitoring tools such as imaging studies and repeated laboratory tests are essential for assessing disease progression and guiding treatment decisions. Multidisciplinary management, including nephrology care, dietary guidance, and psychological support, is vital to maintain health and prevent rapid deterioration. Timely treatment strategies, including pharmacological interventions and lifestyle modification, can improve prognosis and reduce the risk of end-stage renal disease. Studies indicate that younger patients who receive early and comprehensive care have better long-term outcomes compared to those diagnosed at a later stage. Awareness of subtle clinical signs allows for prompt action, minimizing irreversible kidney injury. Regular follow-up is essential to monitor disease trajectory and adjust therapy as needed. Collaboration between healthcare providers, patients, and families ensures adherence to treatment and healthy lifestyle choices. Research emphasizes that individualized care plans are most effective in managing disease progression in young populations. Preventive strategies should focus on both medical management and education about disease risks and lifestyle factors. Understanding the natural history of chronic kidney disease in young patients helps clinicians anticipate complications and tailor interventions.

Early diagnosis of chronic kidney disease in young patients is critical to prevent rapid progression and long-term complications. Comprehensive evaluation includes a detailed medical history, physical examination, and assessment of risk factors such as family history, comorbidities, and lifestyle influences. Laboratory tests are central to diagnosis, including measurement of serum creatinine, estimated glomerular filtration

rate, urine protein analysis, and electrolyte levels. Imaging studies such as ultrasound, magnetic resonance imaging, or computed tomography may be used to detect structural abnormalities and guide treatment planning. Genetic testing can be considered in cases with suspected hereditary kidney disorders. Management strategies combine lifestyle modification, pharmacological therapy, and monitoring of disease progression. Controlling blood pressure, maintaining healthy body weight, managing diabetes, and limiting exposure to nephrotoxic substances are fundamental preventive measures. Pharmacological interventions, including angiotensin-converting enzyme inhibitors or angiotensin receptor blockers, may help reduce proteinuria and slow kidney damage. Regular follow-up visits are essential to monitor laboratory parameters, detect complications, and adjust therapy. Patient education regarding diet, physical activity, and medication adherence is crucial for successful long-term management. Multidisciplinary care involving nephrologists, dietitians, social workers, and psychologists can provide holistic support. Early referral to specialized centers may improve access to advanced therapies and transplantation when needed. Preventive strategies should be tailored to the individual patient, considering age, comorbidities, and genetic factors. Research into novel biomarkers and therapeutic approaches continues to enhance early detection and optimize treatment outcomes. Encouraging healthy lifestyle habits from childhood can reduce the future burden of chronic kidney disease. Public health initiatives focusing on awareness, screening, and early intervention are essential for improving prognosis in young populations. Understanding the most effective diagnostic and management strategies is key to reducing morbidity, preventing end-stage kidney disease, and improving quality of life in young patients with chronic kidney disease.

Conclusion

Chronic kidney disease in young patients often progresses silently, making early diagnosis difficult. Genetic factors, congenital abnormalities, and lifestyle-related risks contribute to kidney damage. Early detection, regular monitoring, and targeted interventions are essential to slow disease progression. Multidisciplinary care, lifestyle modification, and patient education improve outcomes and quality of life. Understanding the unique clinical features of this population helps clinicians provide effective management and reduce the long-term burden of the disease.

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СВЯЗЬ УРОВНЯ МОЧЕВОЙ КИСЛОТЫ С ПОКАЗАТЕЛЯМИ ФУНКЦИИ ПОЧЕК У МОЛОДЫХ

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Аннотация: В статье рассматривается взаимосвязь уровня мочевой кислоты с функциональными показателями почек у молодых людей. Подчеркивается значение мочевой кислоты как раннего биохимического маркера скрытых нарушений почечной функции. Анализ данных показателей позволяет выявлять группы риска и проводить профилактические мероприятия с целью сохранения здоровья почек в молодом возрасте.

Ключевые слова: Мочевая кислота, функция почек, молодые люди, скорость клубочковой фильтрации.

Введение

Мочевая кислота, как конечный продукт пуринового обмена, играет ключевую роль в регуляции метаболических процессов организма. Почки являются основным органом, ответственным за выведение мочевой кислоты, что обеспечивает тесную взаимосвязь между ее концентрацией в крови и функцией почек. Даже у клинически здоровых молодых людей уровень мочевой кислоты может варьироваться под влиянием питания, физической активности, генетических особенностей и образа жизни. Понимание этой взаимосвязи важно для своевременного выявления скрытых нарушений почечной функции до появления клинических симптомов.

Актуальность

Современные исследования показывают, что повышение уровня мочевой кислоты связано с нарушениями микроциркуляции в почечных клубочках и может быть ранним признаком дисфункции почек. Молодой возраст считается периодом высокой компенсационной способности организма, однако даже незначительные колебания мочевой кислоты способны влиять на показатели фильтрационной функции почек. Изучение данной взаимосвязи позволяет

выявить потенциальные группы риска и определить профилактические меры для сохранения здоровья почек у молодых людей.

Основная часть

Регуляция уровня мочевой кислоты зависит от баланса между ее образованием в организме и выведением почками. Любые нарушения этого баланса могут привести к повышению сывороточного уровня мочевой кислоты, что, в свою очередь, способно оказывать влияние на почечную ткань. Исследования указывают, что даже умеренное повышение мочевой кислоты может сопровождаться изменениями скорости клубочковой фильтрации, концентрации креатинина и показателей экскреции электролитов. Эти изменения не всегда сопровождаются симптомами, что делает лабораторный мониторинг особенно важным.

Показатели функции почек, такие как скорость клубочковой фильтрации, концентрация креатинина и уровень мочевины, служат объективными маркерами состояния почек. У молодых людей взаимосвязь этих показателей с уровнем мочевой кислоты может свидетельствовать о ранних метаболических изменениях и начальных нарушениях почечного кровотока. Мониторинг таких изменений помогает не только диагностировать скрытые нарушения, но и оценить влияние факторов образа жизни, включая рацион, физическую активность и гидратацию организма.

Профилактическое значение выявления взаимосвязи уровня мочевой кислоты и функции почек трудно переоценить. Своевременная коррекция образа жизни и питания, а также регулярное наблюдение лабораторных показателей позволяет снизить вероятность прогрессирования метаболических нарушений и предупредить развитие хронической патологии почек. Комплексный подход к оценке состояния мочевой кислоты и почечной функции становится важным инструментом профилактической медицины для молодых людей.

Заключение

Связь уровня мочевой кислоты с показателями функции почек у молодых людей является актуальной проблемой медицины, так как даже небольшие отклонения могут служить ранним маркером метаболических изменений. Мониторинг этих показателей позволяет своевременно выявлять скрытые нарушения почечной функции и принимать профилактические меры. Таким образом, оценка уровня мочевой кислоты у молодых людей имеет как диагностическое, так и прогностическое значение для сохранения здоровья почек.

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REASONS FOR THE INCREASE IN ANTIBIOTIC RESISTANCE OF MICROORGANISMS

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Relevance:

According to the World Health Organization (WHO), more than 700,000 people die each year due to antibiotic-resistant infections. It is estimated that by 2050, this figure could reach 10 million. This poses a massive threat to the global community, not only medically but also socio-economically. Antibiotic resistance negatively impacts the reliability of healthcare systems, the duration of disease treatment, and overall healthcare costs.

Objective:

The objective of this scientific work is to identify the mechanisms of antibiotic resistance in microorganisms, analyze the reasons for their widespread prevalence, evaluate their impact on the global healthcare system, and examine international approaches to addressing this issue.

Materials and Methods:

The analysis involved studying articles and statistical data (2020–2024) from leading scientific databases such as WHO, CDC (USA), UpToDate, PubMed, Elsevier, and Scopus. Additionally, statistical indicators of bacterial infections observed at the clinical base of TMA (Tashkent Medical Academy) during 2023–2024 were examined. Biological processes related to bacterial resistance mechanisms were analyzed, specifically: the production of beta-lactamase enzymes, efflux pump activity, changes in target protein structures, biofilm formation, and horizontal gene transfer via plasmids.

Results:

Research results indicate that microorganisms such as *Escherichia coli*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, and *Pseudomonas aeruginosa* show

high levels of antibiotic resistance. The highest resistance is observed in the groups of beta-lactams, carbapenems, fluoroquinolones, and aminoglycosides. Observations conducted at the TMA clinical base in 2023–2024 showed that bacterial infections were identified in 38% of patients, with resistance to at least one antibiotic recorded in 52% of those cases. Treatment approaches based on sensitivity (antibiograms) and combined antibiotic use were widely implemented. In some cases, prolonged microbial infections, relapses, and treatment difficulties were found to be directly linked to antibiotic resistance.

Conclusion:

Based on the results obtained, the following conclusions can be drawn: antibiotics should be taken only under a doctor's prescription and for the full course; prevention, sanitation, and hygiene must be strictly followed; scientific research on the development of new antimicrobial drugs should be intensified; microbiological monitoring and control systems must be strengthened; and public medical literacy should be increased.

YURAK-QON TOMIR OPERATSIYALARIDA ANESTEZIYA JARAYONIDA DOLZARB MASALALAR VA ULRINING YECHIMLARI

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Annotatsiya: Yurak-qon tomir operatsiyalarida anesteziya bemorning xavfsizligi va postoperatsion natijalarga bevosita ta'sir qiladi. Ushbu maqolada gemodinamik monitoring, antikoagulyatsiya nazorati, organ himoyasi, multimodal sedatsiya va postoperatsion delirium kabi dolzarb masalalar tahlil qilinib, ularning zamonaviy yechimlari taqdim etilgan. Individualizatsiyalangan yondashuv va innovatsion monitoring tizimlari bemor xavfini kamaytirishda muhim ahamiyatga ega.

Kalit so'zlar: Yurak-qon tomir operatsiyalari, anesteziya, gemodinamik monitoring, antikoagulyatsiya, organ himoyasi, postoperatsion delirium

Аннотация: Анестезия при кардиохирургических операциях напрямую влияет на безопасность пациента и послеоперационные результаты. В статье рассмотрены актуальные проблемы, включая гемодинамический мониторинг, контроль антикоагуляции, защиту органов, мультимодальную седацию и послеоперационное делирий, а также предложены современные решения. Индивидуализированный подход и инновационные системы мониторинга имеют важное значение для снижения риска для пациента.

Ключевые слова: Кардиохирургические операции, анестезия, гемодинамический мониторинг, антикоагуляция, защита органов, послеоперационный делирий

Abstract: Anesthesia during cardiovascular surgery directly impacts patient safety and postoperative outcomes. This article analyzes current challenges, including hemodynamic monitoring, anticoagulation management, organ protection, multimodal sedation, and postoperative delirium, and presents contemporary solutions. Individualized approaches and innovative monitoring systems play a crucial role in reducing patient risk.

Keywords: Cardiovascular surgery, anesthesia, hemodynamic monitoring, anticoagulation, organ protection, postoperative delirium

Yurak-qon tomir operatsiyalari (coronary artery bypass grafting – CABG, valvulyar operatsiyalar, aorta jarayonlari va boshqa murakkab kardioxirurgik amaliyotlar) bugungi kunda kardiologiya va kardioxirurgiyaning eng rivojlangan yo‘nalishlaridan biridir. Shu bilan birga, ushbu jarayonlar yuqori riskli hisoblanadi, chunki bemorlarning ko‘pchiligi kardiak va boshqa surunkali kasalliklar bilan birga keladi, masalan, arterial gipertenziya, diabet mellitus, buyrak yetishmovchiligi yoki oldingi miokard infarkti. Anesteziya jarayoni yurak-qon tomir operatsiyalarida bemorning xavfsizligi va postoperatsion natijalariga bevosita ta’sir ko‘rsatadi. Jarayon davomida yuzaga keladigan murakkabliklar va dolzarb masalalar klinik tajriba va zamonaviy texnologiyalar yordamida hal qilinadi. Bularning eng asosiylari quyidagilardan iborat:

1. **Gemodinamik beqarorlik:** Yurak-qon tomir operatsiyalari davomida arterial qon bosimi va yurak chiqishi tez o‘zgaradi, bu esa miya, buyrak va yurak perfuziyasini xavf ostiga qo‘yadi. Gemodinamik monitoring va invaziv/non-invaziv monitoring tizimlari bemorning stabil holatini saqlash uchun zarur.
2. **Antikoagulyatsiya va qon ivishi nazorati:** Kardiopulmonar bypass jarayonida qon ivishi muvozanatini saqlash juda muhim. To‘g‘ri nazorat qilinmasa, bu katta qon yo‘qotishiga yoki trombotik asoratlarga olib kelishi mumkin. Shu sababli, aktivatsiyalangan tromboplastin va trombosit monitoringi, shuningdek, individual antikoagulyant protokollari qo‘llaniladi.
3. **Organ himoyasi:** Operatsiya davomida yurak, buyrak va miya ishemiyasidan himoya qilish uchun kardioplegiya, perfuziya va volemik monitoring strategiyalari qo‘llanadi. Bu usullar postoperatsion asoratlarni kamaytirishga yordam beradi.
4. **Sedatsiya va postoperatsion delirium:** ICU-da bemorlar ko‘pincha uzoq muddatga sedatsiyalanadi, bu esa postoperatsion delirium va uzoq reabilitatsiya davomiyligiga olib keladi. Multimodal sedatsiya va BIS monitoringi kabi zamonaviy yondashuvlar bemorning uyg‘onishini tezlashtiradi va delirium xavfini kamaytiradi.
5. **Individualizatsiyalangan yondashuv:** Har bir bemor o‘ziga xos klinik profilda keladi. Shu sababli, anesteziya strategiyasi individual parametrlar, gemodinamik status, laboratoriya natijalari va comorbiditani hisobga olgan holda ishlab chiqilishi lozim.

Bugungi kunda, zamonaviy anesteziya amaliyotida **innovatsion monitoring tizimlari, multimodal sedatsiya strategiyalari va individualizatsiyalangan protokollar** dolzarb masalalarning samarali yechimlari sifatida qaraladi. Shu bilan birga, sun‘iy intellekt va real-time monitoring algoritmlari bemorning holatini prognozlash va murakkab vaziyatlarda tezkor qarorlar qabul qilish imkoniyatini kengaytirmoqda. Yurak-qon tomir operatsiyalari davomida anesteziya jarayoni

bemorning xavfsizligi va postoperatsion natijalarga bevosita ta'sir qiladi. Jarayon davomida gemodinamik beqarorlik eng ko'p uchraydigan muammolardan biri hisoblanadi. Arterial qon bosimi va yurak chiqishi tez-tez o'zgarib turadi, bu esa miya, buyrak va yurak perfuziyasini xavf ostiga qo'yadi. Zamonaviy monitoring tizimlari, jumladan invaziv va non-invaziv usullar, gemodinamik parametrlarni real vaqt rejimida kuzatish imkonini beradi. Sun'iy intellekt va real-time algoritmlar esa bu deterioratsiyani erta aniqlash va tezkor davolashni ta'minlaydi. Individualizatsiyalangan yondashuv asosida bemorlar uchun optimal volemik va vazopressiya strategiyalari ishlab chiqilgan.

Antikoagulyatsiya nazorati va qon yo'qotishni boshqarish jarayonda alohida e'tibor talab qiladi. Kardiopulmonar bypass paytida qon ivishini muvozanatlash va qon yo'qotishni kamaytirish uchun individual protokollar qo'llanadi. Aktivatsiyalangan tromboplastin va trombosit monitoringi bilan birga hemostatik preparatlar samarali tarzda qo'llanadi, bu esa postoperatsion asoratlarni kamaytirishga yordam beradi. Operatsiya davomida organ himoyasi ham dolzarb masala hisoblanadi. Yurak, buyrak va miya ishemiyasidan himoya qilish uchun kardioplegiya, perfuziya va volemik monitoring strategiyalari qo'llanadi. Shu bilan birga, organ-spesifik himoya protokollari postoperatsion asoratlarni sezilarli darajada kamaytiradi. Multimodal yondashuv va individualizatsiyalangan protokollar bemor xavfini optimallashtiradi. ICU bemorlarida uzoq muddatli sedatsiya postoperatsion delirium xavfini oshiradi. Multimodal sedatsiya va BIS monitoringi sedatsiya darajasini nazorat qilishga, bemorning uyg'onishini tezlashtirishga va delirium xavfini kamaytirishga yordam beradi. Analgeziya va sedatsiyada individual yondashuv, tez-tez neuromonitoring va postoperativ mobilizatsiya bemorning reabilitatsiya jarayonini yaxshilaydi.

Har bir bemor o'ziga xos klinik profilda keladi. Shu sababli anesteziya protokollari individual parametrlar, gemodinamik status, comorbidita va laboratoriya ko'rsatkichlariga qarab ishlab chiqilishi zarur. Innovatsion monitoring tizimlari va predictive algorithms bemorning holatini real vaqt rejimida prognozlash va murakkab vaziyatlarda tezkor qaror qabul qilish imkoniyatini kengaytiradi. Yuqoridagi jihatlar yurak-qon tomir operatsiyalarida anesteziya jarayonida yuzaga keladigan dolzarb masalalarni va ularning samarali yechimlarini tizimli tarzda yoritadi. Zamonaviy monitoring, multimodal sedatsiya va individualizatsiyalangan protokollar bemor xavfini kamaytirish va postoperatsion natijalarni yaxshilashda asosiy omil hisoblanadi. Yurak-qon tomir operatsiyalarida anesteziya jarayoni bemorning xavfsizligi va postoperatsion natijalarga bevosita ta'sir ko'rsatadi. Tadqiqot va adabiyotlar tahlili shuni ko'rsatadiki, gemodinamik monitoring, antikoagulyatsiya nazorati, organ

himoyasi, sedatsiya strategiyalari va individualizatsiyalangan yondashuvlar bu jarayonda eng dolzarb masalalardan hisoblanadi. Zamonaviy invaziv va non-invaziv monitoring tizimlari bemorning gemodinamik statusini real vaqt rejimida kuzatishga imkon beradi, bu esa postoperatsion asoratlarni kamaytirishda muhim ahamiyatga ega. Shuningdek, individualizatsiyalangan antikoagulyatsiya va hemostaz monitoringi qon yo‘qotishni kamaytiradi, multimodal sedatsiya va BIS monitoringi postoperatsion delirium xavfini sezilarli darajada kamaytiradi. Organ-spesifik himoya strategiyalari — kardioplegiya, perfuziya va volemik monitoring — yurak, buyrak va miya funksiyalarini saqlashga yordam beradi. Shu bilan birga, bemorning individual profili va comorbidalari hisobga olingan anesteziya protokollari klinik natijalarni optimallashtirishga imkon yaratadi. Bugungi kunda sun’iy intellekt asosidagi monitoring tizimlari va real-time algoritmlar bemorning holatini prognozlash va murakkab vaziyatlarda tezkor qaror qabul qilish imkonini kengaytirmoqda. Bu esa anesteziya jarayonida dolzarb masalalarni yanada samarali hal qilishga yordam beradi. Adabiyotlarda keltirilgan natijalar shuni ko‘rsatadiki, yurak-qon tomir operatsiyalarida anesteziya jarayonida yuzaga keladigan muammolarni tizimli tarzda aniqlash va zamonaviy yechimlarni qo‘llash bemor xavfini kamaytiradi va postoperatsion rehabilitatsiya samaradorligini oshiradi. Shu sababli klinik amaliyotda individualizatsiyalangan, multimodal va innovatsion yondashuvlar asosiy strategiya sifatida tavsiya etiladi. Ushbu tahlil shuni ko‘rsatadiki, yurak-qon tomir operatsiyalarida anesteziya jarayonida yuzaga keladigan muammolar bir nechta sohalarni qamrab oladi: gemodinamik beqarorlik, antikoagulyatsiya va qon yo‘qotish, organ himoyasi, sedatsiya va postoperatsion delirium. Har bir muammo bemorning postoperatsion natijalari va ICU davomiyligiga bevosita ta’sir qiladi. Shu sababli, dolzarb masalalarni aniqlash va ularni zamonaviy, individualizatsiyalangan yondashuv bilan hal qilish muhim hisoblanadi.

Zamonaviy monitoring tizimlari, jumladan invaziv va non-invaziv usullar, bemorning gemodinamik statusini real vaqt rejimida kuzatish imkonini beradi va davolash strategiyasini optimallashtirishga yordam beradi. Shuningdek, multimodal sedatsiya, individual antikoagulyatsiya protokollari va organ-spesifik himoya strategiyalari postoperatsion asoratlarni kamaytiradi va bemorning tezroq rehabilitatsiyasini ta’minlaydi. Sun’iy intellekt va real-time algoritmlar esa murakkab holatlarda tezkor va aniq qaror qabul qilish imkonini kengaytiradi, bu esa anesteziya jarayonini yanada xavfsiz va samarali qiladi.

Tahlil shuni ko‘rsatadiki, yurak-qon tomir operatsiyalarida anesteziya jarayonini optimallashtirish bo‘yicha tavsiyalar quyidagilardan iborat: bemor xavfini individual baholash, zamonaviy monitoring tizimlarini qo‘llash, multimodal sedatsiya va

analgeziya strategiyalarini joriy etish, antikoagulyatsiya va qon yo‘qotishni nazorat qilish protokollarini shaxsiylashtirish va organ himoyasi protokollarini tizimli qo‘llash. Kelajakda bemor xavfini prognozlash va jarayonni yanada optimallashtirish uchun sun‘iy intellekt va predictive algorithms bilan integratsiyalangan monitoring tizimlari rivojlanishi muhim hisoblanadi. Shu bilan birga, klinik amaliyotda guideline va ilmiy dalillarga asoslangan individualizatsiyalangan protokollarni keng qo‘llash yurak-qon tomir operatsiyalari anesteziyasi xavfsizligini oshiradi va postoperatsion asoratlarni kamaytiradi.

Xulosa qilib aytganda, yurak-qon tomir operatsiyalarida anesteziya jarayonida yuzaga keladigan dolzarb masalalarni tizimli yondashuv bilan aniqlash va zamonaviy yechimlarni joriy etish bemor xavfini kamaytiradi, operatsiya natijalarini yaxshilaydi va klinik rehabilitatsiyani tezlashtiradi. Bu sohada olib borilgan tadqiqotlar va adabiyotlar asosida ishlab chiqilgan individualizatsiyalangan yondashuvlar, multimodal monitoring va organ himoyasi strategiyalari kelajakda anesteziya amaliyotini yanada rivojlantirishga xizmat qiladi.

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**IMPLANTOLOGY – A PROMISING DIRECTION IN MODERN
DENTISTRY
IMPLANTOLOGIYA – ZAMONAVIY STOMATOLOGIYANING
ISTIQBOLLI YO‘NALISHI
ИМПЛАНТОЛОГИЯ – ПЕРСПЕКТИВНОЕ НАПРАВЛЕНИЕ
СОВРЕМЕННОЙ СТОМАТОЛОГИИ**

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“Stamatalogiya” yo‘nalishi 1-bosqich talabasi

Annotatsiy: Mazkur maqolada implantologiya zamonaviy stomatologiyaning eng muhim va istiqbolli yo‘nalishlaridan biri sifatida ilmiy asosda keng tahlil qilinadi. Tadqiqotda tish implantatsiyasining shakllanish tarixi, rivojlanish bosqichlari, biologik va biomekanik asoslari, osteointegratsiya jarayonining mohiyati hamda klinik amaliyotdagi samaradorligi yoritilgan. Shuningdek, zamonaviy implant materiallari, ularning biofaolligi, raqamli stomatologiya texnologiyalarining (CBCT, CAD/CAM, 3D rejalashtirish) implantologiyadagi o‘rni ilmiy manbalar asosida tahlil qilinadi. Maqolada implantatsiyaning afzalliklari, xavf omillari va uzoq muddatli natijalari baholanib, implantologiyaning stomatologik reabilitatsiyadagi strategik ahamiyati asoslab beriladi.

Kalit so‘zlar: implantologiya, stomatologiya, tish implantlari, osteointegratsiya, biomateriallar, raqamli stomatologiya.

Annotation: This article provides a comprehensive scientific analysis of implantology as one of the most important and rapidly developing fields of modern dentistry. The study examines the historical development of dental implantation, its biological and biomechanical principles, and the essence of the osseointegration process. Special attention is paid to modern implant materials, their biocompatibility, and the role of digital technologies such as CBCT, CAD/CAM systems, and 3D planning in improving clinical outcomes. The effectiveness, advantages, potential risks, and long-term success rates of dental implants are evaluated based on current scientific literature. The findings highlight the strategic importance of implantology in oral rehabilitation and its future development prospects.

Keywords: implantology, dentistry, dental implants, osseointegration, biomaterials, digital dentistry.

Аннотация: В данной статье имплантология рассматривается как одно из наиболее перспективных и динамично развивающихся направлений современной стоматологии. В работе анализируются этапы становления дентальной имплантации, ее биологические и биомеханические основы, а также сущность процесса остеоинтеграции. Особое внимание уделяется современным имплантационным материалам, их биосовместимости и применению цифровых технологий (КЛКТ, САД/САМ, трехмерное планирование) в клинической практике. На основе научных источников оцениваются эффективность, преимущества и отдаленные результаты имплантационного лечения. Сделаны выводы о значимости имплантологии в комплексной стоматологической реабилитации пациентов.

Ключевые слова: имплантология, стоматология, дентальные импланты, остеоинтеграция, биоматериалы, цифровая стоматология.

Kirish: Zamonaviy tibbiyotda stomatologiya sohasi aholining hayot sifati va umumiy sog‘lig‘ini ta‘minlashda muhim o‘rin egallaydi. Ayniqsa, tish yo‘qotilishi bilan bog‘liq muammolar bemorlarning ovqatlanish funksiyasi, nutqi, estetik ko‘rinishi hamda psixologik holatiga salbiy ta‘sir ko‘rsatadi. Shu sababli yo‘qolgan tishlarni samarali va uzoq muddatli usullar bilan tiklash dolzarb ilmiy-amaliy masalalardan biri hisoblanadi. Implantologiya aynan ushbu muammoni hal etishga qaratilgan zamonaviy stomatologik yo‘nalish bo‘lib, u sun‘iy tish ildizlarini jag‘ suyak to‘qimasiga joylashtirish orqali funksional va estetik rehabilitatsiyani ta‘minlaydi. Ilmiy tadqiqotlar implantatsiya an‘anaviy protezlash usullariga nisbatan yuqori barqarorlik, qulaylik va uzoq muddatli samaradorlikka ega ekanligini ko‘rsatmoqda. Osteointegratsiya jarayonining chuqur o‘rganilishi implantlarning suyak bilan mustahkam birikishini ta‘minlab, klinik natijalarni sezilarli darajada yaxshiladi.

So‘nggi yillarda raqamli texnologiyalarning jadal rivojlanishi implantologiya amaliyotiga yangi imkoniyatlar olib kirdi. Kompyuter tomografiyasi, uch o‘lchamli modellashtirish va CAD/CAM tizimlari implant joylashtirish aniqligini oshirib, jarrohlik asoratlari xavfini kamaytirmoqda. Mazkur maqolaning maqsadi implantologiyaning ilmiy-nazariy asoslarini tahlil qilish, zamonaviy yondashuvlarni baholash hamda uning stomatologiya sohasidagi ahamiyatini asoslab berishdan iborat. Adabiyotlar tahlili va metodlar: Implantologiya masalalari bo‘yicha olib borilgan ilmiy tadqiqotlar tahlili shuni ko‘rsatadiki, mazkur yo‘nalish zamonaviy stomatologiyada mustahkam ilmiy asosga ega. XX asrning ikkinchi yarmida shved olimi P.I. Brånemark tomonidan osteointegratsiya hodisasining ilmiy jihatdan isbotlanishi implantologiyaning rivojlanishida burilish nuqtasi bo‘ldi. Ilmiy manbalarda titan va uning qotishmalari biologik mosligi, korroziyaga chidamliligi va mexanik

mustahkamligi tufayli implant materiallari orasida yetakchi o‘rin egallashi ta’kidlanadi. So‘nggi yillarda chop etilgan ilmiy maqolalar va monografiyalarda implant sirtining mikro va nano tuzilishini o‘zgartirish osteointegratsiya jarayonini tezlashtirishi hamda implantning uzoq muddatli barqarorligini oshirishi ilmiy asoslab berilgan. Shu bilan birga, bemorning umumiy somatik holati, suyak to‘qimasining zichligi va gigiyena ko‘rsatkichlari implantatsiya muvaffaqiyatiga bevosita ta’sir etuvchi omillar sifatida qayd etiladi.

Mazkur tadqiqotda ilmiy adabiyotlarni tahlil qilish, qiyosiy baholash, tizimli yondashuv hamda statistik ma’lumotlarni umumlashtirish metodlaridan foydalanildi. Ilmiy maqolalar, darsliklar va xalqaro elektron ma’lumotlar bazalarida e’lon qilingan materiallar asosiy manba sifatida tanlandi.

Natijalar: Olib borilgan adabiyotlar tahlili natijalari shuni ko‘rsatadiki, implantologiya tish yo‘qotilishi bilan bog‘liq muammolarni bartaraf etishda eng samarali va ishonchli usullardan biri hisoblanadi. Ilmiy tadqiqotlarda implantlarning uzoq muddatli muvaffaqiyat ko‘rsatkichi o‘rtacha 90–95 foizni tashkil etishi qayd etilgan. Ayniqsa, zamonaviy raqamli texnologiyalar asosida rejalashtirilgan implantatsiya jarayonlari klinik aniqlikni oshirib, asoratlar xavfini sezilarli darajada kamaytiradi. Tahlillar shuni ko‘rsatdiki, uch o‘lchamli kompyuter tomografiyasi va CAD/CAM texnologiyalaridan foydalanish implant joylashtirishning individual yondashuvini ta’minlaydi. Natijada, suyak to‘qimasi bilan implant o‘rtasidagi integratsiya jarayoni barqaror kechib, bemorning funksional va estetik qoniqishi ortadi. Ilmiy manbalarda implantatsiya natijasida bemorlarning chaynash funksiyasi tiklanishi, nutq sifatining yaxshilanishi va hayot sifati oshishi ilmiy dalillar bilan asoslab berilgan.

Muhokama: Olingan natijalar implantologiyaning zamonaviy stomatologiyadagi muhim o‘rnini yana bir bor tasdiqlaydi. Ilmiy adabiyotlar tahlili shuni ko‘rsatadiki, implantatsiya usuli an’anaviy protezlash bilan solishtirilganda funksional barqarorlik, estetik ko‘rinish va uzoq muddatli klinik samaradorlik jihatidan ustun hisoblanadi. Ayniqsa, osteointegratsiya jarayonining chuqur ilmiy o‘rganilishi implantlarning suyak to‘qimasi bilan mustahkam birikishini ta’minlab, davolash natijalarining barqarorligini oshiradi. Muhokama jarayonida aniqlanganki, implantatsiya muvaffaqiyati ko‘plab omillarga bog‘liq bo‘lib, ular orasida bemorning yoshi, umumiy somatik holati, suyak to‘qimasining sifati va miqdori, shuningdek, jarrohlik va ortopedik bosqichlarning to‘g‘ri rejalashtirilishi muhim ahamiyat kasb etadi. Zamonaviy ilmiy tadqiqotlarda raqamli texnologiyalardan foydalanish implant joylashtirishda individual yondashuvni ta’minlab, xatolik ehtimolini sezilarli darajada kamaytirishi qayd etilgan. Shu bilan birga, ayrim ilmiy manbalarda implantatsiya jarayonida asoratlar yuzaga kelish ehtimoli mavjudligi ta’kidlanadi. Bunday holatlar

ko'pincha gigiyena talablariga rioya qilinmasligi, noto'g'ri rejalashtirish yoki bemorning umumiy sog'lig'i bilan bog'liq omillar natijasida kelib chiqadi. Demak, implantologiyada yuqori natijalarga erishish uchun ilmiy asoslangan yondashuv, klinik tajriba va zamonaviy texnologiyalardan kompleks foydalanish zarur.

XULOSA: Xulosa qilib aytganda, implantologiya zamonaviy stomatologiyaning eng istiqbolli va ilmiy asoslangan yo'nalishlaridan biri hisoblanadi. Ilmiy tadqiqotlar va klinik kuzatuvlar tish implantatsiyasining yuqori samaradorligini, uzoq muddatli barqarorligini hamda bemorlarning hayot sifatini yaxshilashdagi muhim ahamiyat egalaydi. Maqola doirasida olib borilgan tahlillar implantologiyada osteointegratsiya jarayonining markaziy o'rin tutishini, implant materiallari va ularning sirt xususiyatlari davolash natijalariga bevosita ta'sir ko'rsatdi. Raqamli stomatologiya texnologiyalarining joriy etilishi esa implantatsiya jarayonining aniqligi va xavfsizligini oshirib, klinik asoratlarni xavfini kamaytirmoqda.

Kelgusida biomateriallar, nano-texnologiyalar va sun'iy intellektga asoslangan raqamli rejalashtirish tizimlarining rivojlanishi implantologiyaning yanada takomillashuviga xizmat qiladi. Shu bois, implantologiyani rivojlantirish va amaliyotga keng joriy etish zamonaviy stomatologiya oldida turgan ustuvor vazifalardan biri hisoblanadi.

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JIGAR VA O‘T YO‘LLARINING MIKROMORFOLOGIK VA TOPOGRAFIK ANATOMIYASI

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Annotatsiya: Ushbu maqola inson organizmidagi eng yirik parenximatoz a‘zo — jigarning (hepar) murakkab anatomik tuzilishini va zamonaviy gepatologiya yutuqlari asosida o‘rganadi. Tadqiqotda jigarning gomeostazni saqlashdagi morfologik asosi, uning qorin bo‘shlig‘idagi skeletotopiyasi va sintopiyasi, shuningdek, fiksatsiya apparati bo‘lgan boylamlarning batafsil tavsifi berilgan. Ayniqsa, jigarning ichki arxitekturasi — gepatotsitlar va sinusoidlar uyg‘unligi, darvoza venasining (v. portae) shakllanishi va uning jigar ichidagi tarmoqlanishi, o‘t yo‘llari tizimining (ductus hepaticus communis) shakllanish mexanizmlari ilmiy asoslangan. Maqola jigarning segmentar tuzilishini jarrohlik anatomiyasi nuqtai nazaridan tahlil qilib, jigar darvozasi (porta hepatis) tarkibidagi elementlarning o‘zaro joylashuv qonuniyatlarini keng qamrovli yoritadi.

Kalit so‘zlar: Jigar (hepar), vistseral yuza, diafragmal yuza, o‘roqsimon boylam, jigar darvozasi, Glisson kapsulasi, porta-kaval anastomozlar, Kuino segmentlari, o‘t pufagi, gepatotsit.

Kirish: Odam anatomiyasi fanida jigar o‘zining ko‘p qirrali vazifalari va murakkab vaskulyarizatsiyasi bilan barcha a‘zolar ichida ajralib turadi. Jigar — bu hayot uchun zarur bo‘lgan universal biokimyoviy "fabrika" bo‘lib, u hazm qilish tizimi, qon aylanishi va ekskretsiya funksiyalarini birlashtiradi. Anatomik nuqtai nazardan jigar o‘ng qovurg‘a osti sohasini to‘liq va epigastral sohaning bir qismini egallab, yuqoridan diafragma bilan, pastdan va orqadan esa qorin bo‘shlig‘ining muhim a‘zolari bilan bevosita aloqada bo‘ladi. Jigarning og‘irligi va shakli insonning konstitutsional tipiga ko‘ra turlicha bo‘lib, u nafaqat eng yirik bez, balki qonning asosiy deposi hisoblanadi (unda bir vaqtning o‘zida tana qonining 10-15 foizi bo‘lishi mumkin). Jigarning anatomik yaxlitligi va uning fiksatsiyasi nafaqat boylamlar, balki qorin ichki bosimi va jigar venalarining pastki kovak venaga (v. cava inferior) ulanishi orqali ta‘minlanadi. Jigarni o‘rganish uning embrional rivojlanishidan boshlab, yoshga oid

xususiyatlari va patologik jarayonlardagi morfologik o'zgarishlarigacha bo'lgan barcha bosqichlarni qamrab oladi.

Asosiy qism: Jigarning makroskopik anatomiyasi uning ikki yuzasini — qavariq diafragmal (facies diaphragmatica) va botiq vistseral (facies visceralis) yuzalarini o'z ichiga oladi. Bu yuzalar bir-biridan o'tkir pastki chekka (margo inferior) orqali ajraladi. Diafragmal yuzada jigarni o'ng va chap bo'laklarga ajratuvchi o'roqsimon boylam (lig. falciforme) joylashgan bo'lib, u orqada toj boylamga (lig. coronarium) o'tadi. Jigarning vistseral yuzasi eng murakkab anatomik landshaftga ega bo'lib, unda oshqozon (impressio gastrica), o'nikki barmoqli ichak (impressio duodenalis), o'ng buyrak (impressio renalis) va yo'g'on ichak (impressio colica) botiqlari aniq ko'rinadi. Ushbu yuzadagi "H" shaklidagi egatlar tizimi jigarni to'rt bo'lakka: o'ng (lobus dexter), chap (lobus sinister), kvadrat (lobus quadratus) va dumli (lobus caudatus) bo'laklarga ajratadi. Jigar darvozasi (porta hepatis) ko'ndalang egatda joylashgan bo'lib, bu yerda "D-V-A" qoidasi amal qiladi (ya'ni o't yo'li eng o'ngda, darvoza venasi o'rtada va jigar arteriyasi eng chapda joylashgan).

Jigarning ichki tuzilishi o'ziga xos mikrosirkulyator o'zan bilan ta'minlangan. Glisson kapsulasi (tunica fibrosa) jigar darvozasidan kirib, har bir jigar bo'lakchasini (lobulus hepatis) o'rab oladi. Jigar bo'lakchasi — bu a'zoning asosiy morfofunktsional birligi bo'lib, u olti burchakli prizma shakliga ega. Uning markazida v. centralis joylashgan bo'lib, unga sinusoid kapillarlar quyiladi. Sinusoidlar devorida fagotsitar xususiyatga ega bo'lgan Kupffer hujayralari mavjud bo'lib, ular qonni turli mikroblar va yot zarrachalardan tozalaydi. Qon ta'minotining o'ziga xosligi shundaki, jigar arteriyasi (a. hepatica propria) va darvoza venasi (v. portae) shoxlari jigar ichida bir-biriga parallel yurib, sinusoidlarda aralashadi. Bu esa jigarga bir vaqtning o'zida ham ozuqa moddalarni (venoz qon orqali), ham kislorodni (arterial qon orqali) yetkazib berish imkonini beradi.

Jigarning segmentar anatomiyasi (Kuino bo'yicha) zamonaviy jarrohlikda ustuvor ahamiyatga ega. Jigar 8 ta segmentdan iborat bo'lib, ularning har biri nisbatan avtonom qon ta'minoti va o't chiqish yo'liga ega. Segmentar bo'linish jigar darvozasidan chiqadigan tarmoqlanishning tartibli iyerarxiyasiga tayanadi. I-segment (dumli bo'lak) o'zining alohida qon aylanishi bilan ajralib turadi. Jigar o't yo'llari tizimi esa gepatotsitlar orasidagi o't kapillarlaridan boshlanib, segmentar va bo'laklararo o't yo'llari orqali o'ng va chap jigar yo'llarini (ductus hepaticus dexter et sinister) hosil qiladi. Ular birlashib, umumiy jigar yo'lini (ductus hepaticus communis) shakllantiradi. O't pufagi yo'li (ductus cysticus) bilan qo'shilgach, umumiy o't yo'li (ductus choledochus) vujudga keladi va u o'nikki barmoqli ichakning katta so'rg'ichiga (papilla duodeni major) quyiladi. Bu yo'llarning anatomik variatsiyalari

jarrohlik amaliyoti uchun o'ta muhim deb hisoblangan, chunki bu sohadagi anomaliyalar noto'g'ri operatsion taktikaga sabab bo'lishi mumkin.

Jigar fiksatsiyasida diafragmaning roli va pastki kovak venaning jigar to'qimasiga mahkam yopishganligi a'zoning pastga siljib ketmasligini ta'minlaydi. Shuningdek, jigarning "yalong'och maydoni" (area nuda) orqali u bevosita diafragmaga birikkan bo'lib, bu yerda qorin pardasi yo'q. jigarning limfa tizimiga ham katta e'tibor bergan bo'lib, uning yuzaki va chuqur limfa tomirlari jigar darvozasidagi limfa tugunlariga (nodi lymphatici hepatici) quyiladi. Jigarning nerv ta'minoti esa adashgan nerv (n. vagus) va simpatik chigallar (plexus hepaticus) orqali amalga oshirilib, bu gepatotsitlar sekretsiyasi va tomirlar tonusini boshqaradi.

Xulosa: jigarning anatomik tuzilishi uning organizmdagi markaziy o'rnini to'liq belgilab beradi. Makro-mikroskopik ma'lumotlar jigarning har bir bo'lafi, segmenti va sinusoidi ma'lum bir fiziologik muvozanatga xizmat qilishini isbotlaydi. Jigar — bu qon aylanish tizimi bilan hazm qilish tizimi kesishgan o'ta murakkab anatomik tugun bo'lib, uning segmentar va vaskulyar arxitekturasini bilish klinik tashxis qo'yish, ultratovush tahlili va jarrohlik amaliyotlarining muvaffaqiyatini ta'minlaydi. Anatomik bilimlarning chuqurligi gepatobiliar tizim kasalliklarini molekulyar darajadan to butun a'zo darajasigacha tushunish imkonini beradi.

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ORGANIZMNING GORMONAL MIKRO-ARXITEKTURASI: DIFFUZ ENDOKRIN TIZIM VA APUD-OTSITLAR GISTOFIZIOLOGIYASI.

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Annotatsiya: Ushbu maqolada organizmning diffuz endokrin tizimi (DET) va uning tarkibiy qismi bo'lgan APUD (Amine Precursor Uptake and Decarboxylation) tizimining tarkibi, lokalizatsiyasi va molekulyar-biologik ahamiyati kompleks tahlil qilinadi. Ushbu tizim hujayralarining hazm qilish, nafas olish va siydik-tanosil tizimi shilliq qavatlaridagi morfologik o'rni keng qamrovli yoritilgan. Tadqiqotda APUD-otsitlarning biogen aminlar va tartibga soluvchi peptidlarni sintez qilish mexanizmlari, shuningdek, ularning gistogematik to'siqlar bilan o'zaro aloqasi kitobiy ma'lumotlar asosida ko'rib chiqiladi. Maqola hujayralarning sekretor granular arxitektonikasi va ularning patofiziologik holatlardagi transformatsiyasi haqida chuqur tushuncha beradi. Bu esa neyroendokrinologiya va klinik morfologiya fanlari uchun nazariy asos bo'lib xizmat qiladi.

Kalit so'zlar: Diffuz endokrin tizim, APUD tizim, biogen aminlar, parakin sekretiya, neyroendokrinotsitlar, gastroenteropankreatik tizim

Kirish: Klassik endokrinologiyadan farqli o'laroq, organizmda gormon ishlab chiqaruvchi hujayralar nafaqat kompakt bezlarda, balki deyarli barcha a'zo va to'qimalarning epitelial qavatlarida tarqalgan bo'lib, ular yaxlit diffuz endokrin tizimni (DET) tashkil etadi. Ushbu tizim inson organizmidagi eng qadimiy va eng murakkab boshqaruv mexanizmlaridan biri bo'lib, nerv va endokrin regulyatsiya o'rtasidagi bog'lovchi bo'g'in hisoblanadi. Diffuz joylashgan bu hujayralar nafaqat masofaviy (distal) ta'sir ko'rsatadi, balki mahalliy (parakrin) darajada qo'shni hujayralar faoliyatini ham modulyatsiya qiladi. Bu hujayralarning mavjudligi organizmning har bir a'zosi o'ziga xos "ichki gormonal laboratoriya"ga ega ekanligidan dalolat beradi. Mazkur tizimning o'rganilishi biologik jarayonlarning naqadar nozik ekanligini, hatto bir dona hujayra ham butun a'zo fiziologiyasini o'zgartirishga qodirligini ko'rsatadi. Bugungi kunda DET hujayralarining onkogenezdagi o'rni va ularning gormonal muvozanatdagi hissasi zamonaviy gistologiya fanining eng dolzarb yo'nalishlaridan biri bo'lib qolmoqda.

Asosiy qism: APUD Tizimining Morfofunktsional Tahlili

Diffuz endokrin tizimning asosi bo'lgan APUD (Amine Precursor Uptake and Decarboxylation) konsepsiyasi hujayralarning biogen aminlarni (serotonin, gistamin, dopamin) o'zlashtirish va dekarboksillash xususiyatiga asoslanadi. Akademik To'tayevning fundamental gistologiya darsliklarida ko'rsatilishicha, bu tizim hujayralari embrional rivojlanishning erta bosqichlarida nerv qirralaridan (neuroectoderma) differensiallashib, butun tana bo'ylab migratsiya qiladi va turli a'zolarining epiteliy qatlamiga o'rnashadi. Ushbu hujayralar morfologik jihatdan pufakchasimon yoki piramidasimon shaklga ega bo'lib, ularning sekretor donachalari (granulalari) hujayraning bazal qismida — qon kapillyarlariga eng yaqin sohada to'planadi. Bunday qutblangan tuzilish (bazal sekretiya) ishlab chiqarilgan peptid va aminlarning tezkorlik bilan gistogematik to'siq orqali qon oqimiga o'tishini ta'minlaydi.

Gistologik jihatdan APUD-otsitlar o'z ichiga 40 dan ortiq hujayra turlarini oladi va ular asosan gastroenteropankreatik (GEP) tizimda konsentratsiyalangan. Masalan, oshqozon fundal bezlaridagi ECL-hujayralar gistamin ajratib, kislota sekretiyesini kuchaytirsa, o'nikki barmoqli ichakdagi S-hujayralar sekretin gormoni orqali oshqozon osti bezi shirasini boshqaradi. Ushbu tizim hujayralari kumush tuzlari yoki xrom tuzlari bilan bo'yalish xususiyatiga ega bo'lgani uchun ularni "argentaaffin" yoki "ar girofil" hujayralar deb ham ataladi. Ularning sitoplazmasidagi granular elektron mikroskop ostida turlicha zichlik va o'lchamda ko'rinadi, bu esa har bir hujayraning qaysi turdagi gormon (masalan, gastrin, xolesistokinin yoki motilin) sintez qilishidan dalolat beradi. Ta'limotning muhim qismi bu APUD tizimi hujayralarining "sensor" funksiyasidir. Ushbu hujayralar o'zlarining mikrovarsinkalari orqali a'zo bo'shlig'idagi kimyoviy o'zgarishlarni (masalan, pH darajasining o'zgarishi yoki glyukoza konsentratsiyasi) bevosita his qiladi va bunga gormonal javob qaytaradi. Masalan, ichak bo'shlig'idagi yog' kislotalari miqdori ortishi pilorik bo'limdagi I-hujayralarni qo'zg'atib, xolesistokinin ajralishiga sabab bo'ladi, bu esa safro pufagi qisqarishini anatomik-fiziologik jihatdan ta'minlaydi. Bundan tashqari, DET hujayralari neuropeptidlar sintezi orqali mahalliy immunitetni va to'qimalar regeneratsiyasini boshqaruvchi sitokinlar faolligini modulyatsiya qiladi. Bu esa APUD tizimini nafaqat endokrin, balki organizmning yaxlit integrativ tizimi sifatida namoyon etadi. Hujayralarning bunday polifunksionalligi ularning yuqori metabolik faolligi va ATFga boy mitoxondriyalar bilan ta'minlanganligi bilan izohlanadi.

Bundan tashqari, APUD tizimi hujayralari nafaqat hazm qilish traktida, balki nafas olish yo'llarida (Kultchitskiy hujayralari), buyrakda (yukstaglomerulyar hujayralar) va qalqonsimon bezda (parafollikulyar C-hujayralar) ham joylashgan. C-

hujayralar qalqonsimon bez follikulalari orasida yoki ularning devorida joylashib, kalsiy almashinuvini tartibga soluvchi kalsitonin ishlab chiqaradi. Nafas olish tizimidagi neyroendokrinotsitlar esa qon tomirlar tonusini va bronxlar o'tkazuvchanligini mahalliy darajada nazorat qiladi. To'tayev asarlarida qayd etilishicha, ushbu diffuz hujayralarning faoliyati neyronal nazorat ostida bo'lib, ular nerv impulslarini gormonal javobga aylantirib beruvchi "transdyuser" (o'tkazgich) vazifasini o'taydi. Bu esa organizmning adaptiv imkoniyatlarini kengaytirib, har qanday ichki va tashqi qo'zg'atuvchiga nisbatan tezkor molekulyar javob qaytarish imkonini yaratadi.

Xulosa: Diffuz endokrin tizim va APUD-otsitlar organizmning yaxlit hayot faoliyatini ta'minlovchi eng muhim mikromorfologik boshqaruv apparatidir. Professorlarning ilmiy qarashlari va zamonaviy gistologik ma'lumotlar shuni tasdiqlaydiki, ushbu tizim hujayralari a'zolarining o'zini-o'zi boshqarish tizimida (autoregulyatsiya) markaziy o'rin tutadi. Ularning anatomik tarqalishi va hujayraviy tuzilishi har bir a'zoning gormonal mustaqilligini ta'minlab, shu bilan birga umumiy endokrin tizim bilan uyg'unlikda ishlash imkonini beradi. APUD tizimining buzilishi nafaqat alohida a'zo kasalliklariga, balki tizimli metabolik buzilishlarga va neyroendokrin o'smalarning rivojlanishiga olib kelishi mumkin. Shunday qilib, ushbu tizimni chuqur o'rganish nazariy anatomiya va gistologiya fanlarini klinik amaliyot bilan bog'lovchi fundamental yo'nalish bo'lib qolmoqda.

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