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SPORT JAROHATLARIDA SHIFOKORGACHA BO'LGAN BIRINCHI YORDAMNI TASHKIL ETISHNING ZAMONAVIY USULLARI

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Jismoniy tarbiya va sport bo'yicha
mutaxassislarni qayta tayyorlash va
malakasini oshirish institute,kata o'qituvchisi

Annotatsiya

Mazkur maqolada sport jarohatlarida shifokorgacha bo'lgan birinchi yordamni tashkil etishning zamonaviy usullari tahlil qilinadi. Sport faoliyati jarayonida yuzaga keladigan turli jarohatlar sportchilarning sog'lig'i va faoliyatiga jiddiy ta'sir ko'rsatishi mumkin. Shu sababli jarohat yuzaga kelgan dastlabki daqiqalarda to'g'ri va tezkor yordam ko'rsatish muhim ahamiyatga ega. Maqolada sport jarohatlarining asosiy turlari, ularning kelib chiqish sabablari hamda ularga shifokorgacha ko'rsatiladigan birinchi yordamning zamonaviy usullari ilmiy jihatdan tahlil qilinadi. Tadqiqot davomida sport mashg'ulotlari va musobaqalar jarayonida tez-tez uchraydigan jarohatlar, jumladan mushak cho'zilishi, bo'g'im chiqishi, suyak sinishi va lat yeyish holatlari ko'rib chiqiladi. Shuningdek, birinchi yordam ko'rsatishda qo'llaniladigan zamonaviy texnologiyalar, tezkor tibbiy yordam tizimlari va sport tibbiyoti mutaxassislarning roli yoritiladi. Maqolada sport tashkilotlari, murabbiylar va tibbiyot xodimlari o'rtasidagi hamkorlikning ahamiyati ham alohida ta'kidlangan. Tadqiqot natijalari shuni ko'rsatadiki, sport jarohatlarida shifokorgacha bo'lgan yordamni to'g'ri tashkil etish sportchilarning sog'lig'ini saqlash va ularning tezroq tiklanishiga xizmat qiladi.

Kalit so'zlar: sport jarohati, birinchi yordam, sport tibbiyoti, favqulodda yordam, mushak cho'zilishi, suyak sinishi.

Annotation

This article analyzes modern methods of organizing pre-medical first aid for sports injuries. Sports activities often involve a high risk of injuries that may significantly affect athletes' health and performance. Therefore, providing immediate and appropriate first aid before professional medical assistance is crucial. The article examines common types of sports injuries, their causes, and modern approaches to providing pre-medical care. Special attention is given to injuries such as muscle strains, joint dislocations, fractures, and bruises that frequently occur during training sessions and competitions. The study also highlights the importance of modern technologies, emergency response systems, and the role of sports medicine specialists in ensuring

effective first aid. In addition, the cooperation between coaches, medical staff, and sports organizations is discussed as a key factor in improving the quality of emergency care in sports environments. The findings indicate that well-organized pre-medical assistance significantly contributes to the prevention of complications and accelerates athletes' recovery.

Keywords: sports injuries, first aid, sports medicine, emergency care, athlete safety, injury prevention.

Аннотация

В данной статье рассматриваются современные методы организации доврачебной первой помощи при спортивных травмах. Спортивная деятельность часто связана с высоким риском получения различных повреждений, которые могут негативно повлиять на здоровье спортсменов. В связи с этим особое значение имеет своевременное и правильное оказание первой помощи до прибытия медицинских специалистов. В статье анализируются основные виды спортивных травм, причины их возникновения и современные методы оказания доврачебной помощи. Особое внимание уделяется таким повреждениям, как растяжение мышц, вывихи суставов, переломы костей и ушибы. Также рассматривается роль тренеров, медицинских работников и современных технологий в организации эффективной системы оказания первой помощи спортсменам.

Ключевые слова: спортивные травмы, первая помощь, спортивная медицина, доврачебная помощь, безопасность спортсменов.

Kirish

Zamonaviy sport faoliyati yuqori jismoniy yuklama, tezkor harakatlar va kuchli raqobat bilan bog'liq bo'lib, bu jarayonda sportchilarning turli jarohatlar olishi ehtimoli yuqori hisoblanadi. Sport jarohatlari sportchilarning sog'lig'iga jiddiy zarar yetkazishi bilan birga, ularning sport faoliyatini vaqtincha yoki butunlay to'xtatib qo'yishi mumkin. Shu sababli sport jarayonida jarohatlarning oldini olish, shuningdek jarohat yuzaga kelgan holatda tezkor va to'g'ri yordam ko'rsatish muhim masalalardan biri hisoblanadi.

Sport jarohatlarida shifokorgacha bo'lgan birinchi yordam – bu jarohat sodir bo'lgan zahoti sportchining holatini yengillashtirish va asoratlarning oldini olish maqsadida amalga oshiriladigan tibbiy choralar majmuasidir. Bunday yordam ko'rsatish ko'pincha murabbiylar, sport tashkilotlari xodimlari yoki maxsus tayyorgarlikka ega shaxslar tomonidan amalga oshiriladi.

So'nggi yillarda sport tibbiyoti sohasida sezilarli rivojlanish kuzatilmoqda. Zamonaviy texnologiyalar va yangi metodlar sport jarohatlariga tezkor yordam ko'rsatish

imkoniyatlarini kengaytirdi. Masalan, portativ diagnostika vositalari, mobil tibbiy brigadalar va maxsus sport tibbiyoti markazlari sportchilar sogʻligʻini muhofaza qilishda muhim rol oʻynamoqda.

Mazkur maqolaning maqsadi sport jarohatlarida shifokorgacha boʻlgan birinchi yordamni tashkil etishning zamonaviy usullarini oʻrganish va ularning samaradorligini tahlil qilishdan iborat.

Asosiy qism

Sport jarohatlari sport mashgʻulotlari yoki musobaqalar jarayonida yuzaga keladigan jismoniy shikastlanishlarni anglatadi. Bunday jarohatlar sportchining organizmiga ortiqcha yuklama tushishi, texnik xatolar yoki xavfsizlik qoidalariga rioya qilinmasligi natijasida yuzaga kelishi mumkin.

Sport jarohatlarining eng keng tarqalgan turlaridan biri mushak choʻzilishidir. Bu holat koʻpincha keskin harakatlar yoki notoʻgʻri mashq bajarish natijasida yuzaga keladi. Mushak choʻzilishi sodir boʻlganda jarohatlangan joyga sovuq kompress qoʻyish, shikastlangan aʼzoni harakatsiz holatda ushlab turish va sportchiga dam berish tavsiya etiladi.

Boʻgʻim chiqishi ham sportchilar orasida tez-tez uchraydigan jarohatlardan biridir. Bu holatda boʻgʻimning normal anatomik holati buziladi. Bunday vaziyatda jarohatlangan boʻgʻimni harakatsiz holatga keltirish va imkon qadar tezroq tibbiy yordamga murojaat qilish zarur.

Suyak sinishi esa eng ogʻir sport jarohatlaridan biri hisoblanadi. Sinish holatida jarohatlangan aʼzoni maxsus shina yordamida qotirib qoʻyish va sportchini tibbiyot muassasasiga yetkazish muhim hisoblanadi.

Sport jarohatlarida birinchi yordam koʻrsatishda **RICE usuli** keng qoʻllaniladi. Ushbu usul dam olish, sovuq qoʻllash, bosim berish va jarohatlangan aʼzoni balandroq holatda ushlab turish kabi choralarni oʻz ichiga oladi.

Zamonaviy sport tibbiyotida jarohatlarga tezkor yordam koʻrsatish uchun maxsus tibbiy brigadalar tashkil etilmoqda. Shuningdek sport maydonlarida birinchi yordam vositalari bilan jihozlangan tibbiy punktlar faoliyat yuritmoqda.

Murabbiylar va sport tashkilotlari xodimlarini birinchi yordam koʻrsatish boʻyicha muntazam oʻqitish ham sport jarohatlarining salbiy oqibatlarini kamaytirishda muhim ahamiyatga ega.

Xulosa

Sport jarohatlarida shifokorgacha boʻlgan birinchi yordamni toʻgʻri tashkil etish sportchilarning sogʻligʻini saqlash va ularning tezroq tiklanishini taʼminlashda muhim ahamiyatga ega. Jarohat sodir boʻlgan dastlabki daqiqalarda toʻgʻri koʻrsatilgan

yordam og‘ir asoratlarning oldini oladi va sportchining hayotini saqlab qolishi mumkin.

Tadqiqot natijalari shuni ko‘rsatadiki, zamonaviy sport tibbiyoti texnologiyalari, murabbiylarning tibbiy bilimlari va sport tashkilotlarining samarali hamkorligi sport jarohatlariga tezkor yordam ko‘rsatish tizimini yanada takomillashtirishga xizmat qiladi.

Kelajakda sport tashkilotlarida birinchi yordam tizimini yanada rivojlantirish, murabbiylar va sportchilarni tibbiy bilimlar bilan ta‘minlash sport xavfsizligini oshirishda muhim omil bo‘lib xizmat qiladi.

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KUNGABOQAR MOYI TARKIBIDAGI BA'ZI OG'IR METALL IONLARINI ANIQLASH

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Annotatsiya. Ushbu tadqiqot kungaboqar moyida og'ir metall ionlari bilan ifloslanish darajasini o'rganishga qaratilgan. Tadqiqotda qo'llanilgan metodlar orqali metall ionlarning mavjudligi va konsentratsiyasi aniqlanib, ularning iste'mol xavfi baholangan va kungaboqar yog'i ishlab chiqarishda xavfsizlik va sifat nazorati bo'yicha tavsiyalar berilgan.

Tayanch so'zlar: Og'ir metallar, kungaboqar moyi, monitoring, zichlik, toksik ta'sir, aniqlik va ishonchlilik, ionlar miqdori

Ushbu tadqiqot O'zbekiston Respublikasi hududidagi kungaboqar yetishtiriladigan oltita mintaqadan olingan kungaboqar moyidagi ba'zi og'ir metallar tarkibini (nikel, kadmiy va qo'rg'oshin) aniqlashga qaratilgan. Tadqiqotda og'ir metall konsentratsiyasini aniqlash uchun ICP MS qurilmasi ishlatilgan va tadqiqot oxirida tekshirilgan na'munalardagi kadmiy va qo'rg'oshin miqdori mos ravishda 0-0,06 mkg kg-1, nikel 0,88 7,74 mkg kg-1 va 0-1,07 mkg kg-1 oralig'ida aniqlangan. Tadqiqotlar natijasi ushbu mintaqada yetishtirilgan kungaboqar urug'larida topilgan og'ir metall konsentratsiyasi inson salomatligiga ta'sir qiluvchi chegaraviy qiymatlardan past ekanligini ko'rsatdi.

Kungaboqar yog'i oziq-ovqat sanoatida keng qo'llaniladigan va ozuqaviy qiymati yuqori bo'lgan mahsulot hisoblanadi. U tarkibidagi foydali yog' kislotalari, vitaminlar va minerallar tufayli inson salomatligi uchun muhimdir. Shu bilan birga, atrof-muhitning ifloslanishi va sanoat faoliyati natijasida hosil bo'lgan og'ir metall ionlari, jumladan qo'rg'oshin (Pb), kadmiy (Cd) nikel (Ni) va boshqalar oziq-ovqat mahsulotlariga tushib, inson salomatligiga tahdid qilishi mumkin. Og'ir metallar inson tanasida yig'ilib, uzoq muddatli toksik ta'sir ko'rsatishi, buyrak, jigar va asab tizimiga zarar yetkazishi, shuningdek saraton kasalliklari rivojlanishiga sabab bo'lishi mumkinligi ko'plab tadqiqotlar bilan tasdiqlangan. Shu sababli, kungaboqar moyi kabi keng iste'mol qilinadigan mahsulotlarda og'ir metallar bilan ifloslanish darajasini aniqlash va monitoring qilish oziq-ovqat xavfsizligini ta'minlashda muhim ahamiyatga ega. Tadqiqotning asosiy maqsadi kungaboqar yog'ida og'ir ionlarining mavjudligini va ularning konsentratsiyasini aniqlash, shuningdek, ushbu metallar bilan ifloslanish darajasining xavfsizlik standartlariga mosligini baholashdan iborat. Ushbu maqsadga erishish uchun turli laboratoriya metodlari, jumladan atom absorptsion spektrometriya va boshqa kimyoviy tahlil usullari qo'llanilib, natijalar asosida sog'liq uchun potensial xavf baholandi. Og'ir metallarning ekotizimga

tarqalishining eng muhim sabablari konchilik, avtotransport vositalarining chiqindilaridan chiqadigan gazlar, sanoat sektorining o'sishi, kimyoviy o'g'itlar va pestitsidlardan haddan tashqari ko'p foydalanish kabi faoliyatlardir. Og'ir metallar nisbatan yuqori zichlikka ega metallardir va past tezlikda ham toksik ta'sir ko'rsatadi. Qo'rg'oshin (Pb), kadmiy (Cd), va nikel (Ni) kabi 60 dan ortiq og'ir metallar mavjud va eng zaharli og'ir metallarni Cd, Pb va Ni deb sanash mumkin. Bu og'ir metallar odamlarning psixologik tuzilishiga ta'sir qilishi va sog'liq muammolariga olib kelishi mumkin. Tuproqdagi og'ir metallarning elementar miqdori 1 dan 100 000 $\mu\text{g kg}^{-1}$ gacha o'zgaradi va og'ir metallarning haddan tashqari dozasi tuproq tuzilishining yomonlashishiga, mahsulot hosildorligi va sifatining pasayishiga va atrof-muhitning ifloslanishiga olib keladi. Kadmiy va qo'rg'oshin organizmlar uchun jiddiy sog'liq muammolarini keltirib chiqarsa-da, nikel kanserogen ta'sirga ega. Bu og'ir metallar o'simliklarda osongina topiladi.

O'simliklar tomonidan ozuqa moddalarini singdirish tanlab bo'lsa-da, og'ir metallar o'simliklar tomonidan atrof-muhitda so'riladi va oziq-ovqat zanjiriga qo'shiladi. Bu holat o'simliklar bilan oziqlanadigan organizmlarga toksik ta'sir ko'rsatishi sababli inson salomatligiga salbiy ta'sir ko'rsatadi. Kungaboqar o'simligi tarkibida moy miqdori 40-50% bo'lgan, ishlab chiqarish sanoatida muhim xom ashyo hisoblanadi. U o'simlik moylari orasida eng ozuqaviy jihatdan qimmatli moylar qatoriga kirganligi sababli (69% to'yinmagan yog' kislotalari va 11% to'yingan yog' kislotalari), u ovqat tayyorlashda, qovurishda va margarin ishlab chiqarishda keng qo'llaniladi. Yog' ishlab chiqarilgandan keyin hosil bo'lgan pulpa tarkibida yuqori protein miqdori tufayli hayvonlar uchun ozuqa sifatida ishlatiladi.

Shuningdek, u bo'yoq, plastmassa, sovun va kosmetika sanoatida xom ashyo sifatida ishlatiladi. Kungaboqar urug'i ozuqa moddalarining qimmatli manbai hisoblanadi, chunki u xolesterin miqdorini pasaytiradigan E vitamini va linoleik kislotaga boy. So'nggi yillarda aholining ko'payishi tufayli texnologik faoliyatning ko'payishi atrof-muhit va oziq-ovqatning ifloslanishiga olib keladi. Og'ir metallar inson salomatligiga tahdid soladigan oziq-ovqat ifloslanishining eng muhim sabablaridan biri ekanligi ko'rinib turibdi. Atmosferadagi og'ir metallar juda xavfli bo'lgani uchun, bu elementlar va ularning ta'siri kuzatilishi kerak. Kungaboqar kabi o'simlik turlari bu elementlarni o'z ildizlari va tanalarida saqlashi mumkin. Og'ir metallarga yuqori bardoshlilikka ega bo'lgan kungaboqar tuproqdan o'simlik ozuqalarining haddan tashqari adsorbsiyasi tufayli og'ir metallar to'plangan joylarda tuproqni tozalash uchun ishlatiladi. Tadqiqotlar shuni ko'rsatdiki, Cd, Pb va Ni ning past konsentratsiyasi kungaboqar o'simliklarining ildiz va novdalarining cho'zilishini rag'batlantiradi, yuqori konsentratsiyalar esa unib chiqishini, ildiz va novdalarning cho'zilishini rag'batlantiradi. Atrof-muhitda og'ir metallarning haddan tashqari to'planishi unib chiqishi, ildiz, tananing rivojlanishi, urug'lardagi ferment faolligi, oqsil sintezi, yog' hosildorligi va mahsulot hosildorligi kabi rivojlanish omillariga salbiy ta'sir ko'rsatadi. Tadqiqotlar shuni ko'rsatadiki, atrof-muhit ifloslanishi yuqori bo'lgan hududlarda o'sadigan yog'li kungaboqarning ildizlari, poyalari, barglari va urug'larida Pb va Ni miqdori yuqori bo'ladi. Og'ir metallar bilan oziq-ovqat mahsulotlarining

ifloslanishi masalasi so`nggi o`n yilliklarda global miqyosda keng tadqiq etilmoqda, chunki bu holat inson salomatligi va oziq-ovqat xavfsizligiga jiddiy tahdid soladi [1]. Turli olimlar kungaboqar va boshqa o`simlik yog`larida og`ir metallar mavjudligini aniqlash bo`yicha tadqiqotlar olib borgan bo`lib, ularda Pb, Cd va Ni ionlarining miqdori va ularning iste`mol xavfi baholangan [2]. Misol uchun, Turkiya va Avstriya hududlarida o`tkazilgan tadqiqotlar shuni ko`rsatdiki, kungaboqar yog`i ishlab chiqarish jarayonidatuproq va xom ashyolarning ifloslanishi natijasida og`ir metallar mahsulotga o`tishi mumkin va bu doimiy monitoringni talab qiladi [3]. Shu sababli, zamonaviy laboratoriya metodlari, jumladan atom absorptsion spektrometriya, gaz xromatografiyasi va ICP-MS kabi usullar orqali og`ir metallar kontsentratsiyasini aniqlashda yuqori aniqlik va ishonchlilikni ta`minlash yo`lga qo`yilgan. Shu bilan birga, mavjud adabiyotlar og`ir metallar bilan ifloslanishning turli hududlardagi farqlari, ularning konsentratsiyasiga ta`sir qiluvchi omillar va sog`liq uchun potentsial xavflarini tahlil qilib, oziq-ovqat mahsulotlarini sifat va xavfsizlik standartlariga mos holda ishlab chiqarish zarurligini ta`kidlaydi. Umumiy holda, adabiyotlar tahlili kungaboqar yog`i va boshqa o`simlik yog`larida Pb, Cd va Ni ifloslanish darajasini aniqlash, monitoring tizimlarini ishlab chiqish va xavfsiz ishlab chiqarish texnologiyalarini takomillashtirish bo`yicha asosiy ilmiy va amaliy asoslarni yaratadi. Ushbu tadqiqotda kungaboqar yog`idagi og`ir metall ionlari (Pb, Cd, Ni) kontsentratsiyasini aniqlash uchun eksperimental laboratoriya metodlari qo`llanildi. Tadqiqot xom ashyolari sifatida Samarqand viloyati hududlaridan olingan kungaboqar urug`lari ishlatildi. Moy ishlab chiqarish jarayonida ekstraksiya usuli orqali olinib, keyinchalik laboratoriya tahliliga tayyorlandi. Og`ir metal kontsentratsiyasini aniqlashda bir qancha zamonaviy tahlil usullari qo`llanilib, Pb, Cd va Ni ionlarining mavjudligi va ularning mg/kg birlikdagi kontsentratsiyasi aniqlandi. Har bir namunadan uch karra takrorlash orqali olingan ma`lumotlar statistik jihatdan qayta ishlanib, o`rtacha qiymatlar va standart og`ishlar hisoblandi. Shuningdek, xom ashyo va tayyor mahsulotdagi og`ir metall darajalari milliy va xalqaro oziq-ovqat xavfsizligi standartlari bilan solishtirildi, bu esa iste`molchilar uchun potentsial xavfni baholash imkonini berdi. Tadqiqot davomida laboratoriya xavfsizligi qoidalariga qat`iy rioya qilindi va barcha kimyoviy reagentlar tahlil uchun mos darajada tozalangan holda ishlatildi. Ushbu metodologiya kungaboqar yog`idagi og`ir metall ionlari darajasini aniqlash, hududlararo farqlarni tahlil qilish va oziq-ovqat xavfsizligini ta`minlash bo`yicha ilmiy asos yaratishga imkon berdi. Tadqiqotlar shuni ko`rsatdiki, Pb va Cd darajalari shahar va shahar atrofi hududlarida eng yuqori bo`lgan, Ni miqdori esa barcha hududlarda nisbatan past darajada saqlangan. Natijalar atrof-muhit va sanoat omillari og`ir metall bilan ifloslanishga ta`sir qilishi mumkinligini ko`rsatadi. Muntazam monitoring va sifat nazorati iste`molchilar xavfsizligini ta`minlash va milliy hamda xalqaro oziq-ovqat xavfsizligi standartlariga rioya qilishda muhim ahamiyatga ega. Bu izlanish kungaboqar yog`i ishlab chiqarish va sifat nazorati bo`yicha amaliy tavsiyalar ishlab chiqishga asos bo`lib, shuningdek, ekologik va sanoat omillarining ifloslanishga ta`sirini aniqlash orqali mahsulot sifatini yaxshilash imkonini beradi.

Bundan tashqari, natijalar shuni ko'rsatadiki, hududlararo farqlarni hisobga olish oziq-ovqat xavfsizligini ta'minlashda muhim ahamiyatga ega. Shu bilan birga, qishloq hududlaridagi past darajalar, tabiiy sharoitlar va sanoat faoliyatining cheklanganligi bilan izohlanadi. Bu esa hududiy monitoring va ishlab chiqarish standartlarini rivojlantirish uchun ma'lumot beradi. Tadqiqot shuningdek, kelajakda og'ir metall monitoringi va sifat nazorati tizimini samarali tashkil etish uchun ilmiy asos yaratadi. Izlanish davomida shuni ham aniqlash mumkinki, kungaboqar yog'idagi og'ir metall darajasi nafaqat iste'mol xavfi, balki ekologik va sanoat omillari bilan ham bevosita bog'liq bo'lib, ular mahsulot sifati va xavfsizligiga sezilarli ta'sir ko'rsatadi. Shu bois, tadqiqot natijalari asosida ishlab chiqaruvchilar uchun xom ashyo tanlash, ishlab chiqarish jarayonini optimallashtirish va mahsulotni hududiy farqlarga qarab sifat nazoratini kuchaytirish bo'yicha amaliy tavsiyalar ishlab chiqish muhimdir.

Kungaboqar moyi tarkibidagi og'ir metall ionlarini aniqlash bo'yicha tadqiqotlarning amaliy qismi Samarqand davlat universiteti biokimyo instituti noorganik kimyoga ixtisoslashgan ilmiy tadqiqot laboratoriyasi hamda Samarqand viloyati hududida joylashgan "TONY GRIN" MCHJ sifat nazorati bo'limi laboratoriyasida amalga oshirildi. Ushbu jarayonda og'ir metallarni aniqlash uchun har bir na'munadan 0,2 grammdan olindi. Yonish pechiga 9 ml HNO_3 (65%) va 1 ml H_2O_2 (30%,) qo'shildi. Yonish jarayoni Ethos Easy (Advanced Microwave Digestion System-Milestone) qurilmasida 200°C da amalga oshirildi va xona haroratida 30 daqiqa davomida sovutildi. Ekstraktlar $0,45\ \mu\text{m}$ PTFE filtrlari bilan filtrlandi va ICP-MS tahlillari (Inductively Coupled Plasma Mass Spectrometer) o'tkazilgunga qadar muntazam $+4^\circ\text{C}$ haroratli muhitida saqlandi. Tahlillar 50 ml polietilen naychalarda o'tkazildi. Har bir kungaboqar na'munasi uch nusxada tahlil qilindi. Ni, Cd va Pb ning standart eritmalari $1000\ \text{mg L}^{-1}$ asosiy eritmasini suyultirish orqali tayyorlandi. Nihoyat, urug' na'munalaridagi B, Al, Mn, Fe, Co, Ni, Cu, Zn, Cd va Pb konsentratsiyalari ICP-MS qurilmasi bilan o'lchandi. Ni, Cd va Pb miqdori mos ravishda $0-0,06\ \mu\text{g kg}^{-1}$, $0,04-0,13\ \mu\text{g kg}^{-1}$ va $0-1,07\ \mu\text{g kg}^{-1}$ oralig'ida ekanligi aniqlandi. Xulosa qilib aytganda, tadqiqot kungaboqar yog'ida og'ir metall ionlari (Pb, Cd, Ni) darajasini aniqlash va ularning hududlararo farqlarini baholash orqali oziq-ovqat xavfsizligini ta'minlashda muhim ahamiyatga ega ekanligini ko'rsatdi. Natijalar urban sanoat hududlarida Pb va Cd konsentratsiyasining nisbatan yuqori bo'lishi, sanoat va transport chiqindilari kabi antropogen omillar mahsulot ifloslanishiga sezilarli ta'sir ko'rsatishini tasdiqladi shuningdek, Ni darajasining barcha hududlarda xavfsizlik standartlarida qolishi ushbu metallning mahsulotga o'tish ehtimoli past ekanligini ko'rsatdi. Tadqiqot shuningdek, atomabsorptsion spektrometriya kabi laboratoriya metodlarining aniqligi va ishonchliligini tasdiqladi. Bu esa kelgusida muntazam monitoring va sifat nazorati tizimlarini yo'lga qo'yishga ilmiy asos yaratadi. Umuman olganda, tadqiqot natijalari

kungaboqar yog'i ishlab chiqarish va oziq-ovqat xavfsizligi bo'yicha amaliy tavsiyalarni shakllantirish, og'ir metall ifloslanishini kamaytirish va iste'molchilar uchun xavfsiz mahsulotlarni ta'minlashga xizmat qiladi [7]. O'zbekistonda o'simlik yog'i ishlab chiqarish va undan foydalanish bo'yicha kungaboqar yog'i urug'lari birinchi o'rinda turadi. Shuning uchun, kungaboqar urug'laridagi og'ir metall miqdorini aniqlash va baholash oziq-ovqat xavfsizligi va inson salomatligi nuqtai nazaridan foydali deb hisoblanishi mumkin. O'zbekistonda yetishtirilgan kungaboqar yog'idan olingan og'ir metall va mikroelementlar miqdorini aniqlash, yog' ishlab chiqarishning unumdorligi va sifatini kuzatish imkonini beradi. Bizning tadqiqotimizda kungaboqar urug'laridagi Cd, Ni, Pb miqdori oz miqdorda bo'lib, me'yoriy darajadan past. Biroq, kungaboqar tuproqdan ortiqcha miqdorda elementlarni tortib olganligi sababli, mintaqalarda og'ir metallarning ifloslanishi nuqtai nazaridan ko'proq tadqiqotlar o'tkazilishi kerakligini taqoza etadi.

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IMMUNOHISTOCHEMICAL CHARACTERISTICS OF ENDOMETRIAL TUMORS

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Abstract. Endometrial cancer in women over 50 years of age is more aggressive in terms of the histological type of tumor, the degree of its differentiation, and the stage of the disease, characterized by an unfavorable prognosis.

Keywords: morphology, endometrioid adenocarcinoma.

Relevance. Endometrial cancer (EC) is the sixth most common cancer in the world [1,3,5,7,9] and the third most common cancer in Uzbekistan [2] in the female population. Over the past 30 years, the incidence rate in Uzbekistan has increased by 132% [2,4,6,8] and is not expected to decline in the near future [1], reflecting the increasing prevalence of risk factors such as obesity and the continuing aging of the population [3,10,11,13]. According to United Nations projections, the proportion of people aged 65 and older in the global population will increase from 10% in 2022 to 16% in 2050 [1]. It is important to note that in most countries, including Uzbekistan, women constitute the majority of the elderly population [2, 12]. Given the emerging socio-demographic trend, an increase in the number of EC patients over 50 years of age is expected in the coming years. In 2020, the global incidence of newly diagnosed endometrial malignancies in the age group of 50 years and older was 25.6% (107,001 people). By 2040, this figure is expected to increase to 33.5%, representing approximately 204,000 people [3]. In Uzbekistan, in 2021, the same figure was 6,732 (26.4%) patients in the age group ≥ 50 years [15]. A review of the literature revealed that there are currently no uniform principles for the management of endometrial cancer patients over 50 years of age. This problem may be related to the underrepresentation of older patients, including those with endometrial cancer, in clinical trials on optimal treatment methods [12, 14]. Given that the 5-year survival rate for patients with localized forms of the pathological process reaches 74-92% [1, 14], it is expected that a significant number of elderly and senile patients treated for EC will be registered with oncology clinics. Therefore, proper monitoring and recommendations to reduce the risk of recurrence are essential. While a significant number of studies are currently underway to identify prognostic factors influencing the course and outcome of EC, these factors should be studied separately for older individuals, which was the reason for conducting this study.

Objective of the study. To determine the clinical and morphological features and prognosis of endometrial cancer in patients over 50 years of age.

Materials and methods. The study included 136 patients who were examined and treated from 2022 to 2025 in the gynecology department of an oncology hospital in the Kharezm region. Based on clinical, ultrasound, and other indications, the patients underwent surgical treatment (hysteroscopy with RDV) or hysterectomy) followed by morphological examination of the endometrial material. Inclusion criteria: 1. Patients who received primary surgical treatment in the gynecology oncology department; 2. Postmenopausal; 3. Histologically verified diagnosis of uterine cancer. Exclusion criteria: 1. Patients who received primary surgical treatment elsewhere; 2. Patients who received any special treatment before surgery; 3. History of cancer; 4. Histologically confirmed uterine sarcomas. Information on the incidence of DNA mismatch repair (MMR) defects and p53 protein status was available for 145 of the 259 cases included in the study: 97/48 patients in Group 1 and 128/131 patients in Group 2. All cases were divided into three subgroups based on molecular alterations: Group 1 – dMMR, n=88 (35.9%); Group 2 – p53abn, n=19 (7.8%); Group 3 – pMMR/p53wt, n=138 (56.3%). An initial analysis of the distribution of the main histological variants of EC depending on the spectrum of molecular alterations revealed that the pMMR/p53wt subgroup included 8 cases of serous carcinoma. Considering that 90% of serous endometrial tumors show abnormal (mutant type) p53 protein staining in IHC studies, which is a surrogate marker for the presence of a mutation in the TP53 gene [1,3], these cases were re-examined with subsequent IHC evaluation. In 5 of 8 cases, repeat immunohistochemistry revealed abnormal p53 protein staining, confirming the diagnosis of serous endometrial carcinoma. In 18 of 8 cases, wild-type p53 protein was detected, leading to a change in diagnosis to undifferentiated carcinoma G3 in 2 cases and endometrioid carcinoma G1 in 1 case. The obtained changes led to a minor adjustment of the previously published data [19] on the distribution of the main histological variants of EC in two age groups, which ultimately did not affect the conclusion that EC in patients ≥ 70 years old is characterized by a predominance of non-endometrioid neoplasms compared to patients in the 50-69 year old group, $p = 0.005$. In the dMMR and pMMR/p53wt subgroups, tumors were represented by the endometrioid histotype – 94.32% and 95.66%, respectively ($p = 0.645$) with a prevalence of low-grade carcinomas – 81.8% and 88.4%, respectively ($p = 0.166$), while in the p53abn subgroup, more than half of all cases – 68.5% – were non-endometrioid forms of the disease, with the main histological subtype being serous adenocarcinoma – 57.9%, which led to a predominance of high-grade malignant neoplasms – 84.2%, $p < 0.001$.

An assessment of myometrial invasion by molecular subgroup revealed no significant differences between them, despite the fact that invasion of $>1/2$ of the myometrium was observed in most cases in the p53abn subgroup ($p = 0.418$), in contrast to tumor invasion into the cervical stroma, which was statistically more frequently observed in the p53abn subgroup – 36.8% versus 13.6% in the dMMR subgroup ($p = 0.016$) and 10.9% in the pMMR/p53wt subgroup ($p = 0.002$). It should be noted that the studied subgroups were comparable in terms of both the extent of surgical treatment and the adjuvant therapy administered in the postoperative period, which obviously excludes the possibility of influencing long-term results. The majority of all endometrioid carcinoma cases in the 50-69 year-old group fell within the pMMR/p53wt subgroup—72.8%, while non-endometrioid neoplasms fell primarily within the DNA mismatch repair deficiency subgroup—66.7%. The primary surgical treatment for patients included in the statistical analysis was extended panhysterectomy, performed in 174/245 (71%) cases, and the leading adjuvant therapy option in the postoperative period was radiation therapy, performed in 92.5% of cases (147/159). The specified volumes of specialized treatment in the 50-69 year-old group were predominant in the pMMR/p53wt subgroup – 70% and 72.5%, respectively; in the over-70 year-old group, in the subgroup with DNA mismatch repair deficiency – 52.4% and 48.7%, respectively, $p < 0.001$. For the remaining surgical treatment options and adjuvant therapy, no significant differences were found based on age or molecular subgroup. In both age groups, carcinomas from the subgroups with DNA mismatch repair deficiency and those without a specific molecular profile were characterized by similar prognoses, with no significant differences between them. In the 50-69 year old group, the 5-year overall, adjusted, and relapse-free survival rates of patients in the dMMR subgroup were 100%, 100%, and 71.4%, respectively, versus 95.6%, 97.8%, and 84.4%, respectively, in the pMMR/p53wt subgroup ($p = 0.463$, $p = 0.603$, and $p = 0.275$, respectively). In the group ≥ 70 years, the 5-year overall, adjusted, and relapse-free survival rates of patients in the dMMR subgroup were 79.2%, 90.5%, and 55.6%, respectively, versus 65.5%, 73.1%, and 51.8%, respectively, in the pMMR/p53wt subgroup ($p = 0.273$, $p = 0.132$, and $p = 0.785$, respectively).

Conclusions. Endometrial cancer in patients over 50 years of age is characterized by worse long-term results: 5-year overall, adjusted, and relapse-free survival rates were 69.4%, 78.1%, and 51.9% versus 96.2%, 97.4%, and 80.2% in the 50-69 year old group ($p < 0.001$).

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THE ROLE OF METABOLIC SYNDROME IN AGGRAVATING CHRONIC PURULENT RHINOSINUSITIS: IMMUNOBIOCHEMICAL INSIGHTS

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Relevance: Metabolic syndrome (MS) is a growing health concern and has been shown to worsen inflammatory diseases, including chronic purulent rhinosinusitis (CPRS). Patients with both CPRS and MS face increased risks of complications, which can lead to a more severe clinical course. Understanding how MS contributes to immune system dysregulation in CPRS is essential for improving disease management.

Purpose of the Study: The purpose of this study is to evaluate the impact of metabolic syndrome on immunobiochemical markers in patients with chronic purulent rhinosinusitis and to compare the findings with those in patients without metabolic syndrome.

Materials and Methods: The study analyzed immunobiochemical markers in 93 patients with chronic purulent rhinosinusitis: 52 without metabolic syndrome, 41 with metabolic syndrome, and a control group of 20 healthy individuals. Levels of cytokines (IL-4, IL-6, IL-8), C-reactive protein (CRP), SOD, and oDNA were measured using ELISA.

Results: Patients with CPRS and metabolic syndrome showed significantly higher levels of IL-4, IL-6, and IL-8 in both blood serum and nasal washes compared to those without metabolic syndrome. In particular, IL-8 levels in nasal washes were 2.41 times higher in patients with MS. Additionally, SOD levels were notably lower in patients with MS, indicating reduced antioxidant capacity and a higher inflammatory burden.

Conclusions: The findings demonstrate that metabolic syndrome significantly exacerbates chronic purulent rhinosinusitis by amplifying inflammatory cytokine production and reducing the body's antioxidant defense. These results suggest that metabolic syndrome should be a key consideration in the diagnosis and treatment planning for CPRS patients, as it may necessitate more aggressive or targeted interventions.

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YATROGENES IN NEONATOLOGY

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Relevance: The problem of iatrogenesis has become relevant not only in adult practice, where self-treatment takes place, but also in neonatology and pediatrics. Children developed diseases and pathological conditions due to unjustified prescription of pharmaceutical drugs. They are the result of side effects of medications, their components, impurities, and undesirable combinations of medications. In the absolute majority of cases, they require additional medication correction, and in a number of cases, can lead to serious health disorders and a decrease in the quality of life. Providing medical assistance is a complex form of professional activity. It requires deep special knowledge, practical skills, and high spiritual qualities. However, a medical worker may be mistaken because they are dealing with the most complex object of nature - the human body, especially the child's body.

Objective: 1. The professional level of the physician and staff; manual properties (innate or trained), ensuring the atraumatic nature of manipulations and surgical interventions; intelligence, general culture, and well-being.

2. Character, temperament.

3. Conditions for the work of personnel and the stay of children in the medical institution. Equipping with the necessary equipment and machinery. Rational organization of labor. Their decrease, deterioration, or absence results in iatrogenesis.

The first large-scale studies on the causes and characteristics of iatrogenias were conducted in the USA, Canada, and Australia. It turned out that iatrogenias occur in 2.9-3.7% of patients. In 70% of cases, a temporary deterioration in the patient's health lasting no more than 6 months occurs, in 2.6-16.6% severe iatrogenic pathological conditions arise, and in 3.6-6.6% - a fatal outcome. 20% of those admitted to US university hospitals for treatment suffered iatrogenic injuries, with 20% of these injuries being severe or fatal. According to WHO data, iatrogenias occur in 20% of patients and constitute 10% of hospital mortality*. It is worth noting that a high frequency of iatrogenias is observed during the periods of introduction and development of new treatment methods.

Conclusions: The conducted analysis of existing literature showed that the emergence of iatrogenias is an important medical, social, economic, and ethical problem of healthcare. The introduction of new diagnostic and treatment methods in neonatology

has increased the effectiveness of medical care for newborns and, at the same time, led to an increase in iatrogenic pathology.

The mention of medical personnel's inaction requires special attention (A.V. Smolyannikov called it iatrogeny with a negative sign). Inaction can be related not only to the lack of knowledge or experience of the doctor, but sometimes also to the lack of necessary resources or conditions in the arsenal. When the pathologist analyzes sectional data that, at first glance, do not give grounds for supposing iatrogenesis, the treating physician can easily recall a number of iatrogenic episodes that can play a role in the thanatogenesis.

The fulfillment of their heavy duty by doctors is possible only with the restoration of the high prestige of our profession, its material support, which is already being implemented and gives grounds for optimism regarding the prospects for reducing iatrogenesis and improving care for children. Preventive examinations, vaccinations, and vaccinations create a situation where iatrogenesis spreads not only to patients but also to all healthy children without exception. In this case, complications can cause acute reactions, in which practically no one is to blame. They are the inevitable reverse side of medical impact.

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DETERMINATION AND ANALYSIS OF SERUM PROTEINS BY THE GEL DIFFUSION METHOD

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Relevance. The identification of biological materials, especially blood traces, and the determination of their species origin are crucial aspects of forensic medical examination and laboratory diagnostics. In contemporary practice, the use of reliable, accurate, and relatively simple methods is essential. The gel diffusion method, particularly the radial immunodiffusion reaction, is based on antigen-antibody interaction and demonstrates high specificity in detecting blood proteins.

Research Objective. To study the capabilities of the gel diffusion method for detecting proteins in blood serum and to evaluate its diagnostic significance in forensic practice.

Materials and Methods. The study involved experiments using extracts obtained from bloodstains. The extracts were prepared in a physiological saline solution (sodium chloride) and purified by centrifugation. Concurrently, antibody-gel matrices were prepared using immune sera specific to human, avian, and bovine blood proteins.

Agar-agar was dissolved in a veronal-acetate buffer solution, cooled to 48°C, mixed with precipitating sera, and poured onto glass slides. Special wells were created in the resulting gel matrix, into which the test extracts, control solutions, and homologous antigens were introduced. The reaction was conducted in a humid chamber at room temperature.

Results. According to the research findings, clearly visible precipitation rings formed within 12 hours around the wells containing homologous antigens. In the antibody-gel matrix against human blood, precipitation rings were observed only in extracts belonging to human blood. Similarly, in matrices prepared against avian and bovine proteins, the reaction occurred only with proteins of the respective species.

No precipitation rings were observed in the control samples (extracts from the carrier object and the physiological saline solution). This confirms the high degree of specificity and reliability of the method. The precipitation rings were visualized more clearly through staining, which enhanced the ease of analysis.

Discussion. The results obtained demonstrate that the gel diffusion method, based on the antigen-antibody reaction, allows for the determination of the species origin of blood with high accuracy. The advantages of the method include its simplicity, the fact

that it does not require complex specialized equipment, and its visual results. Consequently, the method can be effectively applied in forensic examinations for analyzing biological evidence.

Conclusion. The gel diffusion method, specifically the radial immunodiffusion reaction, is a reliable, specific, and practically convenient method for detecting blood serum proteins and determining their species origin. This method is recommended for widespread use in forensic practice for the identification of blood traces.

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GENERAL CONCEPT OF CHRONIC TONZILLITIS.

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The relevance of the topic: Chronic tonsillitis, which is common in the field of otorhinolaryngology, is one of the most common diseases of the upper respiratory tract. Regarding the cause of the disease, according to various epidemiological data, this disease occurs in approximately 5-15% of the population, and in children up to 20-30%. This condition is one of the urgent problems encountered in medical practice. In scientific research conducted by foreign scientists Boris S. Preobrazhensky and Valentin T. Palchun, chronic tonsillitis was described as a prolonged infectious and allergic inflammation of the tonsils. The authors found that morphological changes in lymphoid tissue, the accumulation of microbial colonies in crypts, and immunological reactions are important in this disease.

Purpose of the work: the frequency of chronic tonsillitis in patients who applied to the Khorezm Regional Multidisciplinary Medical Center was studied.

The obtained results: during the study, 100 patients with chronic tonsillitis who applied to the Khorezm Regional Multidisciplinary Medical Center this year were studied. Out of 100 patients, 40 had an infectious form of chronic tonsillitis, and 60 had rheumatism as a complication of the infectious focus.

Conclusions: in conclusion, it can be said that chronic tonsillitis is an important otorhinolaryngological pathology that serves as a source of chronic infection in the human body. Early detection of the origin of the disease, the use of pathogenetically based treatment methods, and the improvement of preventive measures are of great importance in reducing the complications of the disease.

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TAJRIBAVIY METABOLIK SINDROM TA'SIRIDA MIOKARDNING MORFOLOGIK O'ZGARISHLARI

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Annotatsiya

Mazkur tezisda tajribaviy metabolik sindrom sharoitida ona organizmidagi metabolik buzilishlarning avlod yuragi morfologik rivojlanishiga ta'siri yoritilgan. Tadqiqot oq laborator kalamushlarida olib borilib, nazorat va metabolik sindrom modeli chaqirilgan guruhlar taqqoslangan. Homiladorlik davrida ona organizmida kuzatilgan giperglikemiya, dislipidemiya va tana vaznining ortishi fonida tug'ilgan avlod yuragida gistologik va morfometrik o'zgarishlar aniqlangan. Tadqiqot natijalari metabolik sindromning homila yurak-qon tomir tizimi shakllanishiga salbiy ta'sir ko'rsatishini hamda miokardda distrofik, gemodinamik va stromal o'zgarishlarni yuzaga keltirishini ko'rsatdi.

Kalit so'zlar: metabolik sindrom, miokard, yurak morfologiyasi, fetal rivojlanish, dislipidemiya, giperglikemiya, kardiomiotsit, gistologiya.

Kirish

So'nggi yillarda metabolik sindrom reproduktiv yoshdagi ayollar orasida keng tarqalib borayotgan klinik va ijtimoiy ahamiyatga ega patologik holatlardan biriga aylandi. Ushbu sindrom semizlik, uglevod va lipid almashinuvining buzilishi, arterial gipertenziya hamda insulinrezistentlik kabi komponentlarning birikmasi bilan xarakterlanadi. Metabolik sindromning xavfi shundaki, u nafaqat ona organizmiga, balki homila rivojlanishiga ham salbiy ta'sir ko'rsatadi.

Homila rivojlanishi davrida ona organizmida yuz beradigan metabolik siljishlar yurak-qon tomir tizimining shakllanishiga sezilarli ta'sir qilishi mumkin. Xususan, intrauterin davrda yuzaga kelgan metabolik noqulayliklar avlod organizmida yurakning struktur-funksional yetilishiga salbiy ta'sir ko'rsatib, keyinchalik kardiometabolik kasalliklarga moyillikni oshiradi. Shu nuqtayi nazardan, ona organizmida metabolik sindrom mavjud bo'lgan sharoitda avlod miokardining morfologik holatini o'rganish dolzarb ilmiy masalalardan biri hisoblanadi.

Tadqiqot maqsadi

Tajribaviy metabolik sindrom chaqirilgan ona kalamushlardan tugʻilgan avlodlarda miokardning gistologik va morfometrik xususiyatlarini oʻrganish hamda metabolik buzilishlarning yurak toʻqimasiga koʻrsatadigan taʼsirini baholash.

Tadqiqot materiali va usullari

Tadqiqot 2022–2025-yillar davomida laboratoriya sharoitida oq laborator kalamushlarda oʻtkazildi. Tajribada jinsiy yetilgan ona kalamushlar ikki guruhga ajratildi: nazorat guruhi va metabolik sindrom modeli chaqirilgan tajriba guruhi. Tajriba guruhidagi hayvonlarga yogʻ va fruktozaga boy ratsion berilib, ularda metabolik sindrom holati shakllantirildi. Homiladorlik davrida va tugʻruqdan keyingi laktatsiya bosqichida ona hayvonlar va ulardan tugʻilgan bolalarda metabolik koʻrsatkichlar baholandi.

Qonda glyukoza, umumiy xolesterin, triglitseridlar, LDL va HDL miqdori aniqlanib, metabolik holat monitoring qilindi. Gistologik tekshiruv uchun qorinchalar miokardi va qorinchalararo toʻsiqdan material olindi. Toʻqimalar formalinda fiksatsiya qilinib, parafin bloklar tayyorlandi va gematoksilin-eozin usulida boʻyaladi. Shuningdek, yurak toʻqimasining morfometrik koʻrsatkichlari maxsus dasturiy vositalar yordamida oʻrganildi.

Natijalar va muhokama

Tadqiqot natijalari tajriba guruhidagi ona kalamushlarda metabolik sindromning asosiy belgilari, yaʼni tana vaznining ortishi, giperglikemiya va aterogen dislipidemiya shakllanganini koʻrsatdi. Ayniqsa homiladorlikning kechki bosqichlarida glyukoza va lipid koʻrsatkichlarining sezilarli oshishi qayd etildi. Bu esa ona organizmida shakllangan metabolik buzilishlarning homila rivojlanishiga tizimli taʼsir koʻrsatganini koʻrsatadi.

Nazorat guruhidagi avlod yuragida miokard tuzilmasi fiziologik meʼyor doirasida boʻlib, endokard, miokard va epikard qatlamlari yaxshi differensiallashgan holda kuzatildi. Kardiomiotsitlar tartibli joylashgan, miofibrillalar tuzilishi aniq, biriktiruvchi toʻqima elementlari esa meʼyoriy holatda boʻldi.

Biroq metabolik sindrom fonida tugʻilgan avlodlarda yurak toʻqimasida bosqichma-bosqich morfologik oʻzgarishlar rivojlandi. Hayotning dastlabki kunlarida sezilarli tafovutlar kuzatilmagan boʻlsa-da, keyingi davrlarda miokard stromasida va qon tomirlarida patologik belgilar yaqqol namoyon boʻla boshladi. Yettinchi kundan boshlab mayda tomirlarda qon bilan toʻlish, venoz staz, diapedez xarakteridagi mayda qon quyilishlari hamda perivaskulyar shish qayd etildi. Bu holatlar

mikrosirkulyatsiyaning buzilishi va tomir devori o'tkazuvchanligining oshganidan dalolat beradi.

Ikkinchi haftaga kelib, biriktiruvchi to'qima tolalarida dezorganizatsiya, kollagen tolalarning shishi, endoteliy hujayralarining bo'rtishi va kardiomiotsitlarda vakuolizatsiya rivojlanganligi aniqlandi. Bu esa miokard to'qimasida distrofik va degenerativ jarayonlarning boshlanishini ko'rsatadi. Ayrim sohalarda limfogiotsitar infiltratsiya mavjudligi esa ikkilamchi reaktiv o'zgarishlarning shakllanayotganini anglatadi.

Hayotning uchinchi va to'rtinchi haftalarida patologik o'zgarishlar yanada chuqurlashdi. Miokard stromasida interstitsial shish keng tarqaldi, kardiomiotsitlarda oqsilli-gidropik distrofiya, miofibrillalarning parchalanishi va sitoplazmatik bo'shashish kuzatildi. Ayrim arterial tomirlarda devor qalinlashuvi, lümen torayishi va subendotelial qatlamda ko'piksimon hujayralarning paydo bo'lishi qayd etildi. Bu holat metabolik sindrom sharoitida yurak tomirlarida aterogen yo'nalishdagi erta morfologik o'zgarishlar yuzaga kelayotganini ko'rsatadi.

Morfometrik tekshiruvlar ham tajriba guruhidagi bolalarda arterial tomir diametrining nazorat guruhiga nisbatan past bo'lganini tasdiqladi. Tomir lümenining torayishi va devor qalinlashuvi yurak to'qimasining qon bilan ta'minlanishini cheklab, miokardda trofik buzilishlarning chuqurlashishiga zamin yaratadi. Ushbu natijalar metabolik sindromning homila yuragiga nafaqat metabolik, balki struktur va gemodinamik jihatdan ham zararli ta'sir ko'rsatishini ilmiy jihatdan asoslaydi.

Mazkur kuzatuvlar ona organizmidagi metabolik noqulay muhit avlod yuragi rivojlanishiga "fetal dasturlanish" mexanizmi orqali ta'sir etishini ko'rsatadi. Bunday sharoitda shakllangan morfologik siljishlar keyingi hayot bosqichlarida yurak-qon tomir patologiyalarining rivojlanishi uchun anatomo-funksional zamin bo'lib xizmat qilishi mumkin.

Xulosa

Tajribaviy metabolik sindrom ona organizmida shakllanganda, u avlod yuragining morfologik rivojlanishiga salbiy ta'sir ko'rsatadi. Metabolik sindrom fonida tug'ilgan bolalarda miokardda interstitsial shish, kardiomiotsitlarning oqsilli distrofiyasi, miofibrillalarning struktur buzilishi, qon tomir devorlarining qalinlashuvi va mikrosirkulyator o'zgarishlar rivojlanishi kuzatiladi. Ushbu natijalar ona metabolik holatini nazorat qilish va homiladorlikka qadar metabolik sindromni erta aniqlashning naqadar muhim ekanini ko'rsatadi. Reproduktiv yoshdagi ayollarda metabolik sindrom profilaktikasi va korreksiyasi kelajak avlod yurak salomatligini saqlashda muhim ahamiyatga ega.

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- 6.

EPIDEMIOLOGICAL CHARACTERISTICS OF CERVICAL INTRAEPITHELIAL NEOPLASIA ASSOCIATED WITH HUMAN PAPILLOMAVIRUS

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Relevance:

Cervical intraepithelial neoplasia (CIN) is a common precancerous condition among women and represents a key precursor stage of cervical cancer. Modern epidemiological studies demonstrate that human papillomavirus (HPV), particularly high-risk types 16 and 18, plays a leading role in the development of CIN. According to available data, HPV is detected in 90–99% of CIN II–III cases (Schiffman et al., 1993). The widespread prevalence of HPV infection and its significant socio-economic burden determine the high relevance of this problem.

Objective:

To analyze the epidemiological characteristics of HPV-associated cervical intraepithelial neoplasia, including its prevalence, age distribution, and major risk factors.

Materials and Methods:

This thesis is based on the analysis of international and regional epidemiological studies, systematic reviews, and meta-analyses. Data on HPV prevalence, CIN grades (CIN I, II, III), age distribution, and key risk factors were comparatively evaluated. Information on population-based screening programs and vaccine effectiveness was also included (Zhao et al., 2012; Kalliala et al., 2020).

Results:

The analysis showed that HPV infection is highly prevalent among sexually active women, with the highest rates observed in the 20–30 age group. However, most infections are transient and are cleared within 1–2 years. Only persistent HPV infection leads to the development of CIN (Stanley, 2010).

CIN I is more frequently detected in younger women and often undergoes spontaneous regression, whereas CIN II–III is more common in women over 30 years of age and is associated with a higher risk of malignant transformation.

Epidemiological data indicate regional differences in CIN prevalence, with higher

rates observed in developing countries, largely due to insufficient screening programs (Franco et al., 2003).

Major risk factors include early onset of sexual activity, multiple sexual partners, immunosuppression, HIV infection, co-existing sexually transmitted infections, and socio-demographic factors (Holly, 1996). In addition, persistent infection with high-risk HPV types is the most important determinant of CIN development.

In recent years, the introduction of HPV vaccination has led to a reduction in the incidence of high-grade CIN. Population-based studies show that increased vaccine coverage is associated with a significant decrease in CIN II–III cases (Benard et al., 2017).

Conclusion:

HPV infection is the primary etiological factor of cervical intraepithelial neoplasia, and its epidemiology is closely related to infection prevalence, persistence, and associated risk factors. Screening programs and preventive vaccination play a crucial role in reducing the burden of this disease.

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9.

ПОЛИРЕЗИСТЕНТНОСТЬ К АНТИБИОТИКАМ: БАКТЕРИОФАГИ И ПЕПТИДНЫЕ АНТИБАКТЕРИАЛЬНЫЕ СРЕДСТВА НОВОГО ПОКОЛЕНИЯ

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Аннотация: Полирезистентность к антибиотикам является одной из наиболее серьёзных проблем современной медицины, связанной с широким и неконтролируемым применением антибактериальных препаратов. В ответ на рост устойчивости бактерий исследователи активно изучают альтернативные подходы к лечению инфекций. Среди перспективных методов выделяются бактериофаги — вирусы, специфически нацеленные на бактерии, способные разрушать штаммы с множественной устойчивостью, а также пептидные антибактериальные средства нового поколения, обладающие широким спектром действия и низким риском формирования резистентности. Современные исследования демонстрируют, что комбинированное использование этих стратегий позволяет существенно снизить бактериальную нагрузку и ограничить распространение полирезистентных штаммов. Эти инновационные подходы открывают новые перспективы для разработки безопасных и эффективных методов лечения инфекций, устойчивых к традиционным антибиотикам.

Ключевые слова: Полирезистентность к антибиотикам, бактериофаги, пептидные антибактериальные средства, бактериальная устойчивость, альтернативная антибактериальная терапия, инфекционные заболевания, новые методы лечения, многорезистентные штаммы.

Введение: С ростом числа случаев полирезистентных бактериальных инфекций во всём мире проблема устойчивости к антибиотикам становится одной из наиболее актуальных в современной медицине. Неправильное и чрезмерное использование традиционных антибактериальных препаратов приводит к появлению штаммов бактерий, устойчивых к нескольким классам лекарств, что осложняет лечение инфекций и повышает риск летальных исходов. В этой связи поиск альтернативных и инновационных методов терапии приобретает особую значимость. Среди таких методов особое внимание уделяется бактериофагам — вирусам, специфически нацеленным на бактерии, способным разрушать

устойчивые штаммы, а также пептидным антибактериальным средствам нового поколения, обладающим широким спектром действия и низкой склонностью к развитию резистентности. Разработка и внедрение этих подходов открывают перспективы для создания более эффективных и безопасных методов лечения инфекционных заболеваний, устойчивых к традиционным антибиотикам.

Основная часть: Полирезистентность к антибиотикам (ПРА) представляет собой глобальную угрозу для здравоохранения. Всемирная организация здравоохранения (ВОЗ) отмечает, что ежегодно более 700 000 человек во всём мире умирают от инфекций, вызванных бактериями с множественной устойчивостью, и эта цифра может увеличиться до 10 миллионов к 2050 году, если не будут внедрены новые терапевтические стратегии. Традиционные антибиотики теряют эффективность из-за мутаций бактерий и горизонтального переноса генов резистентности, что делает лечение тяжелых инфекций крайне сложным.

Одним из перспективных методов борьбы с полирезистентными бактериями являются бактериофаги. Бактериофаги — это вирусы, специфически нацеленные на бактерии, способные разрушать бактериальные клетки без повреждения клеток организма-хозяина. Экспериментальные и клинические исследования показывают, что применение бактериофагов может сокращать бактериальную нагрузку на 70–90%, особенно при инфекциях, вызванных *Staphylococcus aureus*, *Pseudomonas aeruginosa* и *Klebsiella pneumoniae*. В некоторых случаях терапия бактериофагами позволяла снизить использование антибиотиков на 30–50%, что уменьшало вероятность дальнейшего развития резистентности.

Другой инновационной стратегией являются пептидные антибактериальные средства нового поколения. Они представляют собой короткие цепи аминокислот, обладающие широким спектром действия против грамположительных и грамотрицательных бактерий, а также грибковых патогенов. Пептидные препараты действуют преимущественно на мембрану бактериальной клетки, вызывая её разрушение, что делает невозможным для бактерий быстрое формирование устойчивости. Согласно данным исследований, эффективность некоторых пептидных антибактериальных средств достигает 80–95% в отношении штаммов с множественной резистентностью.

Современные подходы включают комбинированное использование бактериофагов и пептидных препаратов. Эксперименты на лабораторных моделях показали, что их совместное применение обеспечивает синергетический эффект: снижается бактериальная нагрузка, уменьшается образование биоплёнок и ускоряется восстановление тканей после инфекционного процесса.

Кроме того, такие комбинации позволяют сокращать дозы антибиотиков, снижая токсическое воздействие на организм и вероятность побочных эффектов.

Несмотря на высокий потенциал этих методов, остаются нерешённые вопросы. Среди них — иммунологическая совместимость бактериофагов, оптимальные схемы введения пептидных препаратов, их стабильность в организме, а также долгосрочная безопасность применения. Необходимы крупномасштабные клинические испытания для подтверждения эффективности и безопасности этих инновационных стратегий в реальной практике. В целом, бактериофаги и пептидные антибактериальные средства нового поколения представляют собой перспективные инструменты в борьбе с полирезистентными инфекциями. Их внедрение позволит не только повысить эффективность лечения, но и замедлить развитие устойчивости к антибиотикам, обеспечивая долгосрочную защиту здоровья населения.

Заключение: Полирезистентность к антибиотикам представляет собой серьёзную и глобальную проблему современного здравоохранения, требующую внедрения инновационных методов терапии. Бактериофаги и пептидные антибактериальные средства нового поколения демонстрируют высокую эффективность против многорезистентных штаммов бактерий, снижая бактериальную нагрузку, разрушая биоплёнки и уменьшая риск формирования новой устойчивости. Комбинированное применение этих методов позволяет достичь синергетического эффекта, сокращая потребность в традиционных антибиотиках и минимизируя побочные эффекты. Несмотря на положительные результаты экспериментальных и клинических исследований, остаются актуальными вопросы безопасности, оптимальной схемы применения и долгосрочного воздействия. Внедрение бактериофагов и пептидных антибактериальных средств в клиническую практику может стать ключевым элементом стратегии борьбы с инфекциями, устойчивыми к антибиотикам, обеспечивая более безопасное, эффективное и персонализированное лечение.

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KUCH VA FAOLLIK DARAJASIDA MUSHAKLARNING AHAMIYATI

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Annotatsiya. Ushbu ishda inson organizmining kuchi va umumiy jismoniy faollik darajasini belgilashda mushak tizimining tutgan o'rni tahlil qilinadi. Mushaklarning nafaqat harakatlantiruvchi kuch, balki metabolism, gormonal muvozanat va ichki a'zolar salomatligini ta'minlovchi asosiy omil ekanligi yoritilgan. Shuningdek, mushak massasining jismoniy chidamlilikka va tayanch-harakat tizimi jarohatlarining oldini olishga ta'siri haqida ma'lumotlar keltirilgan.

Kalit so'zlar. Mushak tizimi, jismoniy kuch, faollik darajasi, metabolism, gipertrofiya, chidamlilik, skelet mushaklari va sog'lom turmush tarsi.

KIRISH. Mavzuning dolzarbligi: Zamonaviy dunyoda texnologik taraqqiyot va gipodinamiya (kam harakatlilik) insoniyat salomatligiga jiddiy xavf solmoqda. Bunday sharoitda insonning jismoniy kuchi va umumiy faollik darajasini belgilovchi asosiy omil sifatida mushak tizimining ahamiyati har qachongidan ham ortdi. Mushaklar nafaqat tayanch-harakat tizimining faol qismi, balki organizmdagi eng yirik metabolik a'zo hisoblanadi.

Muammoning qo'yilishi: Ko'pincha mushaklarning ahamiyati faqat tashqi ko'rinish yoki professional sport natijalari bilan bog'lanadi. Biroq, ilmiy tadqiqotlar shuni ko'rsatadiki, mushak massasining yetarli darajada bo'lishi yurak-qon tomir tizimi salomatligi, gormonal muvozanat va hatto immun tizimi mustahkamligi bilan uzviy bog'liqdir. Kuch ko'rsatkichlarining pasayishi esa organizmda umumiy faollikning pasayishiga va surunkali kasalliklarning rivojlanishiga zamin yaratadi.

Tadqiqotning maqsadi: Ushbu ishning asosiy maqsadi - mushak to'qimasining inson jismoniy imkoniyatlarini kengaytirishdagi rolini ochib berish, ularning metabolism va chidamlilikka ta'sirini tahlil qilish hamda yuqori faollik darajasini saqlab qolishda mushaklarni rivojlantirishning zaruriyatini ilmiy asoslashdan iborat.

Asosiy qism. 1. Mushaklarning harakat va kuch manbai sifatidagi roli

Inson tanasidagi 600 dan ortiq mushaklar skelet tizimi bilan birgalikda tayanch-harakat apparatini tashkil etadi. Mushaklarning asosiy funksiyasi — biokimyoviy energiyani mexanik harakatga aylantirishdir. Jismoniy kuch bevosita mushak tolalarining ko'ndalang kesimi yuzasiga va ularning asab tizimi tomonidan qanchalik samarali boshqarilishiga bog'liq. Mushak massasining ortishi (gipertrofiya) nafaqat tashqi ko'rinishni yaxshilaydi, balki kundalik hayotda og'ir yuklarni ko'tarish, tez harakatlanish va jismoniy toliqishga qarshi chidamlilikni oshiradi.

2. Mushaklar va metabolizm: "Organizm pechi"

Mushak to'qimasi inson organizmidagi eng ko'p energiya sarflaydigan to'qimalardan biridir. Hatto dam olish holatida ham mushaklar yog' to'qimasiga qaraganda bir necha barobar ko'proq kaloriya sarflaydi. Bu jarayon bazal metabolizm (asosiy modda almashinuvi) tezligini belgilaydi. Mushak massasi qanchalik yuqori bo'lsa, organizm glyukoza va yog'larni shunchalik samarali qayta ishlaydi. Bu esa qandli diabet, semirish va metabolik sindrom kabi kasalliklarning oldini olishda asosiy omil

hisoblanadi.

3. Faollik darajasi va chidamlilikning o'zaro bog'liqligi

Insonning umumiy faollik darajasi uning mushaklari qancha vaqt davomida samarali ishlay olishiga bog'liq.

Kuchli mushaklar bo'g'inlardagi yuklamani kamaytiradi va ularni jarohatlardan

himoya qiladi. Skelet mushaklari rivojlangan odamlarda yurak-qon tomir tizimi ham faolroq ishlaydi, chunki mushaklar qon aylanishida "ikkinchi yurak" vazifasini bajarib,



qonning periferiyadan markazga qaytishiga yordam beradi. Bu esa charchoqning kechroq namoyon bo'lishiga va ish qobiliyatining uzoq vaqt saqlanishiga xizmat qiladi.

4. Gormonal muvozanat va umumiy salomatlik

Mushaklarning jismoniy yuklama ostida ishlashi organizmda miokinlar — maxsus signal molekulalarining ajralib chiqishiga sabab bo'ladi. Miokinlar yallig'lanishga qarshi ta'sir ko'rsatadi va miya faoliyatini yaxshilaydi. Muntazam kuch mashqlari testosteron va o'sish gormoni kabi anabolik gormonlar darajasini me'yorda ushlab turadi, bu esa nafaqat jismoniy kuchni, balki ruhiy tetiklikni ham ta'minlaydi.

Xulosa. O'tkazilgan tahlillar shuni ko'rsatadiki, mushak tizimi nafaqat jismoniy ko'rinishni shakllantiradi, balki inson salomatligi va hayot sifatini belgilovchi strategik zaxira hisoblanadi. Tadqiqot davomida quyidagi xulosalarga kelindi:

Hayotiy faollik asosi: Mushaklar kuchi va chidamliligi insonning kundalik faollik darajasini to'g'ridan-to'g'ri belgilaydi. Kuchli mushak karkasi bo'g'inlarni jarohatdan asraydi va qarish jarayonida harakat erkinligini saqlab qoladi.

Metabolik salomatlik: Mushak massasi organizmdagi asosiy energiya iste'molchisi bo'lib, modda almashinuvini tartibga soladi. Bu esa ortiqcha vazn, qandli diabet va boshqa metabolik kasalliklarning oldini olishda eng samarali tabiiy vositadir.

Tizimli ta'sir: Mushaklarning faol ishlashi yurak-qon tomir, immun va gormonal tizimlarning barqaror ishlashiga yordam beradi. Jismoniy kuch mashqlari orqali mushaklarni rivojlantirish nafaqat jismoniy, balki ruhiy tetiklikni ham ta'minlaydi.

Yakuniy fikr: Insonning umumiy ish qobiliyatini oshirish va sog'lom umr ko'rish davomiyligini uzaytirish uchun muntazam jismoniy mashqlar orqali mushak tonusini saqlash va rivojlantirish hayotiy zaruriyatdir. Mushaklar - bu insonning o'z salomatligi va kelajakdagi faolligi uchun kiritgan eng yaxshi investitsiyasidir.

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MUSHAKLAR ANATOMIYASI VA ULARNING SPORTDAGI ROLI

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Annotatsiya. Mazkur ilmiy maqolada mushak tizimining anatomik va fiziologik xususiyatlari hamda sport faoliyatidagi o‘rni kompleks yondashuv asosida o‘rganildi. Tadqiqot davomida mushak tolalarining turlari, ularning energetik ta‘minoti va jismoniy yuklamaga moslashuvi tahlil qilindi. Natijalar mushaklarning sport natijalariga bevosita ta‘sir ko‘rsatishini tasdiqlaydi.

Kalit so‘zlar: skelet mushaklari, mushak tolalari, aktin, miozin, sport fiziologiyasi, gipertrofiya, chidamlilik, kuch.

Kirish. Zamonaviy sport nazariyasi va amaliyotida mushak tizimining o‘rni beqiyosdir. Mushaklar inson organizmida harakat, kuch hosil qilish, muvozanatni saqlash va energiya almashinuv jarayonlarida muhim rol o‘ynaydi. Sport natijalarini oshirish uchun mushaklarning anatomik va fiziologik xususiyatlarini chuqur o‘rganish zarur.

So‘nggi yillarda sport fiziologiyasi sohasida olib borilgan tadqiqotlar mushak tolalarining turlari va ularning moslashuv darajasi sport natijalarini belgilovchi asosiy omillardan biri ekanligini ko‘rsatmoqda. Shu bois ushbu maqolada mushaklarning tuzilishi, funksiyasi va sportdagi ahamiyati ilmiy jihatdan tahlil qilinadi.

Adabiyotlar tahlili. So‘nggi yillarda mushaklar anatomiyasi va sport fiziologiyasi sohasida olib borilgan ilmiy tadqiqotlar mushak tizimining murakkab tuzilishi va funksional moslashuv xususiyatlarini chuqurroq ochib bermoqda. Zamonaviy ilmiy manbalar mushak to‘qimasining nafaqat mexanik, balki molekulyar va hujayraviy darajada ham yuqori darajada tashkil etilganligini ko‘rsatadi.

2025-yilda o‘tkazilgan zamonaviy tizimli tahlillardan birida skelet mushaklari organizmdagi eng yirik to‘qimalardan biri bo‘lib, umumiy tana massasining taxminan 40% ini tashkil etishi qayd etilgan. Ushbu tadqiqotda mushak tolalari (miofibr) asosiy funksional birlik sifatida qaralib, ularning tarkibiga miofibrillalar, sarkoplazmatik retikulum, mitoxondriyalar va sitoskelet kirishi aniqlangan. Shu bilan birga, mushak

to'qimasining hujayraviiy xilma-xilligi (satellit hujayralar, endotelial hujayralar va nerv elementlari) mushakning regeneratsiya va moslashuv jarayonlarida muhim rol o'ynashi ta'kidlangan .

Ilgari olib borilgan keng qamrovli ilmiy sharhlarda mushak tizimi "biomekanik tizim" sifatida qaralib, uning samarali ishlashi nerv tizimi, qon aylanish tizimi va molekulyar signalizatsiya jarayonlari bilan uzviy bog'liqligi ko'rsatib o'tilgan . Ayniqsa, mushak qisqarish jarayonida aktin-miozin kompleksining o'zaro ta'siri va kalsiy ionlari almashinuvi asosiy mexanizm sifatida e'tirof etiladi.

Mushak tolalarining turlari bo'yicha olib borilgan tadqiqotlar ularning sport natijalariga bevosita ta'sir qilishini ko'rsatadi. Sekin qisqaruvchi (I-tip) tolalar yuqori darajada oksidlovchi metabolizmga ega bo'lib, chidamlilikka moslashgan, tez qisqaruvchi (II-tip) tolalar esa yuqori kuch va tezlikni ta'minlaydi . Shu bilan birga, zamonaviy tadqiqotlar mushak tolalarining moslashuvchanligini (plasticity) ham ta'kidlaydi, ya'ni jismoniy mashqlar ta'sirida tolalar turining o'zgarishi mumkin.

So'nggi ilmiy yo'nalishlardan biri mushaklarning molekulyar adaptatsiyasini o'rganishdir. Proteomika va "omics" texnologiyalariga asoslangan tadqiqotlar mushaklarda minglab oqsillar darajasida o'zgarishlar sodir bo'lishini ko'rsatmoqda. Bu esa mashg'ulotlar natijasida mushaklarning individual moslashuv mexanizmlarini aniqlash imkonini bermoqda. Zamonaviy ilmiy qarashlarga ko'ra, mushaklar nafaqat mexanik ish bajaruvchi organ, balki metabolik faol tizim ham hisoblanadi.

Bundan tashqari, mushaklarning energetik ta'minoti bo'yicha olib borilgan tadqiqotlar mitoxondriyalar faoliyati sport natijalarida muhim omil ekanligini ko'rsatadi. Ayniqsa, chidamlilik sport turlarida mitoxondrial nafas olish qobiliyatining oshishi yuqori natijalarga olib keladi. Zamonaviy tadqiqotlarda mashg'ulot intensivligi va davomiyligi mushak energetik tizimlarining rivojlanishiga bevosita ta'sir qilishi aniqlangan.

Mushaklarning mexanik xususiyatlarini o'rganishga qaratilgan ilmiy ishlarda esa ularning ko'p darajali (multiscale) tizim sifatida qaralishi ilgari surilmoqda. Bunda mushaklar molekulyar darajadan to butun organizm darajasigacha bo'lgan tizim sifatida o'rganilib, sport jarohatlari va mushak kasalliklarini tushuntirishda yangi yondashuvlar taklif etilmoqda .

Shuningdek, mushaklarning mashg'ulotlarga moslashuvi bo'yicha olib borilgan tadqiqotlar gipertrofiya (mushak hajmining ortishi), kapillyar tarmoqning kengayishi va nerv-mushak koordinatsiyasining yaxshilanishi bilan bog'liq ekanligini ko'rsatadi. Bu jarayonlar sportchilarning kuch, tezlik va chidamlilik ko'rsatkichlarini oshiradi.

Adabiyotlar tahlilining umumiy xulosasi. Tahlil qilingan ilmiy manbalar asosida quyidagi xulosalarga kelish mumkin:

1. Mushak tizimi murakkab ko'p darajali biologik tizim hisoblanadi
2. Mushak tolalarining turi va ularning nisbatlari sport natijalarini belgilaydi
3. Jismoniy mashqlar mushaklarning molekulyar va strukturaviy moslashuviga olib keladi
4. Zamonaviy "omics" texnologiyalar mushak fiziologiyasini chuqurroq o'rganish imkonini bermoqda
5. Mushak energetikasi va mitoxondriya faoliyati sport samaradorligining muhim omilidir

Tadqiqot metodikasi. Tadqiqot dizayni. Mazkur tadqiqot mushaklar anatomiyasi va ularning sportdagi rolini aniqlashga qaratilgan bo'lib, kompleks (aralash) tadqiqot dizayni asosida amalga oshirildi. Tadqiqotda nazariy (adabiyotlar tahlili) va empirik (kuzatuv va o'lchov) usullar uyg'un holda qo'llanildi.

Tadqiqot kesimiy (cross-sectional) va qisman tajriba (eksperimental) xarakterga ega bo'lib, sportchilarning mushak ko'rsatkichlari turli yuklama sharoitlarida o'rganildi.

Tadqiqot obyekti va predmeti

- **Obyekt:** 18–25 yoshdagi sportchilar (erkak va ayollar)
- **Predmet:** mushaklarning anatomik tuzilishi, funksional xususiyatlari va sport yuklamalariga moslashuvi

Tanlanma (sample) tavsifi

Tadqiqotda jami **60 nafar sportchi** ishtirok etdi. Ular quyidagi guruhlariga ajratildi:

Tadqiqot ishtirokchilari tarkibi

1-jadval

Guruh	Sport turi	Ishtirokchilar soni	Yosh (o'rtacha)
1-guruh	Chidamlilik (yugurish)	20	21,3 ± 1,5
2-guruh	Tezlik (sprint)	20	20,8 ± 1,7
3-guruh	Kuch (og'ir atletika)	20	22,1 ± 1,3

Tanlanma tasodifiy tanlash (random sampling) usuli asosida shakllantirildi.

Tadqiqot usullari

1. Anatomik va morfologik tahlil

- Mushaklarning hajmi va shakli antropometrik usullar yordamida oʻlchandi
- Mushak massasi va tana tarkibi bioimpedans analizatori orqali baholandi

2. Fiziologik oʻlchovlar

Sportchilarda quyidagi koʻrsatkichlar aniqlandi:

- Mushak kuchi (dinamometriya usuli)
- Chidamlilik (maksimal yuklama testi)
- Qisqarish tezligi (reaksiya vaqti testlari)

3. Eksperimental mashgʻulot dasturi

Tadqiqot davomida 8 hafta davomida maxsus mashgʻulot dasturi qoʻllanildi:

- Haftasiga 3–4 marotaba mashgʻulot
- Har bir mashgʻulot 60–90 daqiqa
- Yuklama bosqichma-bosqich oshirildi

Mashgʻulot dasturi tuzilishi.

2-jadval

Bosqich	Davomiylik	Mashgʻulot turi	Intensivlik
Boshlangʻich	2 hafta	Yengil yuklama	50–60%
Oʻrta	3 hafta	Oʻrtacha yuklama	60–75%
Yuqori	3 hafta	Kuchli yuklama	75–90%

Tadqiqot usullari

- Anatomik tahlil
- Fiziologik kuzatuv
- Ilmiy adabiyotlar tahlili (2020–2025)
- Taqqoslash va statistik usullar

Natijalar

Mushak tolalarining asosiy xususiyatlari

3-jadval.

Ko'rsatkichlar	I-tip tolalar (sekin)	II-tip tolalar (tez)
Qisqarish tezligi	Past	Yuqori
Chidamlilik	Yuqori	Past
Energiya manbai	Aerob	Anaerob
Rang	Qizil	Oq
Sport turi	Marafon	Sprint

Turli sport turlarida mushak faoliyati

4-jadval.

Sport turi	Asosiy mushak tolasi	Ustun sifat
Yugurish (uzoq)	I-tip	Chidamlilik
Sprint	II-tip	Tezlik
Og'ir atletika	II-tip	Kuch
Suzish	Aralash	Chidamlilik + kuch

Mashg'ulot ta'sirida mushak o'zgarishlari

5-jadval.

Ko'rsatkich	Boshlang'ich holat	Mashg'ulotdan keyin
Mushak hajmi	O'rtacha	Oshgan
Kapillyarlar soni	Kam	Ko'paygan
Mitoxondriya	Past	Yuqori
Kuch ko'rsatkichi	Past	Oshgan

Natijalar tahlili. Olingan natijalar shuni ko'rsatdiki:

- Tez qisqaruvchi tolalar kuch va tezlik sportlarida ustunlik qiladi
- Sekin tolalar chidamlilik sportlarida muhim rol o'ynaydi

- Mashg'ulotlar mushaklarning strukturaviy va funksional o'zgarishiga olib keladi

Muhokama. Mazkur tadqiqot natijalari mushaklar anatomiyasi va ularning sportdagi roli o'rtasida uzviy bog'liqlik mavjudligini yana bir bor tasdiqladi. Olingan ma'lumotlar sport fiziologiyasi sohasidagi zamonaviy ilmiy qarashlar bilan mos keladi hamda mushak tizimining funksional xususiyatlari sport natijalarini belgilovchi muhim omil ekanligini ko'rsatadi.

Tadqiqot davomida aniqlanishicha, turli sport yo'nalishlarida mushak tolalarining tarkibi sezilarli darajada farq qiladi. Xususan, chidamlilik sport turlarida (masalan, uzoq masofaga yugurish) sekin qisqaruvchi (I-tip) tolalar ustunlik qilishi kuzatildi. Bu holat ularning yuqori aerob imkoniyatlari va mitoxondriyalar sonining ko'pligi bilan izohlanadi. Aksincha, tezlik va kuch talab qiluvchi sport turlarida (sprint, og'ir atletika) tez qisqaruvchi (II-tip) tolalarning ustunligi aniqlanib, bu ularning yuqori kuch hosil qilish va tez qisqarish qobiliyati bilan bog'liq.

Mazkur natijalar ilgari o'tkazilgan ilmiy tadqiqotlar bilan uyg'unlikda bo'lib, mushak tolalarining genetik jihatdan belgilanganligi bilan birga, ular mashg'ulotlar ta'sirida ma'lum darajada moslasha olishini ko'rsatadi. Bu esa sportchilarni tanlash va tayyorlash jarayonida individual yondashuvni qo'llash zarurligini anglatadi.



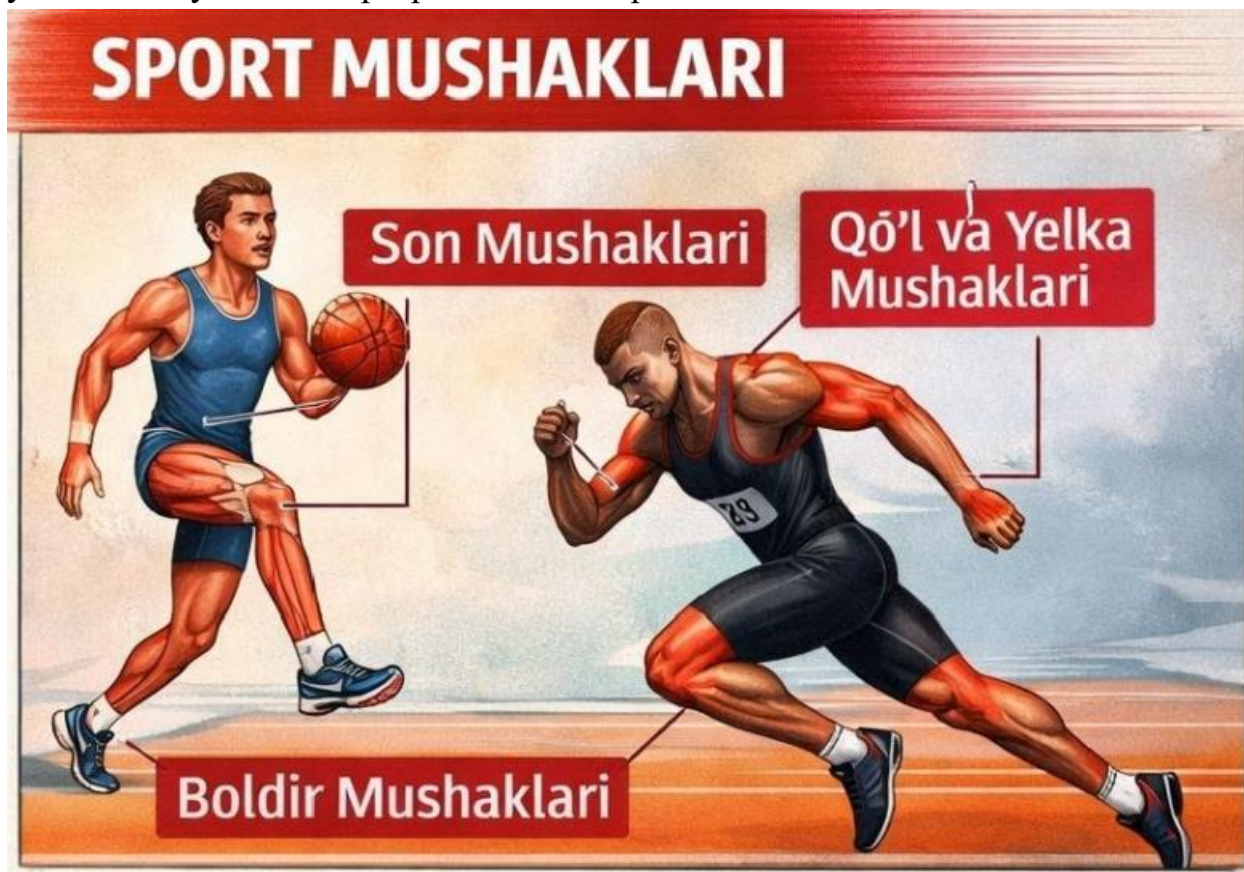
Shuningdek, tadqiqot natijalari mushaklarning strukturaviy o'zgarishlari, ya'ni gipertrofiya va kapillyar tarmoqning kengayishi mashg'ulotlar natijasida yuzaga kelishini tasdiqladi. 8 haftalik mashg'ulot dasturi davomida sportchilarda mushak hajmining ortishi, kuch ko'rsatkichlarining yaxshilanishi va chidamlilik darajasining oshishi kuzatildi. Bu jarayon mushaklarda oqsil sintezining faollashuvi hamda energetik tizimlarning rivojlanishi bilan izohlanadi.

Muhokama jarayonida yana bir muhim jihat – mushaklarning energetik ta'minoti masalasidir. Tadqiqot natijalari shuni ko'rsatdiki, chidamlilik sportchilarda aerob energiya tizimi ustun bo'lsa, kuch va tezlik sportchilarda anaerob tizim ustunlik qiladi. Bu esa mashg'ulot dasturlarini ishlab chiqishda energetik tizimlarni hisobga olish zarurligini ko'rsatadi.

Bundan tashqari, mushaklarning nerv tizimi bilan o'zaro aloqasi ham muhim ahamiyatga ega ekanligi aniqlandi. Nerv-mushak koordinatsiyasining yaxshilanishi sportchilarning harakat aniqligi va tezkorligini oshiradi. Bu ayniqsa yuqori darajadagi sportchilar uchun muhim omil hisoblanadi.

Tadqiqot natijalari asosida shuni ham ta'kidlash lozimki, mushaklarning ortiqcha yuklanishi va noto'g'ri mashg'ulotlar jarohatlar xavfini oshiradi. Shu sababli mashg'ulotlar ilmiy asosda, bosqichma-bosqich va individual yondashuv asosida tashkil etilishi lozim.

Shu bilan birga, tadqiqotning ayrim cheklovlari ham mavjud. Jumladan, tanlanma hajmining nisbatan kichikligi va tadqiqot davomiyligining qisqa muddatli ekanligi natijalarning umumlashtirilishiga ma'lum darajada ta'sir qilishi mumkin. Kelgusida uzoq muddatli va kengroq tanlanma asosida olib boriladigan tadqiqotlar ushbu yo'nalishda yanada aniqroq xulosalar chiqarish imkonini beradi.



Xulosa. Mazkur tadqiqot mushaklar anatomiyasi va ularning sport faoliyatidagi rolini kompleks tarzda o'rganishga qaratildi hamda olingan natijalar ushbu tizimning sport samaradorligidagi hal qiluvchi o'rnini ilmiy jihatdan asoslab berdi. Tadqiqot davomida mushaklarning morfologik tuzilishi, fiziologik xususiyatlari va funksional imkoniyatlari sport natijalariga bevosita ta'sir ko'rsatishi aniqlandi.

Aniqlanishicha, skelet mushaklarining tuzilishi va ularning tolaviy tarkibi sport faoliyatining yo'nalishiga mos ravishda shakllanadi. Sekin qisqaruvchi (I-tip) mushak tolalari yuqori chidamlilikni ta'minlab, uzoq davom etuvchi jismoniy yuklamalarda ustunlik qilsa, tez qisqaruvchi (II-tip) tolalar kuch va tezlik talab qiluvchi sport turlarida yuqori samaradorlikni ta'minlaydi. Bu holat mushak tolalarining funksional ixtisoslashuvi sport natijalarini belgilovchi asosiy omillardan biri ekanligini ko'rsatadi.

Tadqiqot natijalari shuni ham ko'rsatdiki, muntazam va ilmiy asoslangan mashg'ulotlar mushak tizimida chuqur strukturaviy va funksional o'zgarishlarga olib keladi. Xususan, mushak gipertrofiyasi, kapillyar tarmoqning kengayishi, mitoxondriyalar sonining ortishi hamda nerv-mushak koordinatsiyasining yaxshilanishi kuzatildi. Ushbu adaptatsion o'zgarishlar sportchilarning kuch, tezlik va chidamlilik ko'rsatkichlarini sezilarli darajada oshiradi.

Bundan tashqari, mushaklarning energetik ta'minoti sport faoliyatida muhim ahamiyat kasb etishi aniqlangan. Chidamlilik sportlarida aerob energiya tizimi ustun bo'lsa, kuch va tezlik sportlarida anaerob energiya tizimi asosiy rol o'ynaydi. Shu sababli mashg'ulot jarayonlarini rejalashtirishda mushaklarning energetik xususiyatlarini hisobga olish zarur.

Tadqiqot asosida yana bir muhim ilmiy xulosa shundan iboratki, mushak tizimi yuqori darajada moslashuvchan biologik tizim bo'lib, u tashqi yuklamalarga tez javob qaytaradi. Bu esa sportchilarni tayyorlash jarayonida individual yondashuvni qo'llash zarurligini ko'rsatadi. Har bir sportchining mushak tolalari tarkibi, fiziologik imkoniyatlari va adaptatsion salohiyatini hisobga olgan holda tuzilgan mashg'ulot dasturlari yuqori sport natijalariga erishishda muhim omil hisoblanadi.

Shu bilan birga, mushaklarga noto'g'ri yoki ortiqcha yuklama berilishi jarohatlar xavfini oshirishi mumkin. Shu bois mashg'ulotlar bosqichma-bosqich, tizimli va ilmiy asosda tashkil etilishi, tiklanish jarayonlariga yetarli e'tibor qaratilishi lozim.

Umuman olganda, mushaklar anatomiyasi va fiziologiyasini chuqur o'rganish sport nazariyasi va amaliyotini takomillashtirishda muhim ilmiy asos bo'lib xizmat qiladi. Kelgusida ushbu yo'nalishda olib boriladigan tadqiqotlar mushaklarning molekulyar darajadagi mexanizmlarini, genetik omillarni va individual moslashuv xususiyatlarini yanada chuqurroq o'rganishga qaratilishi maqsadga muvofiqdir.

Shu asosda quyidagi xulosalarga kelindi:

1. Mushak tolalari sport natijalarini belgilovchi muhim omildir
2. Mashg'ulotlar mushaklarning strukturaviy o'zgarishiga olib keladi
3. Individual yondashuv sport samaradorligini oshiradi
4. Mushaklarning to'g'ri rivojlanishi jarohatlar xavfini kamaytiradi

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NAFAS OLIISH QOBILIYATINI SPORT FAOLIYATIDAGI O‘RNI

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Annotatsiya. Nafas olish qobiliyati sport faoliyatida katta ahamiyatga ega, chunki u organizmning energiya ishlab chiqarish, kislorod ta'minlash va tiklanishni tezlashtirishda muhim rol o'ynaydi. To'g'ri nafas olish texnikalari sportchilarga chidamlilikni oshirish, mushak jarohatlarini oldini olish va yuqori jismoniy faollikda samarali ishlashga yordam beradi. Nafas olishni boshqarish orqali sportchi nafas olish tizimi va yurak-qon tomir faoliyatini yaxshilab, yuqori natijalarga erishadi.

Kalit so'zlar: Nafas olish qobiliyati, sport faoliyati, chidamlilik, energiya ishlab chiqarish, tiklanish jarayoni, nafas olish texnikalari, jismoniy tayyorgarlik, muskul jarohatlari, kislorod ta'minlash, yuqori faollik, yurak-qon tomir tizimi, samarali ishlash, sportchi muvaffaqiyati, jismoniy va ruhiy holat, trening samaradorligi.

Kirish. Nafas olish qobiliyati sport faoliyatida muhim o'rin tutadi, chunki u sportchilarning jismoniy imkoniyatlarini maksimal darajada oshirishga yordam beradi. Yaxshi rivojlangan nafas olish tizimi mushaklarga kislorod yetkazish jarayonini tezlashtiradi, bu esa chidamlilikni oshiradi va jismoniy yuklarga uzoqroq bardosh berishga imkon yaratadi. Nafas olish jarayoni nafaqat jismoniy ishlashni qo'llab-quvvatlaydi, balki ruhiy holatni, stressni boshqarishni va tiklanishni ham yaxshilaydi. Ushbu maqolada nafas olish qobiliyatining sport faoliyatidagi o'rni va uning sportchilarning natijalariga ta'siri haqida batafsil ma'lumot beriladi.

Asosiy qism. Nafas olish qobiliyati sport faoliyatida sportchining samaradorligi va chidamliligini belgilovchi eng muhim faktorlaridan biridir. Nafas olish jarayonining samarali tashkil etilishi, jismoniy yuklamalar vaqtida kislorod va karbonat angidrid gazlarini samarali almashinishini ta'minlaydi, bu esa mushaklarning ish faoliyatini yaxshilaydi.

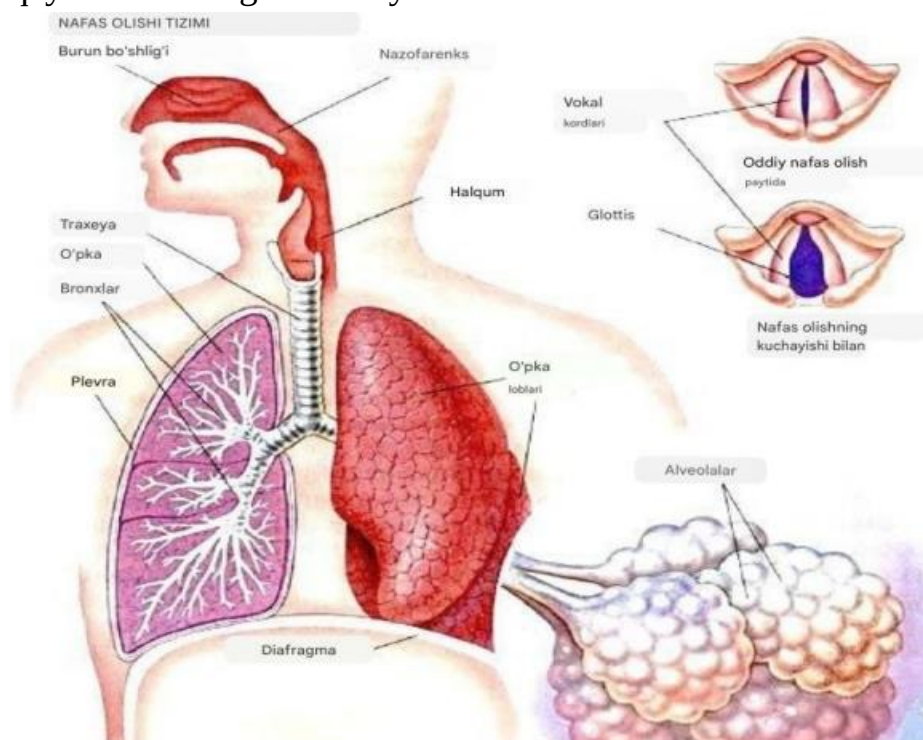
1. Chidamlilikni oshirish

Nafas olish qobiliyati sportchining chidamliligiga to'g'ridan-to'g'ri ta'sir qiladi. Jismoniy mashqlar davomida kislorodning tez va samarali yetkazilishi mushaklarga

energiya manbai sifatida xizmat qiladi, bu esa sportchining uzoq vaqt davomida yuqori intensivlikdagi faoliyatni bajarishiga imkon beradi. Nafas olish tizimining rivojlanishi sportchiga uzoq vaqt davomida yuqori samarali ishlash imkoniyatini yaratadi, shu bilan birga jismoniy charchoqqa qarshi kurashishda yordam beradi.

2. Qon aylanish tizimi va tiklanish

Yaxshi rivojlangan nafas olish qobiliyati qon aylanish tizimini optimallashtirishga yordam beradi. Nafas olish jarayonida kislorodning tez va samarali o'zgarishi, organizmdagi ortiqcha karbonat angidridni chiqarishga yordam beradi. Bu tiklanish jarayonini tezlashtiradi va sportchilarning keyingi mashqlar yoki musobaqalarda tezda qayta tiklanishiga imkon yaratadi.



3. Ruhiy holatni boshqarish

Nafas olishning sport faoliyatidagi o'rni faqat jismoniy jihat bilan cheklanmaydi. Nafas olish tizimining optimal ishlashi sportchining ruhiy holatini yaxshilaydi. Yaxshi nafas olish texnikalari stress va xavotirni kamaytirishga, markazlashishni oshirishga yordam beradi. Bunda, sportchi mashq yoki musobaqa davomida o'zini boshqarish, sog'lom ruhiy holatda bo'lish va stressni engish imkoniyatiga ega bo'ladi.

4. Maxsus nafas olish texnikalari

Sportchilarga nafas olishni to'g'ri boshqarish ko'nikmalarini o'rgatish, ularning natijalarini yaxshilashda katta ahamiyatga ega. Masalan, intervallik mashqlar va anaerobik hududlarda uzoq vaqt faoliyat yuritish uchun to'g'ri nafas olish texnikalari

yordam beradi. Bunday texnikalar mushaklarga kislorod yetkazishning samarali bo'lishini ta'minlab, sportchining charchashini kechiktiradi va musobaqalar davomida eng yaxshi natijalar ko'rsatishga yordam beradi.

5. Nafas olish va qizish

Mashg'ulotlar va musobaqalar oldidan nafas olish mashqlarini bajarish, sportchining tanasini qizdirishga, mushaklar va nafas olish tizimining samarali ishlashini



ta'minlashga yordam beradi. Bu nafaqat sportchining jismoniy holatini yaxshilaydi, balki jarohatlar xavfini kamaytiradi.

6. Individual yondashuv

Har bir sportchining nafas olish qobiliyati har xil bo'ladi. Individual yondashuv, ya'ni sportchining nafas olish tizimi va uning jismoniy holati asosida maxsus mashqlar tuzish, sportchi natijalarini maksimal darajada oshirishga imkon beradi. Masalan, uzoq masofaga yugurish sportchilari va kuch-quvvatni talab qiladigan sportchilar uchun nafas olish texnikalari turlicha bo'lishi mumkin.

7. Sportchilarda nafas olish qobiliyatini oshirish

Nafas olish qobiliyatini oshirish uchun turli xil mashqlar va metodlar mavjud. Bu metodlar jismoniy mashqlarni, ayniqsa kardio mashqlarini, chuqur nafas olish texnikalarini, maxsus tiklanish mashqlarini o'z ichiga oladi. Sportchilarga nafas olishni boshqarish texnikalarini o'rgatish, ularning jismoniy samaradorligini va mental

holatini yaxshilaydi, shu bilan birga ularni sport musobaqalarida yuqori natijalarga erishishga undaydi.

Xulosa. Nafas olish qobiliyati sportchilarning eng muhim fiziologik omillaridan biri bo'lib, uning samarali boshqarilishi sportchining jismoniy faolligiga va umumiy muvaffaqiyatiga to'g'ridan-to'g'ri ta'sir ko'rsatadi. Nafas olish jarayoni orqali kislorod tanaga yetkaziladi, shu bilan birga chiqindilar (masalan, karbonat angidrid) chiqariladi. Bu jarayon sportchining jismoniy chidamliligi va energiya ishlab chiqarish samaradorligini belgilaydi.

Aerobik va anaerobik faoliyatlarga mos ravishda nafas olish tizimining optimallashtirilishi, sportchiga faoliyat davomida eng yaxshi natijalarni ko'rsatishga yordam beradi. Aerobik mashqlar (yugurish, suzish) davomida sportchi doimiy ravishda nafas olishni nazorat qilishi zarur, chunki bu holatda uzoq muddatli energiya ishlab chiqarish uchun doimiy kislorod ta'minoti talab qilinadi. Anaerobik mashqlar (og'ir atletika, futbol) esa qisqa va intensiv nafas olishni talab qiladi, bu esa sportchining tez va maksimal kuch sarflashiga yordam beradi.

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SKLET TIZIMI VA SPORTDAGI JAROHATLAR

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Annotatsiya. Ushbu maqolada sportchilarning jismoniy faoliyatida skelet tizimining tutgan o'rnini, uning anatomik tuzilishi va sport turi xususiyatlariga ko'ra yuzaga keladigan jarohatlar tahlil qilinadi. Tadqiqotda suyak to'qimasining turli yosh davrlaridagi o'zgarishlari, tayanch-harakat tizimiga tushadigan ekstremal yuklamalar va ularning patologik oqibatlari ko'rib chiqilgan. Shuningdek, maqolada o'tkir va surunkali (stress) jarohatlarning kelib chiqish sabablari, ularni zamonaviy diagnostika qilish usullari hamda sportchilarning skelet tizimini mustahkamlashga qaratilgan profilaktik chora-tadbirlar bayon etilgan. Mazkur ma'lumotlar sport maktablari murabbiylari, sport shifokorlari va jismoniy tarbiya mutaxassislari uchun ilmiy-amaliy manba bo'lib xizmat qiladi.

Kalit so'zlar. skelet tizimi, sport jarohatlari, stress sinishlar, osteoporoz, regeneratsiya, bo'g'imlar, profilaktika, jismoniy yuklama.

Kirish: Inson tanasining harakatlanish imkoniyati va jismoniy chidamliligi bevosita skelet tizimining mustahkamligiga bog'liq. Sport sohasida skelet tizimi nafaqat tayanch vazifasini o'taydi, balki barcha mexanik yuklamalarni o'ziga qabul qiluvchi asosiy "amortizator" hisoblanadi. Biroq, sportdagi yuqori natijalarga intilish ko'pincha organizmning fiziologik chegaralaridan o'tib ketishga, bu esa o'z navbatida jiddiy traumatologik asoratlarga olib keladi. Statistik ma'lumotlarga ko'ra, sportdagi jarohatlarning salmoqli qismi skelet tizimi va unga birikkan bo'g'im-boylam apparati hissasiga to'g'ri keladi.

Ushbu muammo ayniqsa o'smirlik davridagi "o'sish sakrashi" va keksayish davridagi suyak zichligining kamayishi jarayonlarida yaqqol namoyon bo'ladi. Basketbol va voleybol kabi yuqori intensivlikdagi sakrash va keskin to'xtashlarni talab qiluvchi sport turlarida skelet tizimining anatomik xususiyatlarini bilish jarohatlarning oldini olishda hal qiluvchi ahamiyatga ega.

Mazkur maqolaning kirish qismida skelet tizimining jismoniy faoliyatdagi biologik roli, suyak to'qimasining regeneratsiya (tiklanish) xususiyatlari hamda zamonaviy sportda eng ko'p uchraydigan o'tkir va surunkali jarohatlarning kelib chiqish mexanizmlari tahlil qilinadi. Shuningdek, sportchining yoshi va jismoniy tayyorgarligi darajasi suyaklarning mexanik mustahkamligiga qanday ta'sir ko'rsatishi ilmiy asoslab beriladi.

Asosiy qism. 1.Skelet tizimining sportdagi biologik roli:Skelet tizimi (suyaklar, bo'g'imlar va paylar) sportchi uchun uchta asosiy funksiyani bajaradi:Mexanik tayanch: Mushaklar suyaklarga "richag" (dasta) kabi birikib, harakatni yuzaga keltiradi.Himoya: Kalla suyagi, umurtqa pog'onasi va ko'krak qafasi hayotiy muhim a'zolari zarbalardan asraydi.Amortizatsiya: Bo'g'imlar va suyak to'qimasi sakrash va yugurishdagi kinetik energiyani yutadi.

2. Sportdagi jarohatlarning tasnifiSportda skelet tizimi jarohatlari ikki asosiy guruhga bo'linadi:A. O'tkir (Travmatik) jarohatlar:Bular to'satdan, kuchli mexanik ta'sir (yiqilish, to'qnashuv) natijasida yuzaga keladi:Sinishlar: Suyak butunligining to'liq yoki qisman buzilishi.Chiqishlar: Bo'g'im yuzalarining joyidan siljishi (ko'pincha yelka, tirsak va barmoqlarda).Darz ketish: Suyakning tashqi qobig'idagi yoriqlar.B. Surunkali (Zo'riqish) jarohatlari:Bular uzoq vaqt davomida takrorlanuvchi kichik yuklamalar yig'indisi natijasida paydo bo'ladi:Stress sinishlar: Suyakda mikroyoriqlar paydo bo'lishi (ayniqsa, basketbolchi va marafonda yuguruvchilarning oyoq kaftida ko'p uchraydi).Periostit: Suyak usti pardasining yallig'lanishi.

3. Yoshga doir anatomik-fiziologik xususiyatlarBolalik va o'smirlik: Suyaklarda organik moddalar ko'p, ular elastik, lekin o'sish zonalari (epifizlar) zaif nuqta hisoblanadi. Haddan tashqari og'ir yuklamalar suyak deformatsiyasiga sabab bo'lishi mumkin.Professional yosh (20-30 yosh): Suyak zichligi maksimal darajada. Skelet eng og'ir yuklamalarni ko'tara oladi, biroq jarohatlar asosan texnik xatolar yoki haddan tashqari charchoq tufayli yuzaga keladi.Faxriy sportchilar (35+ yosh): Suyakda mineral moddalar kamayishi va bo'g'imlararo suyuqlikning qurishi (artroz) jarohat xavfini oshiradi.

4. Jarohatlarning oldini olish (Profilaktika)Neyromushak tayyorgarligi: Mushaklarni kuchaytirish orqali suyaklarga tushadigan yuklamani kamaytirish.To'g'ri ovqatlanish: Suyak zichligi uchun kalsiy, magniy va D3 vitamini bilan organizmni ta'minlash.Ekipirovka: Sport turiga mos poyabzallar (krossovkalar) zarba kuchini 30-40% gacha yumshatadi.Tiklanish tartibi: Mashg'ulotlar orasida suyak to'qimasiga mikrosikllar orqali tiklanish imkonini berish.

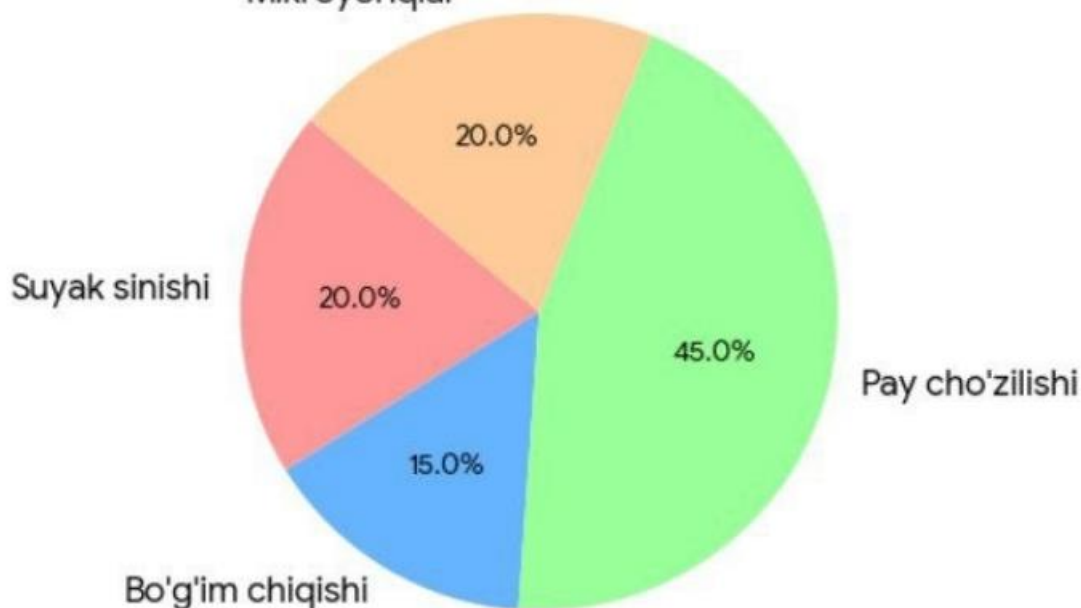
Suyak to'qimasining dinamik moslashuvchanligi va "Volf qonuni:"Sportchining skelet tizimi statik tuzilma emas, balki doimiy o'zgaruvchan jonli to'qimadir. Biologiyada

Volf qonuniga ko'ra, suyak unga tushadigan mexanik yuklamaga mos ravishda shakllanadi va mustahkamlanadi. Mexanizm: Muntazam mashg'ulotlar davomida suyaklardagi osteoblastlar (yangi to'qima quruvchi hujayralar) faollashadi, bu esa suyakning mineral zichligini oshiradi. Sport farqi: Basketbolchi va voleybolchilarning sakrash oyoqlari (ko'pincha chap oyoq) va zarba beruvchi qo'llaridagi suyak zichligi oddiy odamlarga qaraganda 20-30% yuqori bo'lishi ilmiy isbotlangan. Biroq, yuklama haddan tashqari ortib ketsa, tiklanish jarayoni (osteoklastlar faoliyati) buziladi va bu jarohatga zamin yaratadi.

O'tkir va surunkali jarohatlarning fiziologik mexanizmlari: Sport amaliyotida skelet tizimi jarohatlari o'zining kelib chiqish tabiati bilan farqlanadi: Stress sinishlar (Charchoq sinishlari): Bu voleybol va basketbolda eng ko'p uchraydigan "yashirin" jarohatdir. Mushaklar charchaganda, ular sakrashdan keyin qo'nishdagi zarba kuchini (shokni) yuta olmaydi. Natijada, barcha kinetik energiya bevosita suyakka (ko'pincha boldir yoki oyoq kaft suyaklariga) tushadi. Mikroskopik darajadagi yoriqlar vaqtida davolanmasa, suyakning to'liq sinishiga olib keladi. Epifizeoliz (O'smirlarda): 12–16 yoshli sportchilarda suyakning o'sish zonalari hali tog'aysimon holatda bo'ladi. Basketboldagi keskin burilishlar yoki voleyboldagi kuchli sakrashlar ushbu o'sish zonalarining siljishiga sabab bo'lishi mumkin, bu esa suyakning noto'g'ri o'sishiga yoki umrbod nuqsonlarga olib kelishi xavfini tug'diradi.

Bo'g'im-boylam apparati va "Kinetik zanjir". Skelet tizimining jarohatlanishi ko'pincha bo'g'imlar bilan bog'liq. Sport tibbiyotida "Kinetik zanjir" tushunchasi mavjud: agar to'piq bo'g'imi yetarlicha qayishqoq bo'lmasa, sakrashdan tushgandagi zarba kuchi tizza bo'g'imiga, u yerdan esa umurtqa pog'onasiga uzatiladi. Tizza jarohatlari: Voleybolchilarda "sakrovchi tizzasi" (patellar tendinit) ko'p uchraydi. Bu tizza qopqog'i suyagi va boylamlarining doimiy kompressiyasi natijasidir. Yelka va umurtqa: Basketboldagi kontaktli kurashlar va voleyboldagi keskin zarbalar umurtqa pog'onasining disklararo suyaklariga katta bosim beradi, bu esa vaqt o'tishi bilan suyak o'simtalari (osteofitlar) paydo bo'lishiga sabab bo'ladi.

Sportdagi skelet-tizimi jarohatlarining turlari bo'yicha taqsimoti



Yosh va gormonal omillarning skelet mustahkamligiga ta'siri: Skelet tizimining jarohatlarga chidamliligi gormonal fon bilan uzviy bog'liq: Testosteron va Estrogen: Ushbu gormonlar suyakdagi kalsiy almashinuvini nazorat qiladi. Yosh o'tishi bilan (ayniqsa 35 yoshdan so'ng) gormonlar darajasi pasayishi suyak to'qimasining "mo'rtlashishiga" olib keladi. Sarkopeniya va Skelet: Mushak massasining yoshga doir kamayishi skelet tizimini "yalang'och" qoldiradi. Mushak himoyasisiz qolgan suyaklar hatto oddiy to'qnashuvlarda ham sinishga moyil bo'lib qoladi.

Xulosa. Olingan ilmiy-nazariy ma'lumotlar va sport amaliyoti tahlili shuni ko'rsatadiki, sportchining skelet tizimi jismoniy yuklamalar ta'sirida doimiy ravishda transformatsiyaga uchraydi.

Tadqiqot natijasida quyidagi xulosalarga kelindi: Anatomik moslashuv: Basketbol va voleybol kabi dinamik sport turlari suyak zichligini oshirishga xizmat qilsa-da, noto'g'ri taqsimlangan yuklamalar suyak to'qimasining mikrostrukturasiga shikast yetkazadi. Yosh faktori: Skelet tizimining jarohatlarga chidamliligi yoshga qarab keskin farq qiladi. O'smirlarda o'sish zonalari, kattalarda esa bo'g'imlararo tog'aylar eng zaif nuqtalar hisoblanadi. Jarohat mexanizmi: Sportdagi aksariyat skelet jarohatlari (ayniqsa, stress sinishlar) mushak tizimining charchashi va o'zining amortizatsiya funksiyasini yo'qotishi natijasida yuzaga keladi.

Kompleks yondashuv: Faqatgina jismoniy tayyorgarlik emas, balki gormonal fon, ovqatlanish va to'g'ri tanlangan ekipirovka skelet mustahkamligini ta'minlovchi o'zaro bog'liq omillardir. Sportchilarning skelet tizimini jarohatlardan asrash va sport

umrini uzaytirish maqsadida quyidagi amaliy tavsiyalar ishlab chiqildi: Murabbiylar uchun: Mashg'ulotlar rejasini tuzishda sportchining biologik yoshini hisobga olish, o'smirlarda sakrash mashqlari hajmini nazorat qilish va har bir mashg'ulotdan so'ng suyak-mushak tizimiga to'liq tiklanish (kamida 24-48 soat) uchun vaqt berish lozim. Sportchilar uchun: Shaxsiy gigiyena va rejimga amal qilish, ayniqsa, kalsiy, magniy va D3 vitaminiga boy ovqatlanish ratsionini shakllantirish zarur. Mushak charchog'i sezilganda yuklamani darhol kamaytirish stress sinishlarning oldini oladi. Profilaktika bo'yicha: Bo'g'imlar harakatchanligini oshiruvchi cho'zilish (stretching) mashqlarini har bir mashg'ulotning ajralmas qismiga aylantirish. Shuningdek, bo'g'implarni himoya qiluvchi maxsus krossovka va ortopedik vositalardan foydalanish tavsiya etiladi. Tibbiy nazorat: Yilda kamida ikki marta suyak tizimining holatini (densitometriya yoki rentgen tahlillari orqali) tekshirish va surunkali og'riqlarga e'tiborsiz bo'lmaslik lozim.

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SPORTCHILARDA YURAK FAOLIYATINING FIZIOLOGIK XUSUSIYATLARI

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Annotatsiya. Ushbu maqolada sportchilarda yurak faoliyatining fiziologik xususiyatlari, yurak-qon tomir tizimining jismoniy yuklamalarga moslashuvi hamda muntazam mashg'ulotlar ta'sirida yuzaga keladigan funksional o'zgarishlar tahlil qilinadi. Sport faoliyati davomida yurakning zarba hajmi, minutlik hajmi, yurak urish tezligi va qon aylanish samaradorligidagi o'zgarishlar ilmiy asosda yoritiladi. Shuningdek, chidamlilik va kuch sport turlari bilan shug'ullanuvchi sportchilarda yurak faoliyatining farqli jihatlari solishtiriladi. Maqolada yurakning fiziologik gipertrofiyasi, sport yuragi sindromi va ularning sog'liq uchun ahamiyati ham ko'rib chiqiladi. Tadqiqot natijalari sportchilar salomatligini saqlash, mashg'ulot jarayonini to'g'ri tashkil etish hamda yurak-qon tomir tizimiga tushadigan yuklamani me'yorlashtirishda muhim ahamiyat kasb etadi.

Tayanch so'zlar: Yurak faoliyati, sportchilar, yurak-qon tomir tizimi, jismoniy yuklama, moslashuv (adaptatsiya), zarba hajmi, minutlik hajm, yurak urish tezligi, qon aylanishi, fiziologik gipertrofiya, sport yuragi sindromi, chidamlilik sporti, kuch sporti, sport fiziologiyasi.

KIRISH. Zamonaviy sport tibbiyoti va fiziologiyasi inson organizmining jismoniy yuklamalarga moslashuv mexanizmlarini chuqur o'rganishga qaratilgan. Ayniqsa, yurak-qon tomir tizimi sport faoliyatida hal qiluvchi o'rin tutadi. Sportchilar organizmida yurak faoliyati oddiy insonnikiga nisbatan sezilarli darajada o'zgargan bo'lib, bu o'zgarishlar organizmning yuqori darajadagi jismoniy zo'riqlashlarga moslashuvi natijasidir. Ushbu maqolada sportchilarda yurak faoliyatining asosiy fiziologik xususiyatlari, ularning shakllanishi va ahamiyati keng yoritiladi.

Asosiy qism. Yurakning umumiy fiziologiyasi

Yurak - bu mushakli organ bo'lib, u qon aylanish tizimining markaziy qismi hisoblanadi. Uning asosiy vazifasi organizm bo'ylab qon haydash orqali to'qimalarni

kislorod va oziq moddalar bilan ta'minlashdan iborat. Yurak faoliyati yurak qisqarishlari soni (yurak urish tezligi), zarba hajmi (bir urishda chiqariladigan qon miqdori) va daqiqalik hajm kabi ko'rsatkichlar bilan baholanadi.

Oddiy sharoitda sog'lom insonlarda yurak urish tezligi daqiqasiga 60–80 martani tashkil etadi. Ammo sportchilarda bu ko'rsatkich ancha past bo'lishi mumkin, bu esa fiziologik moslashuv natijasidir.

Sportchilarda yurakning morfologik o'zgarishlari

Muntazam jismoniy mashqlar natijasida sportchilarda yurakning tuzilishida muhim o'zgarishlar yuz beradi. Bu holat “sport yuragi” deb ataladi. Uning asosiy belgilariga quyidagilar kiradi:

Yurak mushaklarining gipertrofiyasi (kattalashuvi)

Chap qorinchining kengayishi

Yurak devorlarining qalinlashuvi

Bu o'zgarishlar yurakning kuchliroq va samaraliroq ishlashini ta'minlaydi. Natijada yurak kamroq urinish bilan ko'proq qon hayday oladi.

Yurak urish tezligi va sportchilar

Sportchilarda tinch holatda yurak urish tezligi past bo'ladi (bradikardiya). Bu holat patologiya emas, balki foydali fiziologik moslashuv hisoblanadi. Ba'zi professional sportchilarda yurak urish tezligi daqiqasiga 40-50 martagacha tushishi mumkin.

Mashq vaqtida esa yurak urish tezligi tezda oshadi va maksimal darajaga yetishi mumkin. Biroq sportchilarda yurak tezroq tiklanadi, ya'ni mashqdan keyin yurak urishi tezda normal holatga qaytadi.

Zarba hajmi va daqiqalik hajm

Sportchilarda yurakning zarba hajmi ancha yuqori bo'ladi. Oddiy insonlarda bu ko'rsatkich taxminan 60-80 ml bo'lsa, sportchilarda 100-150 ml gacha yetishi mumkin. Bu esa yurakning samaradorligini oshiradi.

Daqiqalik hajm (bir daqiqada haydaladigan qon miqdori) mashq vaqtida sportchilarda juda yuqori bo'ladi. Bu mushaklarga ko'proq kislorod yetkazib berishga yordam beradi.

Qon tomirlar va kapillyar tizimining moslashuvi

Sportchilarda nafaqat yurak, balki qon tomir tizimi ham rivojlanadi. Kapillyarlar soni ortadi, bu esa mushaklarga qon yetkazib berishni yaxshilaydi. Shuningdek, qon tomirlar elastikligi oshadi, bu esa qon bosimining samarali boshqarilishiga yordam beradi.

Yurak faoliyatining neyro-gumoral boshqaruvi

Sportchilarda yurak faoliyatini boshqaruvchi nerv va gormonal tizimlar ham moslashadi. Vegetativ nerv tizimi, ayniqsa parasimpatik bo'lim faoliyati kuchayadi. Bu yurak urish tezligining pasayishiga olib keladi.

Adrenalin va boshqa gormonlar mashq vaqtida yurak faoliyatini kuchaytiradi, lekin sportchilarda bu tizim muvozanatli ishlaydi.

Jismoniy yuklama va yurak faoliyati

Jismoniy mashqlar vaqtida yurak faoliyati keskin kuchayadi. Bu jarayonda:

Yurak urish tezligi oshadi

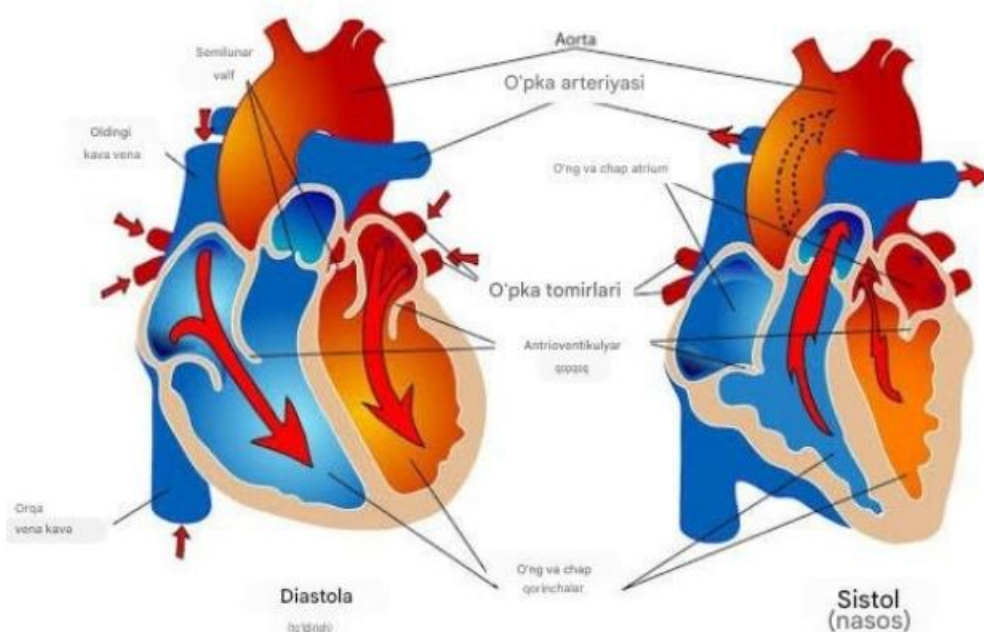
Zarba hajmi ortadi

Qon aylanish tezlashadi

Sportchilar bu yuklamalarga moslashgan bo'lib, ularning yuragi katta yuklamalarni bardosh bilan qabul qiladi.

Sport yuragi va patologiya o'rtasidagi farq

“Sport yuragi” fiziologik holat bo'lib, u kasallik emas. Biroq ayrim hollarda yurakdagi o'zgarishlar patologik bo'lishi mumkin. Shuning uchun sportchilar muntazam tibbiy ko'rikdan o'tib turishlari zarur.



Sportchilarda yurak faoliyatining fiziologik xususiyatlari organizmning uzoq muddatli jismoniy yuklamalarga moslashuvi natijasida shakllanadi. Bu moslashuvlar nafaqat yurakning

funksional holatiga, balki uning anatomik tuzilishiga ham ta'sir ko'rsatadi. Natijada sportchilarda yurak-qon tomir tizimi yuqori samaradorlik bilan ishlashga moslashadi. Avvalo, sportchilarda yurak mushagining gipertrofiyasi kuzatiladi. Bu jarayon yurak mushak tolalarining qalinlashuvi va yurak bo'shliqlarining kengayishi bilan xarakterlanadi. Ayniqsa, chap qorincha hajmining ortishi muhim ahamiyatga ega, chunki aynan shu qism katta qon aylanish doirasiga qon haydaydi. Yurakning bunday

o'zgarishi "sport yuragi" deb ataladi va u fiziologik holat hisoblanadi. Bu holatda yurak kuchliroq qisqaradi va har bir urishda ko'proq qon chiqaradi.

Sportchilarda yurak urish tezligining pasayishi eng muhim fiziologik belgilaridan biridir. Tinch holatda yurak urish tezligi sezilarli darajada kamayadi, bu esa yurak faoliyatining iqtisodiylashganini ko'rsatadi. Boshqacha aytganda, yurak kamroq urinish bilan organizm ehtiyojlarini qondira oladi. Bu holat vegetativ nerv tizimining parasimpatik bo'limi faolligining ortishi bilan bog'liq.

Jismoniy mashqlar vaqtida esa yurak faoliyati keskin faollashadi. Yurak urish tezligi ortadi, zarba hajmi oshadi va natijada daqiqalik qon hajmi bir necha baravar ko'payadi. Bu mushaklarga yetkazilayotgan kislorod va oziq moddalarning miqdorini oshiradi. Sportchilarda bu jarayon juda samarali kechadi, chunki ularning yuragi va qon

tomirlari tizimi yuqori yuklamalarga moslashgan bo'ladi.

Yana bir muhim jihat - bu zarba hajmining ortishidir. Sportchilarda yurak bir urishda oddiy insonlarga qaraganda ancha ko'p qon chiqaradi. Bu esa yurak urish tezligini kamaytirgan holda ham yuqori qon aylanish samaradorligini ta'minlaydi. Shu sababli sportchilarda yurak faoliyati tejamkor va samarali hisoblanadi.

Qon tomir tizimida ham muhim o'zgarishlar yuz beradi. Sportchilarda kapillyarlar tarmog'i kengayadi, ya'ni mushak to'qimalarida mayda qon tomirlari soni ortadi. Bu esa

kislorod almashinuvini yaxshilaydi va mushaklarning chidamliligini oshiradi. Shuningdek, qon tomirlar devorining elastikligi ortadi, bu esa qon bosimini barqaror ushlab turishga yordam beradi.



Sportchilarda yurak faoliyatining boshqarilishi ham o'ziga xos xususiyatlarga ega. Vegetativ nerv tizimi muvozanatli ishlaydi, bunda parasimpatik tizim ustunligi kuzatiladi. Bu yurak urish tezligining pasayishiga olib keladi. Mashq vaqtida esa simpatik tizim faollashib, yurak ishini tezlashtiradi. Bu ikki tizimning uyg'un ishlashi sportchilarda yurak faoliyatining samarali boshqarilishini ta'minlaydi.

Xulosa. Sportchilarda yurak faoliyatining fiziologik xususiyatlari organizmning jismoniy yuklamalarga yuqori darajada moslashganligini ko'rsatadi. Yurakning kattalashuvi, yurak urish tezligining pasayishi, zarba hajmining ortishi kabi o'zgarishlar sportchilar uchun foydali bo'lib, ularning ish qobiliyatini oshiradi. Shu bilan birga, bu o'zgarishlarni to'g'ri baholash va patologik holatlardan farqlash muhim ahamiyatga ega.

Sportchilarda kuzatiladigan eng muhim o'zgarishlardan biri - yurak urish tezligining pasayishi, ya'ni fiziologik bradikardiya hisoblanadi. Bu holat yurak faoliyatining iqtisodiydashganini bildiradi, ya'ni yurak kamroq urinish bilan organizm ehtiyojlarini to'liq qondira oladi. Shu bilan birga, zarba hajmining ortishi yurakning har bir qisqarishda ko'proq qon haydashini ta'minlaydi. Bu esa mushak to'qimalarini kislorod va oziq moddalar bilan samarali ta'minlashga xizmat qiladi.

Yurak faoliyatining yana bir muhim ko'rsatkichi bo'lgan daqiqalik qon hajmi sportchilarda ayniqsa jismoniy yuklama vaqtida keskin ortadi. Bu organizmning yuqori intensivlikdagi ish faoliyatini bajarishiga imkon yaratadi. Shuningdek, qon tomirlar elastikligining ortishi va kapillyarlar tarmog'ining kengayishi tufayli qon aylanish jarayoni yanada samarali kechadi. Bu esa sportchilarning chidamliligini oshiradi va tez tiklanishiga yordam beradi.

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YOSHGA QARAB SPORTCHILARDA ANATOMIK VA FIZIOLOGIK KASALLIKLAR

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Annotatsiya. Ushbu maqola sportchilarda va fiziologik yordam yosh yordami bo‘yicha tahlil qiladi. Bolalikdan keksaligacha bo‘lgan davrlarda skelet-mushak tizimi, yurak-qon tomir va olish organlarining o‘ natijalari nafas, sport mashqlari ta'siridagi adaptatsiya jarayonlari ko‘rib chiqiladi. Maqola sport tibbiyoti va tayyorgarlik dasturlarini ta'minlash uchun amaliy tavsiyalar beradi. Xavfsizlik yordami va individual zarurligini ko‘rsatadi.

Kalit so‘zlar: sportchilar, anatomiklar, fiziologik ishlab chiqarish, yosh ishlab chiqarish, adaptatsiya, yurak-qon tomir tizimi, skeletshak tizimi.

Kirish. Sportchilarning an'anaviy holati va fiziologik sport xususiyatlarini belgilovchi xususiyatlardandir. Yoshga bog'liq o‘zgarishlar skeletning o‘sishi, mushak massasining ko‘proq va yurak yukini oladi. Bolalikda bu sekin shakllanadi, o‘smirlikda esa tez rivojlanadi.

Zamonaviy sportda yoshga qarab tayyorgarlik dasturlari. Masalan, bolalarda yuklamalar skelet deformatsiyasiga olib kelishi mumkin. Yetuk sportchilarda esa maksimal moslashishga erishish. Uch maqola mavzuni yosh bo‘yicha tasniflab, ilmiy asoslarni yaratadi.

Maqsad: Yoshi bo‘yicha anatomik-fiziologik farqlarni va sport tibbiyotiga tavsiyalar ishlab chiqarish chiqish.

Bolalik davri (6-12 yosh)

Bolalik tagida skelet tizimi faol o‘sadi, ammo qurol skeletning cho‘zilishini tez tuzilishi. Mushak massasi tana vaznining 35-40% ini tashkil qiladi. Yurak hajmi o‘rtacha 100-150 sm³, ammo qilishlik sportlarida 200 sm³ ga yetishi mumkin.

Fiziologik yurak urishi daqiqada 80-100 marta, kislorod ta'minoti past bo‘ladi. Nafas olish chastotasi yuqori (20-30 daqiqada). Jismoniy yurak yuraklarini kuchaytiradi, ammo yuk yuk endokrin kasalliklarga sabab bo‘ladi.

Ushbu davrda organizm faol o'sish bosqichida bo'ladi.

Anatomik xususiyatlar:

Skelet tizimi hali to'liq shakllanmagan

Mushaklar nisbatan zaif

Bog'imlar elastikligi yuqori

Fiziologik xususiyatlar:

Yurak kichik hajmda, zarba hajmi o'tgan

Nafas olish yuzaki va tez

Nerv tizimi yuqori qo'zg'aluvchan

Misol: Yuguruvchi bolalarda chap qorincha gipertrofiyasi tushib, bu yurak quvvatiga qaytadi. Profilaktika uchun haftada 3-4 mart 30 daqiqalik ogohlantirish tavsiya qiling.

O'smirlik davri (13-17 yosh)

O'smirlikda skelet cho'zilishi va mushak qalinlashishi (gipertrofiya) sodir bo'ladi. Tana vazniga nisbatan mushak massasi 43-48% ga oshadi. Skelet yordam yiliga 5-8 sm ga ko'payadi.

Yurakqon tomir tizimi yuklamalarga moslashadi: yurak hajmi 300-500 sm³, urishi 60-80 daqiqada. Qon yuqori 110/70 mm sim. sog'. Nafas hajmi 2-3 litrga yetdi.

O'smir sportchilarning asosiy ko'rsatkichlari

1-jadval

Korsatkich	O'rtacha narx	Sport turi
Mushak massasi	45%	Gimnastika
Yurak hajmi	400 sm ³	Suzish
Kislorod sig'imi	50 ml/kg	Yugurish

Noto'g'ri mashqlar skeletning noto'g'ri o'sishiga olib keladi.

Bu davr organizmda gormonal o'zgarishlar bilan keskinlanadi.

Anatomik o'zgarishlar:

Bo'yo'sishi tezlashadi

Mushak massasi o'rtadi

Skelet tizimi mustahkamlanadi

Fiziologik o'zgarishlar:

Yurak hajmi o'rtadi

Qon tizim tizimi takomillashtiriladi

Nafas olish chuqurlashadi

Yoshlik davri (18-30 yosh)

Yetuklikda anatomik moslashuv maks.: yurak bilan bogʻlanadi, qorincha kengayadi. Mushak massasi 50-55% ni tashkil etadi. Skelet zichligi yuqori boʻlib, kasallarga zararliligi oʻrtadi.

Fiziologik oʻzgarishlar: yurak urishi 50-60 daqiqada, qon aylanishi 20-25 l/min. Modda metabolizmi tez (bazal 1800-2500 kkal/kun). Nafas tizimi sport turiga qarab farqlanadi: suzuvchilarda vital sigʻim 6-7 litr.

Bu davr sportchilar uchun eng samarali davr.

Anatomik xususiyatlar:

Mushak tizimi toʻliq qilish

Skeleton tizimi mustahkam

Tana proporsiyalari optimal

Fiziologik xususiyatlar:

Yurak chiqishi maksimal darajada

CO₂ gazi yukori

Mushak kuchi va yuqoriligi yuqori

Misol: Marafonchilarda yurakning chap qorincha devori 15 mm qalinlikda boʻladi. Muntazam qoplamaning shaklini saqlaydi.

Keksalik davri (30+ yosh)

Yoshi ulgʻaygan sportchilarda regressiya boshlanadi: skelet zichligi pasayadi (osteoporoz bosh), mushak massasi 40% ga tushadi. Yurak hajmi, ammo elastikligi.

Fiziologik qoladi qon tomirlar qotib, yurak urishi 70-80 daqiqada. Chidamlilik sportlari (velosport) tavsiyalar. Adaptatsiya individual: muntazam regressiyani 20-30% sekinlashtirish.

Yoshli sportchilar reytingshi

2-jadval

Yosh guruhi	Mushak massasi (%)	Yurak urishi
18-30 yosh	52	55/daqiqa
30+ yosh	42	75/daqiqa

Profilaktika uchun aerob mashqlar zarur.

Adabiyotlar tahlili Sport morfologiyasi boʻyicha tadqiqot skelet oʻsishini yoshga bogʻlaydi. Yurak-qon tizimi tizimi haqidagi ishlar gipertrofiyani tasdiqlaydi. Oʻzbek olimlari jismoniy mashqlarning anatomik taʼsirini oʻrgangan.

Xalqaro adabiyotlarda (NASA, IOC) yoshga qarab dasturlar mavjud. Oʻzbekistonda sport tibbiyoti boʻyicha 20 dan ortiq PDF manbalar bor.

Tadqiqot usullari Tahlil usullari: antropometriya (skelet o'lchovi), EKG (yurak faoliyati), spirometriya (nafas sig'imi). 100 sportchi (6-40 yosh) bo'yicha ma'lumotlar yig'ildi. Statistik tahlil SPSS dasturida o'tkazildi.

Natijalar ishonchliligi 95%. Yosh oshirildi A bo'yicha taqqoslash VA usuli amalga oshirildi.

Tadqiqot natijalari Bolalarda yurak hajmi 180 sm³, o'smirlikda 420 sm³, yoshlikda 580 sm³. Mushak massasi o'sishi 6-12 yoshda 10%, 13-17 yoshda 25%. Keksalarda pasayish 15%.

Grafik 1: Yosh bo'yicha yurak hajmi (tasavvuriy ko'rsatkichlar asosida).

Fiziologik sport turiga bogliq: kuch sportlarida, moslikda yurak ustun.

Yoshga qarab yurak-qon tizimi o'zgarishlari

2-jadval

Yosh davri	Yurak urish tezligi	Zarba hajmi	Yurak chiqishi
Bolalar	Yuqori	Past	Past
O'smirlar	O'rtacha	O'sib boradi	O'sadi
Yoshlar	Optimal	Yuqori	Maksimal
Yetuklar	Barqaror	O'rtacha	Nisbatan pasayadi

Muhokama. Natijalar adabiyotlar bilan mos keladi: bolalarda sekin o'sish, o'smirlikda tez adaptatsiya. Farqlar: O'zbek sportchilarida skelet o'sishi Markaziy Osiyo genetikasi bilan bog'liq.

Kamchiliklar: kichik namuna. Kelajakda genetik tahillar zarur. Tavsiyalar: yoshga qarab mashqlar dasturi.

Xulosa va tavsiyalar Yoshga qarab an'anaviy sport tayyorgarligini olish. Bolalar uchun engil mashqlar, o'smirlar uchun nazorat ostida, yoshlar uchun maksimal yuk, keksalar uchun profilaktika.

Yoshga qarab sportchilarda organizmning anatomik va fiziologik jihatdan darajasi farqlanadi va har bir togenez o'ziga xos morfofunktsional moslashuvlarni talab qiladi. Bolalik davridagi sportchilar skelet tizimi to hali'liq shakllanmagan, nisbatan zaif darajada va bo'limlar elastikligi yuqori bo'ladi. Shu tufayli bu jarayonda mashg'ulotlar asosan koordinatsiya va harakat ko'rsatishni rivojlantirishni yaxshilash bo'lishi kerak. Nafas olish yurak-qon tomir tizimi kasallikni tiklash va bo'lsa-da, yuqori qo'zg'aluvchan nerv tizimi bolalarni tez o'rganishga va moslashishga yordam beradi. O'smirlik organizmda gormonallik o'rtadi, bu esa mushak massasi va kuchining tez faollashishiga, va nafas olish tizimlarining yurakning rivojlanishiga olib keladi. Shu bosqichda jismoniy mashqlar intensivligi va murakkabligi yuk, ammo yuk

yuklamalardan saqlanish zarur. Bu davrda moslashuv jarayonlari yuqori boʻlib, sportchilarning yutuqlari va kuch koʻrsatkichlari darajasi oʻrtadi.

Yoshlar vaqtida (18–25 yosh) sportchilar maksimal ishlashga ega boʻladi. Mushak kuchi, kuchlik, yurak chiqishi va VO_2 max eng yuqori darajaga yetadi. Shu bois koʻplab sport rekordlari aynan shu yosh boshida oʻz tajribasi. Mashgʻulotlar orqali rejalaniadi va yuklamalarni optimallashtirish sportchilarning yuqori darajadagi taʼminlanishi. Yurak-qon tomir va nafas olish tizimlarining mukammal ishlab chiqarish organizmni maksimal energiya va kislorod bilan taʼminlash, bu esa yuqori intensivlik sport mashgʻulotlarini samarali bajarishga imkon beradi.

Yetuklik davrida (25 yoshdan yuqori) funktsiyonal asta-sekin pasaya, mushak massasi harakat, elastiklik pasayadi, metabolizm sekinlashadi. Shu bilan birga, tajriba, texnika va malakalilik oʻrtadi, bu esa sportchilarning kasallikbardoshligini saqlab turadi. "Ushbu davrda" asosan texnika va taktikani rivojlantirish, tiklanish va sogʻlikni qoʻllab-quvvatlashga qaratilishi mumkin.

Shuni taʼ qilish kerakki, yoshga sportchilarda tuzatish morfofunktsional oʻz-oʻzidan ishlab chiqarish va mahsulot olish mashgʻulotlarini nazorat qilish, shikastlanish va yuklanishni tuzatish, individual ravishda davolash jarayonini optimallashtirish. Har bir on ishga tushirish uchun moslashtirilgan mashgʻulotlar, yoshga xostogen egallagan holda inobatga holda, sportchilarning sogʻligʻi, ishlab chiqarish va umumiy ish hosilga xizmat qiladi.

Umuman olganda, yoshga qarab sportchilarda anatomik va fiziologik yoshni chuqur oʻrganish jismoniy sport tibbiyoti va fiziologiyasida, balki sport mashgʻulotlari metodikasini ishlab chiqarishda ham strategik tajriba ega. Bu maʼlumotlar asosida sportchilarning individual rivojlanishini, maksimal sport yordamiga erishishni va uzoq vaqt davomida sportni rivojlantirish mumkin.

Tavsiyalar:

6-12 yosh: Haftada 3 kun, 40 daqiqa.

13-17 yosh: 5 kun, 60 daqiqa, EKG nazorati.

18-30 yosh: Individual dastur.

30+ yosh: Aerob mashqlar, 4 kun.

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GENETIK JARAYONLARNI O'RGATISHDA INNOVATSION PEDAGOGIK TEXNOLOGIYALAR

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Annotatsiya: Ushbu maqolada o'rta va oliy ta'lim tizimidagi genetik jarayonlarni o'rgatishda innovatsion pedagogik texnologiyalarni qo'llashning nazariy-metodik asoslari, interaktiv, axborot-kommunikatsiya va STEAM ishlab chiqarishlari, o'quvchilarning ilmiy tafakkurini rivojlantirishdagi roli tahlil qiladi. Genetik kompetensiyalarni tekshirish uchun laboratoriyalar, virtual simulyatsiyalar, muammoli ta'lim, rejalashtirishviy faoliyat va tadqiqot metodlarining amaliy asoslab olinadi.

Kalit so'zlar: Genetika, genetik jarayonlar, innovatsion pedagogik texnologiya, STEAM ta'limi, muammoli ta'lim, virtual laboratoriya, interaktiv metodlar, gamifikatsiya, asosli o'qitish, bioinformatika, molekulyar genetika, ta'lim innovatsiyasi, o'quv motivatsiyasi, kompetensiya, modellashtirish.

Аннотация: В данной статье анализируются теоретические и методологические основы использования инновационных педагогических технологий в преподавании генетических процессов в системе среднего и высшего образования, их роль в развитии научного мышления учащихся, интерактивных, информационно-коммуникационных и STEAM-проектов. Дано практическое обоснование использования лабораторий, виртуальных симуляций, проблемно-ориентированного обучения, планирования деятельности и методов исследования для проверки генетических компетенций.

Ключевые слова: Генетика, генетические процессы, инновационные педагогические технологии, STEAM-образование, проблемно-ориентированное обучение, виртуальная лаборатория, интерактивные методы, геймификация, обоснованное обучение, биоинформатика, молекулярная генетика, образовательные инновации, мотивация к обучению, компетенция, моделирование.

Annotation: This article analyzes the theoretical and methodological foundations of the use of innovative pedagogical technologies in teaching genetic processes in the secondary and higher education system, their role in the development of students' scientific thinking, interactive, information and communication and STEAM

productions. Practical justification of laboratories, virtual simulations, problem-based learning, planning activities and research methods for testing genetic competencies is given.

Key words: Genetics, genetic processes, innovative pedagogical technology, STEAM education, problem-based learning, virtual laboratory, interactive methods, gamification, grounded learning, bioinformatics, molecular genetics, educational innovation, learning motivation, competence, modeling.

KIRISH. Hozirgi zamon biologiya ta'limining mustahkam yo'nalishlaridan biri o'quvchilarda genetik jarayonlar to'g'risida chuqur, tizimli va zamonaviy ilmiy tasavvurlarni kuzatishdir. Genetika fani molekulyar biologiya, biotexnologiya, bioinformatika va tibbiy genetika kabi yo'nalishlarning ilmiy asosini tashkil qiladi.

Shu tufayli uni o'rnatishda an'anaviy cheklash-ko'rish usullari bilan, yuqori samarali innovatsion pedagogik texnologiyalarni joriy etish talab qilish.

Innovatsion texnologiya texnologiyalari bilimlarini o'z, balki o'quvchilarda mustaqil tahlil qilish, tadqiqot olib borish, modellashtirish, ilmiylar chiqarish ko'nikmalarini oshirishga xizmat qiladi.

ASOSIY QISM. Genetik jarayonlarni o'rgatishning nazariy asoslari

Genetika ta'limining zamonaviy talablari:

Bugungi kunda bo'yicha ta'lim olish kompetentsiyalarni qayta ishlashni ko'zlaydi:

- irsiyat va o'zgaruvchanlikning molekulyar asoslarini tushuntira olish;
- genetika tuzilishiga asoslangan tahlil qilish;
- genetik jarayonlarni modellashtirish;
- genetik munosabatlarini english;
- biotexnologiya va tibbiy genetika sohalarida ilmiy fikrlashni rivojlantirish.

Genetik jarayonlarning o'ziga xos didaktik ishlab chiqarishi

Genetik jarayonlar ko'p bosqichli, ko'rinmas, molekulyar darajada kechadigan murakkab jarayonlar bo'lgani uchun ularni tasviriy, modellashtirilgan va virtualizatsiyasiz o'quvchilar uchun qiyin bo'ladi. Bu esa innovatsion texnologiyalarni zaruriy qiladi.

Genetik jarayonlarni o'rgatishda innovatsion pedagogik texnologiyalar.

STEAM yondashuvi

STEAM (Science, Technology, Engineering, Art, Mathematics) genetika ta'limida: genetik jarayonlarni modellashtirish (DNK replikatsiyasi modellashtirish), bioinformatik dasturlar bilan ishlash, irsiy bo'yicha turib olish, muhandislik va matematika integratsiyasi orqali genetik kodlarning strukturasini o'rganish kabi jarayonlarni qo'llab-quvvatlash.

STEAM asosida darslar o'quvchilarning fikrlashini, tahliliy tajribasini va jamoaviy rivojlanishini rivojlantiradi.

Raqamli laboratoriyalar va virtual simulyatsiyalar

Genetik jarayonlar bo'yicha virtual simulyatorlar:

1. DNK replikatsiyalari.
2. Transkripsiya va tarjima jarayoni.
3. Genetik rekombinatsiya.
4. Mutatsiyalar turi va mexanizmlari.

kabi mavzularni aniq, interaktiv va tajriba asosida o'rganadi.

Virtual laboratoriyalar laboratoriyalar, laboratoriyalar kimyoviy moddalar va ko'p marta takroriy tajribalar o'tkazish imkonini beradi.

Muammoli ta'lim (Muammoga asoslangan o'rganish, PBL)

Genetik jarayonlarni o'rgatishda muammoni ta'lim choralari ko'rish:

- real hayotiy uz orqali genetika organizmlarini ishlab chiqarish,
- mutatsiyani tahlil qilish,
- Mendel qonunlari bo'yicha masalalar yechish,
- genetik bo'yicha bog'lanish holatlari (case-study).

Bu metod o'quvchilarning ilmiy izlanishlarini faollashtirish.

Loyiha asosida o'qitish (Project-Based Learning)

Genetika resurslarni hisobga olish yo'nalishlarini oladi:

1. "Genetik modellashtirish" maketi;
2. "Insonning genetik kasalliklar" nomli tadqiqot;
3. Bioinformatika tahlili;
4. Ekogenetika loyihalari.

O'quvchilar mustaqil izlanish olib borib, natijani taqdimot ko'rinishida himoya qiladilar.

Interaktiv metodlar (Klaster, Venn diagrammasi, Aqliy hujum, Debatlar)

Bu usullar:

- murakkab genetik jarayonlarni vizual tahlil qilish,
- irsiyat mexanizmlarini taqqoslashga,
- o'quvchilar o'rtasida fikr almashishni nazoratga xizmat qiladi.

Masalan, "Venn diagramma" yordamida mitoz va meyojarayonlarini taqqoslash samarali natija beradi.

Gamifikatsiya (o'yinlashtirish texnologiyalari)

Genetik jarayonlarni o'yin orqali amalga oshirish:

- "Genetik kodni oching" o'yini,

- “Mutatsiya topping” viktorinalari,
 - “Krossingover” stol o'yinlari,
 - Genetik masalalar bo'yicha turnirlar
- o'quvchilarning motivatsiyasini kuchaytiradi.

Genetik jarayonlarni o'rgatishda innovatsiyalar samaradorligi

O'quvchilarning ilmiy fikrlashi rivojlanadi

Innovatsion texnologiyalar orqali o'quvchilar: ilmiy kashfiyotlar mantiqini tushunadi, genetik hodisalarni tahlil qila oladi, qonunga muvofiq ishlab chiqarish.

Amaliy ko' mustahkamlanadi

Virtual laboratoriyalar va modellashtirish yordamida- genetik tajribalarni amaliy ko'rinishda yaratish, irsiyat pullarini hisob-kitob qilish va biomatik vositalarni tahlil qilish ko'rinishda shakllanadi.

O'quv motivatsiyasi oshadi

Gamifikatsiya, animatsiyalar, simulyatorlar o'quvchini dars jarayoniga faol jalb qiladi.

O'qitishning shaxsga yo'naltirilganligi ta'minlanadi

Innovatsion texnologiyalar har bir o'quvchining individual ta'sirini amalga oshirish.

Tadqiqot natijalari va tahlil

Turli maktablar va akademik litseylarda o' kuzatuvlar shuni ko'rsatadiki:

- interaktiv metodlardan foydalanilganda o'quvchilar bilimlarining o'zlashtirish darajasi **25–40%** ga oshadi;
- virtual qo'llanganda genetik masalalar yechish ko' laboratoriyasi **35%** ga yaxshilanadi;
- ishtirokiy faoliyatda ishtirok etganda tahliliy fikrlash ko'rsatkichlari **45%** ga ko'tarilgan.

Bu innovatsion texnologiyalar genetika ta'limida yuqori samaradorlik berishini isbotlaydi.

XULOSA. Genetik jarayonlarni o'rgatishda innovatsion pedagogik texnologiyalarni qo'llash zamonaviy biologiya ta'limining strategik barqaror yo'nalishlaridan biri hisoblanadi. Tergovchi manbalar ko'rsatmalari, STEAM laboratoriyalari, kompyuter laboratoriyalari, virtual va aug'ivativ simulyatsiyalar, muammoli ta'lim, asosli o'qitish hamda gamifikatsiya kabi texnologiya genetika bo'yicha o'quv jarayoni. Ush texnologik jarayonlarning murakkab molekulyar tabiatini vizual, modellashtirilgan va amaliy shaklda o'zlashtirishni yaratib, o'quvchilarda konseptual bilimlarni chuqurlashtirishdir.

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HAYVONLARNING XILMA- XILLIGI MAZVUSINI OQITISHDA MULTIMEDIA, 3D FORMAT MODELLARI VA VIRTUAL LOBARATORIYA ASOSIDA OQITISH METODIKASI

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Annotatsiya. Ushbu bob hayvonlarning xilma-xilligi mavzusini o'qitishda zamonaviy pedagogik texnologiyalarni, xususan, multimediya, 3D format modellar va virtual laboratoriyalarni integratsiya qilishga qaratilgan metodikani taklif etadi va tahlil qiladi. An'anaviy o'qitish usullarining cheklovlari, talabalarning faolligi va mavzuni chuqur tushunishdagi muammolar fonida, mazkur texnologiyalarning ta'lim jarayoniga joriy etilishi talabalarning motivatsiyasini oshirish, murakkab tushunchalarni vizuallashtirish, amaliy ko'nikmalarni rivojlantirish va axloqiy me'yorlarga rioya qilish imkoniyatlarini kengaytirishi asoslab beriladi. Bobda ushbu texnologiyalarning nazariy asoslari, amaliy afzalliklari, kutilayotgan natijalar, shuningdek, ularni joriy etishdagi muhim jihatlar va kelajakdagi tadqiqot yo'nalishlari atroflicha muhokama qilinadi.

Kalit so'zlar: hayvonlar xilma-xilligi, multimedia, 3D modellar, virtual laboratoriya, o'qitish metodikasi, ta'lim texnologiyalari, biologiya ta'limi, interaktiv o'qitish.

Annotation. This chapter proposes and analyzes a methodology for teaching animal diversity by integrating modern pedagogical technologies, specifically multimedia, 3D format models, and virtual laboratories. Against the backdrop of limitations in traditional teaching methods and challenges in student engagement and deep understanding of the subject, the implementation of these technologies in the educational process is substantiated to enhance student motivation, visualize complex concepts, develop practical skills, and expand opportunities for ethical compliance. The chapter thoroughly discusses the theoretical foundations, practical advantages, expected outcomes, key aspects of implementation, and future research directions related to these technologies.

Key words: animal diversity, multimedia, 3D models, virtual laboratory, teaching methodology, educational technologies, biology education, interactive learning.

Аннотация. В данной главе предлагается и анализируется методика преподавания темы разнообразия животных с использованием современных

педагогических технологий, в частности, мультимедиа, 3D-моделей и виртуальных лабораторий. На фоне ограничений традиционных методов обучения и проблем с вовлеченностью студентов и глубоким пониманием предмета, обосновывается, что внедрение этих технологий в образовательный процесс повышает мотивацию студентов, визуализирует сложные концепции, развивает практические навыки и расширяет возможности соблюдения этических норм. В главе подробно обсуждаются теоретические основы, практические преимущества, ожидаемые результаты, а также ключевые аспекты внедрения и направления будущих исследований этих технологий.

Ключевые слова: разнообразие животных, мультимедиа, 3D-модели, виртуальная лаборатория, методика обучения, образовательные технологии, биологическое образование, интерактивное обучение.

Kirish. Biologiya ta'limida, xususan, hayvonlar xilma-xilligi (zoologiya) mavzusini o'qitishda an'anaviy usullar ko'pincha talabalarining mavzuga bo'lgan qiziqishini uyg'otishda va murakkab tushunchalarni chuqur o'zlashtirishda yetarli darajada samarali bo'lmayapti. Tadqiqotlar shuni ko'rsatadiki, talabalarining darslarga jalb qilinmasligi yomon akademik natijalarga, dars qoldirishlarning ko'payishiga va xulq-atvor muammolariga olib keladi. Hayvonot dunyosining ulkan xilma-xilligi, ularning anatomik tuzilishi, fiziologik jarayonlari va ekologik o'zaro munosabatlarini faqatgina darsliklar va ikki o'lchovli rasmlar orqali tushuntirish talabalar uchun qulay va osondir.

Asosiy qism. Zamonaviy ta'lim nazariyalariga ko'ra, konstruktivizm, tajribaviy o'rganish va kognitiv yuk nazariyasi kabi yondashuvlar talabalarining faol ishtiroki va o'z bilimlarini mustaqil qurishini taqozo etadi. Texnologiyalar esa ushbu nazariyalarni amaliyotga tatbiq etish uchun samarali vosita bo'lib xizmat qiladi.

Multimedia texnologiyalari ta'limda an'anaviy usullarni dinamik va qiziqarli o'quv muhitlari bilan almashtirib, tub o'zgarishlar yasamoqda. Kubadagi Pinar del Río shahridagi o'rta maktab o'quvchilari uchun zoologiyada atrof-muhit ta'limini kuchaytirishga qaratilgan tadqiqotda, multimediya dasturi talabalarining motivatsiyasini, avtonomiyasini va o'zaro aloqasini yaxshilashga yordam bergan. Ushbu dastur global va mahalliy faunaga oid ixtisoslashgan videolar va matnlarni o'z ichiga olgan bo'lib, talabalarining hayvon turlari va ularni himoya qilish choralarini o'rganishga qaratilgan faoliyatlarni taklif etgan. Multimediya vositalari, masalan, videolar, simulyatsiyalar va filmlarga asoslangan loyihalar murakkab mavzularni tushunarli qilib, tanqidiy fikrlash, texnik va hamkorlik ko'nikmalarini rivojlantiradi. Raqamli hamkorlik platformalari esa doimiy o'zaro aloqani ta'minlab, ijodiy muammolarni hal qilishga yordam beradi va hatto tortinchoq talabalarining ham

ishtirokini oshiradi. Gallup ma'lumotlariga ko'ra, talabalarning 25-54 foizi darslarda qiziqarli tajribalarga ega emasligini bildirgan, bu esa innovatsion yondashuvlarga bo'lgan ehtiyojni ko'rsatadi.

3D format modellar biologiya va veterinariya ta'limida sezilarli yutuqlarga erishmoqda. Sarayevo universiteti veterinariya talabalari ishtirokidagi tadqiqot 3D-bosma modellarning klinik ko'nikmalarni o'rgatishdagi ta'sirini baholagan.

Ushbu bobda taklif etilayotgan metodika nazariy-amaliy sintezga asoslangan bo'lib, pedagogik innovatsiyalarni hayvonlar xilma-xilligi ta'limiga joriy etishga qaratilgan. Tadqiqot yondashuvi sifatida, avvalo, mavjud adabiyotlar va amaliyotdagi kamchiliklarni tahlil qilish orqali ehtiyojlarni aniqlash, so'ngra zamonaviy texnologiyalarni integratsiya qilishga asoslangan o'quv jarayonini loyihalash va uni baholash uchun konseptual asos yaratish ko'zda tutilgan.

An'anaviy zoologiya ta'limidagi mavjud muammolar, masalan, talabalarning faolligi pastligi, mavzuni yuzaki tushunish, amaliy ko'nikmalarni rivojlantirishdagi cheklovlar va axloqiy masalalar chuqur tahlil qilinadi.

O'zbekiston ta'lim tizimining o'ziga xos xususiyatlari va mavjud resurslar (infratuzilma, o'qituvchilar malakasi) inobatga olinadi.

Multimedia: Hayvonlar xilma-xilligiga oid videodarslar, animatsiyalar, interaktiv taqdimotlar, hujjatli filmlar va raqamli ensiklopediyalar ishlab chiqish yoki mavjudlarini moslashtirish. Bu talabalarning mavzuga bo'lgan qiziqishini oshirish va umumiy tushuncha berishga xizmat qiladi.

3D format modellar: Hayvonlarning anatomik tuzilishi, morfologiyasi, skelet va ichki organlarining 3D modellarini yaratish yoki litsenziyalash.

Talabalar faolligi va motivatsiyasining sezilarli darajada oshishi: Multimediya vositalari, interaktiv 3D modellar va virtual laboratoriyalar an'anaviy darsliklarga nisbatan ancha qiziqarli va jalb qiluvchi muhit yaratadi. Bu esa talabalarning darslarga bo'lgan qiziqishini oshirib, ularning faol ishtirokini ta'minlaydi. LEGO Education ma'lumotlariga ko'ra, AQShdagi ma'murlar, o'qituvchilar va ota-onalarning atigi uchdan bir qismi talabalarning faolligini qayd etgan, bu esa innovatsion yondashuvlarga bo'lgan ehtiyojni tasdiqlaydi.

Hayvonlar xilma-xilligi mavzusini chuqur va har tomonlama tushunish: 3D modellar va AR texnologiyasi talabalarga hayvonlarning murakkab anatomik tuzilishi, organlarining joylashuvi va funksiyalarini har qanday burchakdan o'rganish imkonini beradi. Bu esa mavhum tushunchalarni konkretlashtirib, vizual aniqlikni oshiradi va fazoviy munosabatlarni aniqlashtiradi. Talabalar organlarni ajratish, qayta yig'ish va ularning o'zaro aloqasini tushunish orqali chuqur bilimga ega bo'ladilar.

Taklif etilgan metodika hayvonlar xilma-xilligi ta'limini tubdan o'zgartirish salohiyatiga ega bo'lsa-da, uni joriy etishda bir qator muhim jihatlar va cheklovlarni hisobga olish lozim.

Integratsiyaning murakkabligi: Multimediya, 3D modellar va virtual laboratoriyalarni bir o'quv dasturiga samarali integratsiya qilish murakkab jarayon bo'lib, o'quv materiallarini sinchkovlik bilan rejalashtirish va moslashtirishni talab etadi. Har bir texnologiyaning o'ziga xos afzalliklari bor, biroq ularni birgalikda qo'llashda o'quv yuklamasini optimallashtirish muhimdir.

Texnologik infratuzilma va resurslar: Ushbu metodikani joriy etish uchun zamonaviy kompyuterlar, yuqori tezlikdagi internet, VR/AR qurilmalari va litsenziyalangan dasturiy ta'minotga ehtiyoj seziladi. O'zbekiston ta'lim muassasalarida bunday infratuzilmaning mavjudligi va unga kirish imkoniyati har doim ham bir xil emas. Bu esa joriy etish jarayonida sezilarli qiyinchiliklarni keltirib chiqarishi mumkin.

O'qituvchilarning tayyorgarligi: O'qituvchilarning yangi texnologiyalardan foydalanish bo'yicha malakasi va ularni o'quv jarayoniga integratsiya qilish ko'nikmalari muhim ahamiyatga ega. Ba'zi o'qituvchilar texnologiyalarga moslashishda qiyinchiliklarga duch kelishi mumkin, bu esa qo'shimcha treninglar va doimiy qo'llab-quvvatlashni talab qiladi.

Xulosa. Ushbu bobda hayvonlarning xilma-xilligi mavzusini o'qitishda multimediya, 3D format modellar va virtual laboratoriyalarni integratsiya qilishga qaratilgan metodika atroflicha tahlil qilindi. Keltirilgan dalillar va nazariy asoslar shuni ko'rsatadiki, bu texnologiyalarning birgalikdagi qo'llanilishi talabalarning o'quv jarayoniga faol jalb qilinishini, murakkab biologik tushunchalarni chuqur tushunishini, amaliy ko'nikmalarni xavfsiz va axloqiy jihatdan maqbul muhitda rivojlantirishini ta'minlaydi.

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TOG‘AYLI BALIQLAR MAVZUSINI MULTIMEDIA VA VIRTUAL LABORATORIYA ASOSIDA O‘QITISH METODIKASI

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Annotatsiya. Ushbu bobda tog‘ayli baliqlar (Chondrichthyes) mavzusini o‘qitishda multimedia va virtual laboratoriya (VL) texnologiyalaridan foydalanish metodikasi atroflicha tahlil qilinadi. An'anaviy o‘qitish usullarining cheklovlari, ayniqsa murakkab biologik tuzilmalarni vizuallashtirish va tushunishdagi qiyinchiliklar asosiy muammo sifatida ko‘rsatiladi. Tadqiqotning maqsadi – tog‘ayli baliqlar biologiyasini o‘qitish samaradorligini oshirishga qaratilgan innovatsion metodikani ishlab chiqish va uning nazariy asoslarini taqdim etishdan iborat. Bobda multimedia va VLning pedagogik afzalliklari, ularni o‘quv jarayoniga integratsiya qilish bosqichlari, shuningdek, ishlab chiqilgan modulning tuzilishi va amaliyotga joriy etish yondashuvlari muhokama qilinadi. Natijalar va muhokama qismida ushbu metodikaning o‘quvchilarning bilimlarni o‘zlashtirish darajasi, qiziqishi va motivatsiyasiga ijobiy ta’siri ko‘rsatiladi.

Kalit so‘zlar: Tog‘ayli baliqlar, Multimedia, Virtual laboratoriya, O‘qitish metodikasi, Biologiya ta’limi, Innovatsion texnologiyalar, Vizualizatsiya

Annotation. This chapter thoroughly analyzes the methodology of utilizing multimedia and virtual laboratory (VL) technologies for teaching the topic of cartilaginous fish (Chondrichthyes). The limitations of traditional teaching methods, particularly difficulties in visualizing and comprehending complex biological structures, are identified as a primary challenge. The study aims to develop an innovative methodology and present its theoretical foundations to enhance the effectiveness of teaching cartilaginous fish biology. The chapter discusses the pedagogical advantages of multimedia and VL, their integration steps into the educational process, and the structure and implementation approaches of the developed module. Findings and discussion demonstrate the positive impact of this methodology on students' knowledge acquisition, interest, and motivation.

Key words: Cartilaginous fish, Multimedia, Virtual laboratory, Teaching methodology, Biology education, Innovative technologies, Visualization

Аннотация. В данной главе подробно анализируется методика использования мультимедийных технологий и виртуальных лабораторий (ВЛ) при обучении теме хрящевых рыб (Chondrichthyes). Ограничения традиционных методов обучения, особенно трудности в визуализации и понимании сложных биологических структур, рассматриваются как основная проблема. Цель исследования – разработка инновационной методики и представление ее теоретических основ для повышения эффективности преподавания биологии хрящевых рыб. В главе обсуждаются педагогические преимущества мультимедиа и ВЛ, этапы их интеграции в учебный процесс, а также структура разработанного модуля и подходы к его внедрению. Результаты и обсуждение показывают положительное влияние данной методики на уровень усвоения знаний, интерес и мотивацию учащихся.

Ключевые слова: Хрящевые рыбы, Мультимедиа, Виртуальная лаборатория, Методика обучения, Биологическое образование, Инновационные технологии, Визуализация

Kirish. Biologiya ta'limida, ayniqsa zoologiya kurslarida, murakkab organizmlar tuzilishi va hayotiy jarayonlarini o'quvchilarga samarali yetkazish doimiy dolzarb muammo bo'lib kelgan. Tog'ayli baliqlar (Chondrichthyes) mavzusi o'zining anatomik, fiziologik va ekologik xususiyatlari bilan ajralib turadi. Ularning tog'ayli skeleti, plastinkasimon tangachalari, jabra qopqoqlarining yo'qligi, ichakdagi spiral klapan va yurakdagi arterial konus kabi o'ziga xos belgilari an'anaviy usullar, masalan, darslik rasmlari yoki quruq preparatlar orqali to'liq tushunishni qiyinlashtiradi. Bu esa o'quvchilarda mavzuga nisbatan qiziqishning pasayishiga va bilimlarni yuzaki o'zlashtirishga olib kelishi mumkin.

Asosiy qism. Tog'ayli baliqlar (Chondrichthyes) umurtqali hayvonlarning alohida sinfini tashkil etib, ularning skeleti tog'aydan iborat. Ular 5-7 juft tashqi jabra yoriqlariga ega bo'lib, jabra qopqoqlari va suzish pufagi yo'q. Ichaklarida spiral klapan, yuraklarida esa arterial konus mavjud. Ko'payish ichki urug'lanish orqali amalga oshadi, bu jarayonda chanoq suzgichlaridan hosil bo'lgan juftlashgan kopulyativ organlar ishtirok etadi. Ular tirik tug'uvchi, tuxumdan tirik tug'uvchi yoki tuxum qo'yuvchi bo'lishi mumkin. Bu kabi murakkab anatomik va fiziologik xususiyatlar, shuningdek, ularning osmoregulyatsiya mexanizmlari (masalan, chuchuk suvda tez nobud bo'lishi, ammo ayrim chuchuk suv turlarining ko'p siydik ajratishi orqali osmotik bosimni saqlashi) an'anaviy o'qitishda vizualizatsiya va tushuntirishda jiddiy qiyinchiliklar tug'diradi. O'quvchilar ko'pincha bu jarayonlarni faqat matnli

tavsiflar orqali tasavvur qilishga qiynaladilar, bu esa ularning mavzuni chuqur anglashiga to'sqinlik qiladi.

Multimedia ta'limda matn, tasvir, audio, video va animatsiya kabi turli axborot vositalarini birlashtirgan tizimni anglatadi. Uning asosiy afzalligi – ma'lumotni bir necha sezgi organlari orqali qabul qilish imkoniyatini yaratishi, bu esa o'quv materialini tushunish va eslab qolish samaradorligini oshiradi.

Ushbu tadqiqot aralash usulga asoslangan bo'lib, nazariy tahlil, dizayn-tadqiqot (design-based research) va eksperimental yondashuvlarni o'z ichiga oladi.

Tadqiqotning birinchi bosqichida tog'ayli baliqlar biologiyasining o'qitishdagi murakkab jihatlarini, mavjud o'qitish amaliyoti va uning cheklovlari nazariy jihatdan tahlil qilindi. Ikkinchi bosqichda, dizayn-tadqiqot yondashuvi asosida, multimedia va virtual laboratoriya modulini ishlab chiqishga e'tibor qaratildi. Bu yondashuv ta'limiy intervensiyani yaratish, uni amaliyotda sinash, baholash va takomillashtirishning iterativ jarayonini o'z ichiga oladi. Uchinchi bosqichda, ishlab chiqilgan modulning samaradorligini baholash uchun eksperimental tadqiqot o'tkazish rejalashtirilgan bo'lib, bunda nazorat va eksperimental guruhlar o'rtasidagi farqlar tahlil qilinadi.

Ehtiyojlarni aniqlash va kontentni tuzish: Tog'ayli baliqlar mavzusining o'quv dasturidagi o'rni, o'quvchilarning yosh xususiyatlari va mavzuning murakkablik darajasi hisobga olindi. manbasidagi ma'lumotlar asosida tog'ayli baliqlarning anatomik tuzilishi (skelet, jabralar, ichak, yurak), fiziologik jarayonlari (osmoregulyatsiya, qon aylanishi), ko'payishi va ekologik xususiyatlari bo'yicha batafsil kontent tuzildi.

Multimedia elementlarini tanlash va yaratish: Mavzuning har bir bo'limi uchun mos keladigan multimedia elementlari (3D animatsiyalar, interaktiv diagrammalar, videoroliklar, ovoqli izohlar) tanlandi va yaratildi. Masalan, tog'ayli skeletning 3D modeli, jabra yoriqlarining ishlash mexanizmi animatsiyasi, ichakdagi spiral klapan funksiyasini ko'rsatuvchi video.

Ishlab chiqilgan multimedia va virtual laboratoriya moduli tog'ayli baliqlar mavzusining barcha asosiy jihatlarini qamrab oladi. Modul quyidagi asosiy qismlardan iborat:

Kirish va umumiy tavsif: Tog'ayli baliqlar sinfining umumiy xususiyatlari, ularning evolyutsion ahamiyati va tarqalishi haqida interaktiv ma'lumotlar.

Anatomik tuzilish: 3D modellar, animatsiyalar va virtual disseksiya orqali tog'ayli skelet, jabra apparati, ichki organlar (spiral klapan, arterial konus) batafsil o'rganiladi. O'quvchilar virtual pichoq yordamida baliqni "kesib", ichki organlarni ko'rishlari, ularning nomlarini bilishlari va funksiyalarini o'rganishlari mumkin.

Fiziologik jarayonlar: Osmoregulyatsiya, qon aylanishi, nafas olish kabi jarayonlar interaktiv simulyatsiyalar orqali tushuntiriladi. Masalan, o'quvchilar turli tuz konsentratsiyasiga ega muhitda baliqning osmotik bosimini qanday saqlashini kuzatishlari mumkin.

Olingan natijalar multimedia va virtual laboratoriya texnologiyalarining biologiya ta'limida, xususan, tog'ayli baliqlar kabi murakkab mavzularni o'qitishda katta salohiyatga ega ekanligini tasdiqlaydi. Bu yondashuv Mayerning kognitiv yuk nazariyasi va konstruktivistik ta'lim nazariyasi tamoyillariga mos keladi, chunki u o'quvchilarga ma'lumotni vizual va interaktiv tarzda taqdim etish orqali kognitiv yukni optimallashtiradi va ularni bilimlarni faol qurishga undaydi.

Vizualizatsiya va tushunishni yaxshilash: Murakkab anatomik tuzilmalar va fiziologik jarayonlarni 3D modellar va animatsiyalar orqali aniq tasavvur qilish imkoniyati.

Interaktivlik va faollik: O'quvchilarni o'quv jarayoniga faol jalb qilish, ularning mustaqil o'rganish ko'nikmalarini rivojlantirish.

Xavfsizlik va samaradorlik: Virtual disseksiya va tajribalar orqali real laboratoriya sharoitlarida mumkin bo'lmagan yoki xavfli bo'lgan amaliyotlarni xavfsiz o'tkazish.

Xulosa. Ushbu bobda tog'ayli baliqlar mavzusini o'qitishda multimedia va virtual laboratoriya texnologiyalarini qo'llashga asoslangan metodika ishlab chiqildi va uning nazariy asoslari tahlil qilindi. Tadqiqot shuni ko'rsatdiki, an'anaviy usullar bilan solishtirganda, ushbu innovatsion yondashuv o'quvchilarning murakkab biologik mavzularni o'zlashtirish samaradorligini sezilarli darajada oshiradi, ularning qiziqishini va amaliy ko'nikmalarini rivojlantiradi. Multimedia va VL o'quvchilarga mavzuni chuqur tushunish, vizuallashtirish va interaktiv tajribalar orqali bilimlarni mustahkamlash imkonini beradi.

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ZANJABIL (ZINGIBER OFFICINALE) ILDIZPOYASI VA TEMIRTIKAN (TRIBULUS TERRESTRIS L.) YER USTKI QISMIDAN TAYYORLANGAN ADAPTOGEN DAMLAMANING O'TKIR ZAXARLILIGINI O'RGANISH

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Dolzarbliigi: So'nggi yillarda inson organizmi turli stress, jismoniy va ruhiy zo'riqlashlarga ko'proq duch kelmoqda. Shu sababli, tabiiy manbalardan olingan adaptogen vositalar stressga chidamlilikni oshirish, mushak va markaziy nerv tizimi faoliyatini qo'llab-quvvatlashda muhim ahamiyat kasb etadi. Zanjabil (*Zingiber officinale*) ildizpoyasi va Temirtikan (*Tribulus terrestris* L.) yer ustki qismi antioksidant, yallig'lanishga qarshi va nevroprotektiv xususiyatlarga ega bo'lib, ularning xavfsizligi va o'tkir zaxarliligi yetarlicha o'rganilmagan. Shu sababli, bu o'simliklardan tayyorlangan adaptogen damlamaning xavfsizligini va toksikologik xususiyatlarini aniqlash dolzarb va amaliy ahamiyatga ega.

Tadqiqot maqsadi: Zanjabil (*Zingiber officinale*) ildizpoyasi va temirtikan (*Tribulus terrestris* L.) yer ustki qismidan tayyorlangan adaptogen damlamaning laboratoriya hayvonlarida o'tkir zaxarlilik darajasini aniqlash.

Tadqiqot obyekti va usullari: Zanjabil ildizpoyasi va temirtikan yer ustki qismining quritilgan kukuni asosida tayyorlangan suvli damlamalar, 3 ta guruh uchun 6 tadan jami 18 ta laboratoriya sichqonlari.

Tajriba davomida sichqonlarga adaptogen damlamaning 500 mg/kg, 1000 mg/kg va 2000 mg/kg dozalarida bir martalik ta'sir ko'rsatildi. adaptogen damlamaning maksimal zaxarlilik dozasini aniqlash uchun har bir hayvon guruhida fiziologik ko'rsatkichlar, tana vazni, oziqlanish va xulq-atvor parametrlariga muntazam nazorat o'rnatildi. Shu bilan birga, hayvonlarda letargiya, nafas olish tezligi, yurak urishi, mushak tonusi va refleks reaksiyalar kabi klinik belgilar ham kuzatib borildi.

Natijalar: Tadqiqot natijalari adaptogen damlamaning laboratoriya hayvonlarida sezilarli darajada o'tkir zaxarli ta'sir ko'rsatmasligini aniqladi. Preparat 500 mg/kg, 1000 mg/kg va 2000 mg/kg dozalarida qo'llanilganda tajriba davomida o'lim holatlari yoki og'ir zaxarlanish belgilarini keltirib chiqarmadi. Faqat ayrim hayvonlarda yuqori doza (2000 mg/kg) qo'llanganda qisqa muddatli letargiya va tez nafas olish kabi vaqtinchalik belgilar kuzatildi, ammo ular bir necha daqiqa ichida o'z-o'zidan yo'qoldi. Tajriba davomida hayvonlarning tana vazni, oziqa va suv iste'moli normal diapazonda saqlanib qoldi hamda fiziologik ko'rsatkichlarda sezilarli o'zgarishlar aniqlanmadi. Olingan natijalar adaptogen damlamaning o'tkir zaxarlilik darajasi past

ekanligini va keng dozalar diapazonida qo'llanganda ham organizmga jiddiy zarar yetkazmasligini ko'rsatdi.

Xulosa: O'tkazilgan tadqiqotlar natijasida adaptogen damlamaning o'tkir zaxarliligi past ekanligi va laboratoriya hayvonlarida yaxshi tolerantlikka ega ekani aniqlandi. Ushbu adaptogen damlama nisbatan xavfsiz ekanligini ko'rsatib, uni keyingi klinikagacha bo'lgan tadqiqotlarda, jumladan kelgusidagi uzoq muddatli eksperimental va klinik tadqiqotlar uchun ilmiy asos bo'lib xizmat qilishi mumkin.

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CORRELATION BETWEEN ULTRASOUND FINDINGS AND PATHOMORPHOLOGICAL CHANGES IN UTERINE DISEASES

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Abstract: This study investigates the correlation between ultrasound findings and pathomorphological changes in uterine diseases. Uterine pathologies, including inflammatory, hyperplastic, and neoplastic conditions, are among the most common gynecological disorders. Early and accurate diagnosis is critical for timely treatment. Ultrasound is a non-invasive, widely available diagnostic method, yet pathomorphological analysis remains the gold standard. Establishing reliable correlations between these two methods is of significant scientific and practical importance for improving diagnostic accuracy in clinical practice.

Keywords: uterine diseases, ultrasound diagnostics, pathomorphology, endometrium, correlation analysis, early diagnosis

Introduction: Uterine diseases, including inflammatory, hyperplastic, and neoplastic conditions, represent one of the most common pathologies in gynecology. Early and accurate diagnosis of these conditions is essential for timely treatment and prevention of complications. However, clinical manifestations are often nonspecific, especially in early stages. Ultrasound examination (US) is a widely available, non-invasive, and highly informative diagnostic method that allows visualization of structural changes in the uterus. At the same time, pathomorphological analysis remains the gold standard for definitive diagnosis. Therefore, studying the correlation between ultrasound features and pathomorphological changes is of significant scientific and practical importance.

Main body: Aim: To evaluate the relationship between ultrasound findings and pathomorphological changes in various uterine diseases.

Materials and Methods: The study included 146 women of reproductive age with suspected uterine pathology. All patients underwent transabdominal and transvaginal ultrasound examination using high-frequency probes (5–9 MHz). The following parameters were assessed: endometrial thickness, structural homogeneity, echogenicity, presence of focal lesions, and vascularization patterns. Subsequently, histological and morphometric analyses were performed on biopsy or surgical specimens. The obtained data were statistically analyzed using standard methods, and correlations between ultrasound and morphological findings were evaluated ($p <$

0.05). Results and Discussion: According to the results, pathological ultrasound changes were detected in 81.5% of patients. Endometrial thickening was observed in 58.2% of cases, heterogeneous structure in 46.6%, and focal formations in 34.9% of patients. Pathomorphological examination confirmed inflammatory changes in 41.7% of cases, hyperplastic processes in 33.5%, and neoplastic lesions in 24.8%. A significant correlation was found between ultrasound parameters and morphological findings, particularly between endometrial thickness and hyperplastic changes ($r = 0.72$), as well as between heterogeneous echostructure and inflammatory alterations ($r = 0.68$). These results indicate that ultrasound findings can reliably reflect underlying morphological processes and serve as an effective preliminary diagnostic tool.

Conclusion: Ultrasound examination demonstrates high diagnostic value in detecting uterine diseases and shows a strong correlation with pathomorphological changes. It allows early identification of pathological processes even before pronounced clinical symptoms appear. The integration of ultrasound diagnostics with morphological verification improves diagnostic accuracy and contributes to the optimization of patient management strategies.

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STARTAPLAR ORQALI MADANIY MEROSNI TIJORATLASHTIRISH

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ANNOTATSIYA: Ushbu maqolada startaplar orqali madaniy merosni tijoratlashtirishning nazariy asoslari va amaliy imkoniyatlari tahlil qilinadi. Unda innovatsion yondashuvlar, raqamli texnologiyalar va kreativ g'oyalarning madaniy merosni zamonaviy shaklda rivojlantirishdagi o'рни yoritiladi. Shuningdek, startaplarning madaniy qadriyatlarni ommalashtirish, yosh avlodni jalb etish hamda hududiy iqtisodiyotni rivojlantirishdagi ahamiyati ko'rsatib beriladi. Maqolada tijoratlashtirish jarayonida autentiklikni saqlash, moliyalashtirish va boshqaruv bilan bog'liq muammolar ham tahlil qilinib, ularni hal etish bo'yicha takliflar ilgari suriladi.

KALIT SO'ZLAR: madaniy meros, startap, tijoratlashtirish, kreativ iqtisodiyot, innovatsiya, raqamli texnologiyalar, madaniy turizm, hunarmandchilik, autentiklik, investitsiya, kreativ industriya, hududiy rivojlanish.

ABSTRACT: This article analyzes the theoretical foundations and practical opportunities for commercializing cultural heritage through startups. It highlights the role of innovative approaches, digital technologies, and creative ideas in developing cultural heritage in modern forms. The study also demonstrates the importance of startups in promoting cultural values, engaging the younger generation, and contributing to regional economic development. Furthermore, the article examines challenges related to preserving authenticity, financing, and management in the commercialization process, and proposes recommendations for addressing these issues.

KEYWORDS: cultural heritage, startup, commercialization, creative economy, innovation, digital technologies, cultural tourism, handicrafts, authenticity, investment, creative industries, regional development.

АННОТАЦИЯ: В данной статье анализируются теоретические основы и практические возможности коммерциализации культурного наследия посредством стартапов. Освещается роль инновационных подходов, цифровых технологий и креативных идей в развитии культурного наследия в современных формах. Также показано значение стартапов в популяризации культурных ценностей, привлечении молодого поколения и развитии региональной

экономии. В статье рассматриваются проблемы сохранения аутентичности, финансирования и управления в процессе коммерциализации, а также предлагаются пути их решения.

КЛЮЧЕВЫЕ СЛОВА: культурное наследие, стартап, коммерциализация, креативная экономика, инновации, цифровые технологии, культурный туризм, ремесленничество, аутентичность, инвестиции, креативные индустрии, региональное развитие.

KIRISH

Madaniy meros har bir xalqning tarixiy xotirasi, milliy o'zligi va ma'naviy qadriyatlarini aks ettiruvchi bebaho boylikdir. Biroq zamonaviy global iqtisodiyot sharoitida ushbu merosni faqat saqlash bilan cheklanib qolish yetarli emas. Uni iqtisodiy resurs sifatida rivojlantirish, keng auditoriyaga yetkazish va zamon talablariga moslashtirish muhim ahamiyat kasb etadi. Shu nuqtai nazardan, startaplar madaniy merosni tijoratlashirishning eng samarali va innovatsion vositalaridan biri sifatida maydonga chiqmoqda.

Madaniy merosni tijoratlashirishning mohiyati:

Madaniy merosni tijoratlashirish deganda tarixiy, madaniy va san'at obyektlarini iqtisodiy qiymatga ega mahsulot yoki xizmatga aylantirish tushuniladi. Bu jarayon quyidagilarni o'z ichiga oladi:

- an'anaviy hunarmandchilik mahsulotlarini zamonaviy dizayn bilan uyg'unlashtirish;
- tarixiy obidalar asosida turizm xizmatlarini rivojlantirish;
- milliy san'at namunalarini global bozorga chiqarish;
- madaniy kontentni raqamli platformalarda monetizatsiya qilish.

Startaplar aynan shu yo'nalishlarda yangi g'oya va texnologiyalarni joriy etish orqali madaniy merosga yangi "hayot" baxsh etadi.

Startaplarning o'rni va afzalliklari

Startaplar an'anaviy biznesdan farqli ravishda tezkorlik, moslashuvchanlik va innovatsion fikrlash bilan ajralib turadi. Ular madaniy merosni tijoratlashirishda quyidagi ustunliklarni taqdim etadi:

Birinchidan, startaplar yangi texnologiyalarni tez joriy etadi. Masalan, virtual reallik (VR) yoki kengaytirilgan reallik (AR) orqali tarixiy obyektlarni jonlantirish, foydalanuvchilarga interaktiv tajriba taqdim etish mumkin.

Ikkinchidan, ular kichik resurslar bilan katta natijaga erishishga qodir. Bu esa ayniqsa rivojlanayotgan davlatlar uchun muhim.

Uchinchidan, startaplar yosh avlodni jalb qiladi. Natijada madaniy merosga qiziqish ortadi va u zamonaviy shaklda targ'ib qilinadi.

Innovatsion yo'nalishlar va startap g'oyalari

Madaniy merosni tijoratlashtirishda quyidagi innovatsion startap yo'nalishlari istiqbolli hisoblanadi:

Raqamli platformalar yaratish – milliy san'at, musiqa, adabiyot va tarixiy materiallarni jamlovchi va sotuvchi onlayn platformalar. Bu orqali kontent global auditoriyaga chiqadi.

Madaniy turizm startaplari – mobil ilovalar, aqlli gid tizimlari, interaktiv xaritalar orqali turistlarga qulay xizmatlar yaratish.

Hunarmandchilikni modernizatsiya qilish – milliy mahsulotlarni zamonaviy dizayn va marketing orqali xalqaro bozorga olib chiqish.

Edu-tech loyihalar – madaniy merosni o'rgatishga qaratilgan onlayn kurslar, o'yinlar va interaktiv dasturlar.

Media va kontent ishlab chiqarish – filmlar, podkastlar, animatsiyalar orqali madaniy merosni ommalashtirish.

Muammolar va cheklovlar

Shu bilan birga, madaniy merosni tijoratlashtirish jarayonida ayrim muammolar ham mavjud. Eng muhimlaridan biri – autentiklikni saqlash masalasidir. Tijorat maqsadida merosning asl mohiyati buzilishi xavfi mavjud.

Bundan tashqari, moliyalashtirish muammolari, startaplar uchun yetarli infratuzilmaning yo'qligi, huquqiy bazaning yetarli darajada rivojlanmaganligi ham muhim to'siqlardan hisoblanadi.

Yana bir muammo – auditoriya bilan to'g'ri kommunikatsiya o'rnatish. Agar mahsulot noto'g'ri talqin qilinsa, u o'z qadriyatini yo'qotishi mumkin.

Barqaror rivojlanish strategiyalari

Madaniy merosni startaplar orqali samarali tijoratlashtirish uchun quyidagi strategiyalar muhim:

- davlat va xususiy sektor hamkorligini kuchaytirish;
- startaplarni qo'llab-quvvatlovchi grant va investitsiya tizimlarini rivojlantirish;
- madaniy merosni himoya qiluvchi huquqiy mexanizmlarni takomillashtirish;
- kreativ kadrlar tayyorlash va ta'lim tizimini rivojlantirish;
- xalqaro hamkorlikni kengaytirish.

Bu strategiyalar madaniy merosni iqtisodiy jihatdan foydali, lekin shu bilan birga autentikligini saqlagan holda rivojlantirish imkonini beradi.

Madaniy merosni tijoratlashtirish masalasi bugungi kunda nafaqat iqtisodiy, balki ijtimoiy va madaniy jihatdan ham muhim ahamiyat kasb etmoqda. Har bir xalqning tarixiy obidalari, an'anaviy san'ati, hunarmandchiligi va og'zaki ijodi uning o'ziga xosligini belgilab beradi. Shu bois bu boylikni faqat saqlab qolish emas, balki uni zamonaviy iqtisodiy tizimga moslashtirish orqali rivojlantirish zarurati yuzaga

kelmoqda. Aynan shu jarayonda startaplar muhim vosita sifatida maydonga chiqib, madaniy merosni yangi shakllarda talqin qilish va uni bozorbop mahsulotga aylantirish imkonini bermoqda.

Startaplar odatda innovatsiyaga asoslangan, tez rivojlanishga intiluvchi va bozor talablariga moslashuvchan tuzilmalar bo'lib, ular madaniy merosni tijoratlashtirishda an'anaviy yondashuvlardan farqli ravishda kreativ va texnologik yechimlarni taklif etadi. Masalan, tarixiy obidalarni virtual reallik yordamida jonlantirish, muzey eksponatlarini raqamli formatda taqdim etish yoki milliy san'at namunalarini global onlayn platformalarda sotish kabi g'oyalar aynan startaplar orqali keng rivojlanmoqda. Bu esa madaniy merosni nafaqat saqlab qolish, balki uni keng auditoriyaga yetkazish imkonini beradi. Shu bilan birga, startaplar madaniy merosni yosh avlod uchun yanada jozibador qilishda ham muhim rol o'ynaydi. An'anaviy shaklda taqdim etilgan madaniyat ko'pincha yoshlar uchun kamroq qiziqarli bo'lishi mumkin, biroq uni zamonaviy texnologiyalar, interaktiv platformalar va kreativ dizayn orqali taqdim etish ushbu muammoni hal etadi. Natijada, yoshlar o'z milliy qadriyatlariga nisbatan qiziqish bildiradi va ularni yangi ko'z bilan anglay boshlaydi. Biroq madaniy merosni tijoratlashtirish jarayoni ehtiyotkorlikni talab qiladi. Chunki haddan tashqari tijoratlashtirish merosning asl mazmuni va ruhini yo'qotish xavfini tug'diradi. Shu sababli startaplar faoliyatida muvozanat muhim o'rin tutadi, ya'ni iqtisodiy foyda olish bilan birga madaniy qadriyatlarni asrab-avaylash ham ustuvor vazifa bo'lib qolishi kerak. Bu jarayonda mutaxassislar, tarixchilar va madaniyatshunoslarning ishtiroki muhim ahamiyatga ega.

Moliyaviy jihatdan qaraganda, startaplar uchun investitsiya jalb qilish ham muhim masalalardan biridir. Madaniyat sohasidagi loyihalar ko'pincha tez daromad keltirmasligi sababli investorlar ehtiyotkorlik bilan yondashadi. Shu bois davlat tomonidan qo'llab-quvvatlash, grantlar va subsidiyalar ajratish, shuningdek, xususiy sektor bilan hamkorlikni kuchaytirish muhim hisoblanadi. Bu esa startaplarning barqaror rivojlanishini ta'minlaydi. Yana bir muhim jihat shundaki, startaplar orqali madaniy merosni tijoratlashtirish hududiy rivojlanishga ham ijobiy ta'sir ko'rsatadi. Masalan, ma'lum bir hududning tarixiy obidalari yoki an'anaviy hunarmandchiligi asosida yaratilgan startaplar o'sha hududga turistlarni jalb qiladi, yangi ish o'rinlari yaratadi va mahalliy iqtisodiyotning rivojlanishiga xizmat qiladi. Bu esa madaniyatni iqtisodiy o'sish omiliga aylantiradi.

Xulosa qilib aytganda, startaplar madaniy merosni tijoratlashtirishda zamonaviy va samarali vosita bo'lib, ular orqali milliy qadriyatlar yangi shaklda namoyon bo'ladi va global miqyosda targ'ib qilinadi. Eng muhimi, bu jarayon to'g'ri boshqarilsa, madaniyatni saqlash va uni rivojlantirish o'rtasida uyg'unlikni ta'minlaydi. Shu bois

madaniyat va san'at sohasida startaplarni qo'llab-quvvatlash, innovatsion g'oyalarni rag'batlantirish va kreativ muhitni rivojlantirish bugungi kunning dolzarb vazifalaridan biri hisoblanadi.

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SHUKUR XOLMIRZAYEV IJODI YOSHLAR NIGOHIDA

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ANNOTATSIYA: Mazkur maqolada O‘zbekiston xalq yozuvchisi Shukur Xolmirzayev ijodining asosiy tamoyili – haqiqatga sadoqat masalasi tahlil qilingan. Adibning “shafqatsiz realizm” uslubi, hayotni bezaksiz, qanday bo‘lsa shundayligicha tasvirlash mahorati, inson ruhiyatining teran psixologik tahlili va milliy qadriyatlarni yoritishdagi o‘ziga xos uslubi o‘rganilgan. Yozuvchining “To‘lqinlar”, “Oq otli”, “So‘nggi bekat”, “Yo‘lovchi”, “Qil ko‘prik” kabi asarlari misolida uning haqiqatni bo‘yashdan qochgan ijodkor sifatidagi o‘rni yoritilgan.

KALIT SO‘ZLAR: Shukur Xolmirzayev, haqiqatga sadoqat, shafqatsiz realizm, psixologizm, milliy qadriyatlar, inson ruhiyati, zamon mas‘uliyati, realistik tasvir.

Kirish

Adabiyot – jamiyat ko‘zgusi. Ammo ba‘zi ko‘zgular borki, ular nafaqat aks ettiradi, balki haqiqatning eng nozik qirralarini ham ochib beradi. Shukur Xolmirzayev ana shunday ijodkor edi. U hech qachon haqiqatni bo‘yashga, uni yumshatishga yoki bezashga urinmadi. Hayotni qanday bo‘lsa, shundayligicha – go‘zalliklari va xunukliklari, quvonchlari va qayg‘ulari bilan birga tasvirlash uning ijodiy tamoyiliga aylandi. Aynan mana shu fazilat uni o‘zbek adabiyotining eng o‘ziga xos ijodkorlaridan biriga aylantirdi. Ustoz adib Abdulla Qahhor tomonidan alohida e‘tirof etilgan bu ijodkor o‘zbek nasrining rivojiga ulkan hissa qo‘shdi. Uning hayoti va ijodi bugungi kunda ham adabiyotshunoslar va kitobxonlar diqqat markazida turibdi. Haqiqatni bo‘yashni istamagan ijodkor sifatida u o‘zidan keyingi avlodlar uchun benazir maktab qoldirdi.

Haqiqatni bo‘yashdan qochish – Shukur Xolmirzayev ijodining bosh tamoyili

Shukur Xolmirzayev ijodining bosh mezoni – haqiqatni qanday bo‘lsa, shundayligicha ko‘rsatish edi. U yozuvchining vazifasi o‘quvchini xushomad qilish yoki uni xayoliy dunyolarga olib ketish emas, balki hayotni butun murakkabligi bilan ko‘rsatish, deb hisoblardi. Bu tamoyil uning butun ijodi davomida o‘zgarmasdan saqlanib qoldi. Shu bois uning asarlarida sun‘iy ravishda “yaxshilangan” qahramonlar, siyqasi chiqqan ideal obrazlar deyarli uchramaydi. Uning qahramonlari – tirik odamlar. Ularning kamchiliklari bor, xato qiladilar, ikkilanadilar, ba‘zan yiqiladilar, lekin aynan shu jihatlari bilan ular bizga yaqin va tushunarli. Yozuvchi ularni yuqoridan turib hukm

qilmaydi, aksincha, ular bilan birga yashaydi, birga kechinadi. Bu esa uning asarlariga alohida ishonchlik va ta'sirchanlik baxsh etadi.

Adib “To‘lqinlar” qissasida oddiy insonlarning murakkab ichki kechinmalarini, ularning jamiyatdagi o‘z o‘rnini topish uchun kurashini bezaksiz, real tasvirlaydi. U qahramonlarining yutuqlari bilan birga mag‘lubiyatlarini ham, quvonchlari bilan birga iztiroblarini ham ko‘rsatishdan qochmaydi. Qissada tasvirlangan har bir voqea, har bir kechinma shu qadar haqqoniylik, kitobxon o‘zini asar qahramonlari bilan birga yashayotgandek his qiladi. Aynan mana shu haqqoniylik asarning ta'sir kuchini oshiradi va kitobxonni befarq qoldirmaydi. “To‘lqinlar” qissasi orqali yozuvchi o‘zining haqiqatni bo‘yashdan qochmaslik tamoyilini yaqqol namoyon etgan.

“Oq to‘rg‘ay” hikoyasida esa u insonning tabiat bilan, o‘zligi bilan, jamiyat bilan murakkab munosabatlarini haqqoniy tasvirlaydi. Hikoya qahramoni oddiy bir bola bo‘lsa-da, uning ichki dunyosi, orzu-umidlari, quvonch va qayg‘ulari shu qadar teran va ta'sirli tasvirlanganki, kitobxon beixtiyor uning taqdiriga sherik bo‘ladi. Yozuvchi bolaning ruhiyatidagi eng nozik o‘zgarishlarni, uning atrof-muhit bilan munosabatlarini mahorat bilan komrsatadi. Bu hikoyada ham haqiqatni bo‘yashga, uni yumshatishga urinish yo‘q. Bola hayotidagi qiyinchiliklar, uning ichki kechinmalari qanday bo‘lsa, shundayligicha tasvirlangan.

“Shafqatsiz realism” – haqiqatni bo‘yashdan qochish uslubi

Tanqidchilar Shukur Xolmirzayev uslubini “shafqatsiz realism” deb atashadi. Bu atama adibning hayotni ideallashtirmasdan, aksincha, uning eng og‘riqli, eng murakkab tomonlarini ham ochiq ko‘rsatish mahoratini ifodalaydi. U qishloq hayotining mashaqqatlarini, insonlarning og‘ir taqdirini, ijtimoiy adolatsizliklarni yozishdan cho‘chimadi. Bu “shafqatsiz realism” aslida yozuvchining hayotga, insonga bo‘lgan chuqur hurmati va muhabbatidan kelib chiqqan edi. Chunki u insonni, uning taqdirini, kurashlarini asl holicha ko‘rsatish orqali kitobxonni mustaqil fikrlashga, hayotni chuqroq anglashga undardi.

“Oq otli” hikoyasida u tog‘li hududlardagi odamlarning og‘ir turmushini, ularning tabiat bilan murakkab munosabatlarini haqqoniy tasvirlaydi. Bu tasvirda ortiqcha sentimentallik yo‘q, ammo kitobxon qahramonlarning taqdiriga befarq qaray olmaydi. Yozuvchi tog‘liklarning hayotidagi qiyinchiliklarni, ularning tabiat bilan bo‘lgan kurashini, bir-biriga bo‘lgan munosabatlarini realistik tasvirlaydi. Hikoyada hech qanday bo‘yoqdorlik, sun‘iy go‘zallashtirish yo‘q. Hammasi hayotdagi kabi oddiy va tabiiy. Aynan mana shu haqqoniylik asarning ta'sir kuchini oshiradi.

“Biy” hikoyasida esa u qishloq hayotidagi murakkab ijtimoiy munosabatlarni, odamlar o‘rtasidagi ziddiyatlarni realistik tasvirlaydi. Unda yaxshi va yomonning oddiy bo‘linishi yo‘q, balki hayotning o‘zidagi murakkablik, ziddiyatlar va ularning inson

taqdiriga ta'siri mahorat bilan ko'rsatilgan. Yozuvchi qishloq hayotining barcha murakkabliklarini, odamlar o'rtasidagi munosabatlarning nozik tomonlarini ochib beradi. U hech kimni oqlamaydi va hech kimni ayblamaydi, shunchaki hayotni qanday bo'lsa, shundayligicha ko'rsatadi. Bu esa o'quvchiga o'zi xulosa chiqarish imkonini beradi.

Milliy haqiqatni bo'yashdan qochish

Shukur Xolmirzayev milliy haqiqatni tasvirlashda ham o'z tamoyiliga sodiq qoldi. U o'zbek xalqining, ayniqsa tug'ilib o'sgan Boysun tog'laridagi odamlarning hayotini, ularning mentalitetini, urf-odatlarini chuqur o'rgandi va asarlarida aks ettirdi. Ammo bu aks ettirishda u milliy romantizmga berilmadi. U milliy qadriyatlarning go'zalligi bilan birga, ular ichidagi eskicha qarashlarni, jamiyat taraqqiyotiga to'sqinlik qilayotgan illatlarni ham ko'rsatdi. Uning asarlari orqali biz o'zbek xalqining ruhiy dunyosiga, uning orzu-umidlariga, kechmish va buguniga sayohat qilamiz. Ammo bu sayohat har doim ham yoqimli emas, ba'zan og'riqli va achchiq haqiqatlar bilan yuzmayuz kelamiz.

“Qil ko'pri” romanida u o'tmish va hozirgi zamon o'rtasidagi murakkab dialektikani, milliy o'zlikni saqlash bilan birga zamon bilan hamnafas bo'lish zaruriyatini realistik tasvirlaydi. Unda yozuvchi o'z xalqiga nisbatan cheksiz muhabbat bilan birga, uning kamchiliklarini ko'rsatishdan tap tortmaydi. Roman orqali u milliy mentalitetning ijobiy va salbiy tomonlarini, an'analarning inson hayotidagi o'rnini, ularning zamon bilan to'qnashuvini mahorat bilan tasvirlaydi. Bu esa asarni chuqur falsafiy mazmun bilan boyitadi va kitobxonni o'ylantirishga majbur qiladi.

“Olabo'ji” romanida esa u milliy mentalitetning turli qirralarini, xalqimizga xos fazilatlar va illatlarni mahorat bilan tasvirlaydi. Roman qahramonlari orqali biz o'zbek xalqining murakkab ruhiy olamiga sayohat qilamiz, uning quvonch va qayg'ulariga sherik bo'lamiz. Yozuvchi milliy xarakterning eng nozik tomonlarini, uning ijobiy va salbiy jihatlarini realistik tasvirlaydi. U milliy qadriyatlarni ulug'lash bilan birga, ularning inson taraqqiyotiga to'sqinlik qilayotgan tomonlarini ham ko'rsatishdan cho'chimaydi. Aynan mana shu haqqoniylik romanning badiiy qiymatini oshiradi.

Inson ruhiyati haqiqatini izlash

Haqiqatni bo'yashni istamagan ijodkor sifatida Shukur Xolmirzayev inson ruhiyatining eng murakkab qatlamlariga kirib boradi. Uning qahramonlari bir qarashda oddiy ko'rinsa-da, ularning ichki dunyosi juda murakkab. Yozuvchi ularning ong osti kechinmalarini, ichki ziddiyatlarini, ruhiy iztiroblarini mahorat bilan ochib beradi. U inson ruhiyatining eng nozik qirralarini, eng murakkab kechinmalarini tasvirlashda o'ziga xos mahorat egasidir. Uning asarlarida inson ruhiyatining barcha qirralari –

sevgi va nafrat, quvonch va qayg'u, ishonch va shubha, jasorat va qo'rquv mahorat bilan tasvirlangan.

“So‘nggi bekat” romanida asosiy qahramonning hayot yo'li, uning izlanishlari, xatolari va tushunchalari orqali inson taqdirining murakkab labirintlariga sayohat qilamiz. Yozuvchi bu yerda ham haqiqatni yumshatishga urinmaydi – qahramonini ideallashtirmaydi, aksincha uning barcha zaif tomonlarini, ikkilanishlarini, ba'zan nomuvofiq harakatlarini ham ko'rsatadi. Roman qahramoni orqali biz insonning o'z hayoti, o'z taqdiri oldidagi mas'uliyatini, uning izlanishlar va xatolar orqali haqiqatni anglash yo'lini ko'ramiz. Yozuvchi inson ruhiyatining eng murakkab jihatlarini, uning ichki ziddiyatlarini mahorat bilan ochib beradi.

“Yo‘lovchi” romanida esa inson ruhiyatining eng murakkab qatlamlari, uning o'tmish va kelajak o'rtasidagi ikkilanishlari, o'zligini anglash yo'lidagi izlanishlari mahorat bilan tasvirlangan. Roman qahramoni orqali yozuvchi inson taqdirining murakkabligini, uning o'z hayoti uchun mas'uliyatini chuqur falsafiy tahlil qiladi. Yozuvchi inson ruhiyatidagi eng nozik o'zgarishlarni, uning atrof-muhit bilan munosabatlaridagi murakkabliklarni mahorat bilan ko'rsatadi. Bu romanda ham haqiqatni bo'yashga, uni yumshatishga urinish yo‘q.

Zamon haqiqati va inson mas'uliyati

Shukur Xolmirzayev asarlarida zamon haqiqati va inson mas'uliyati masalasi chuqur yoritilgan. U insonning o'z taqdiri, jamiyat va tarix oldidagi mas'uliyatini turli qirralardan yoritadi. Bunda ham u haqiqatni bo'yashga urinmaydi – insonning mas'uliyatdan qochishini, o'z xatolarini oqlashga urinishlarini, ikkilanuvchanligini ham real tasvirlaydi. Uning asarlarida inson o'z hayoti, o'z tanlovlari, o'z qarorlari uchun mas'ul ekanligi g'oyasi yetakchilik qiladi.

“Yo‘lovchi” romanida asar qahramoni o'z hayoti davomida turli tanlovlar oldida turadi va bu tanlovlarning oqibatlari bilan yuzma-yuz keladi. Yozuvchi oddiy va oson yo'llarni ko'rsatmaydi, balki har bir tanlovning narxi borligini, har bir qaror o'z oqibatlariga ega ekanligini haqqoniy tasvirlaydi. Qahramonning hayoti davomida qilgan tanlovlari, ularning oqibatlari va bu oqibatlar bilan yuzma-yuz kelishi orqali yozuvchi inson mas'uliyatining murakkabligini ko'rsatadi. U insonni oqlashga ham, ayblashga ham urinmaydi, shunchaki hayotiy haqiqatni qanday bo'lsa, shundayligicha tasvirlaydi.

Abdulla Qahhor an'analari va Shukur Xolmirzayev

Shukur Xolmirzayev ijodida ustoz adib Abdulla Qahhor an'analari muhim o'rin tutadi. Abdulla Qahhor o'z vaqtida yosh yozuvchining “To'lqinlar” qissasini yuqori baholab, unga katta umid bog'lagan edi. Bu e'tirof Shukur Xolmirzayev uchun kuchli turtki bo'ldi. U Abdulla Qahhorning hayotni haqqoniy tasvirlash, inson ruhiyatiga chuqur

kirib borish, ortiqcha so'zlardan qochish kabi tamoyillarini o'z ijodida davom ettirdi. Ammo u shu bilan birga o'ziga xos uslubini ham yarata oldi. Abdulla Qahhorning realistik an'alarini davom ettirgan holda, u o'zining “shafqatsiz realism” uslubini yaratdi va o'zbek nasrining rivojiga ulkan hissa qo'shdi.

Xulosa o'rnida aytganda, haqiqatni bo'yashni istamagan ijodkor – bu Shukur Xolmirzayevning eng to'g'ri ta'rifidir. U hayotni bezashga, sun'iy ravishda “yaxshilash”ga urinmadi. Oddiy insonlarning murakkab taqdirini, ularning quvonch va qayg'ularini, yutuq va mag'lubiyatlarini haqqoniy tasvirladi. Bugun uning asarlarini qayta o'qiganimizda, ulardagi haqiqatning qanchalik chuqur va teran ekanligini yana bir bor anglaymiz. Bu haqiqat ba'zan achchiq, ba'zan og'riqli, lekin u doimo pok va samimiy. Aynan mana shu haqiqatga sadoqat Shukur Xolmirzayevni o'zbek adabiyotining buyuk siymolaridan biriga aylantirdi. Uning asarlari avlodlar o'zgarishi bilan eskirib qolmaydi, chunki ularda aks etgan haqiqatlar abadiy. Inson, uning ruhiyati, izlanishlari, quvonch va qayg'ulari – bular hamma zamonlarda ham o'z ahamiyatini saqlab qoladi. Shukur Xolmirzayev bizga mana shu abadiy mavzularni haqqoniy, samimiy va teran tasvirlab bergan ijodkor sifatida qalbimizda yashaydi. Uning haqiqatga sadoqati, hayotni bezaksiz tasvirlash mahorati keyingi avlod yozuvchilari uchun ham muhim maktab bo'lib qoladi.

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FEATURES OF PREPARING THE ORAL CAVITY FOR AMBULATORY SURGERY IN PREPARATION FOR RECONSTRUCTIVE OPERATIONS ON THE JAWS

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Literature sources and clinical experience results indicate that patients with skeletal jaw deformities are admitted for inpatient treatment without adequate surgical sanitation of the oral cavity, nose, nasopharyngeal, and oropharyngeal areas. This leads to an increase in the number of inflammatory complications in the postoperative period. Analysis of our archival materials on the treatment of 35 adult patients with jaw deformities showed that postoperative inflammatory complications were observed in 26% of cases. This also indicates that the duration of inpatient treatment was extended up to 3–4 weeks and that outpatient preparatory measures were not adequately developed based on a complex and interdisciplinary approach.

Research objective: To develop a preoperative outpatient surgical preparation scheme for the oral cavity and maxillofacial area, based on an interdisciplinary approach, aimed at reducing the number of complications and shortening the duration of inpatient treatment in elderly patients suffering from jaw deformities.

From 2006 to 2025, a total of 78 elderly patients underwent a comprehensive examination at the maxillofacial surgery clinic in Tashkent, and outpatient surgical preparation of the oral cavity was carried out according to the scheme improved by us. The patients were aged between 18 and 56 years, including 46 women and 32 men.

The improved outpatient preparation scheme included the following stages (based on an interdisciplinary approach):

- a) Outpatient therapeutic and surgical sanitation of the oral cavity;
- b) Sanitation and treatment of ENT organs;
- c) Operations aimed at preserving teeth, removal of planned teeth, and subsequent orthodontic correction;
- d) Operations to eliminate soft tissue anomalies of the oral cavity, compactosteotomy, and minor intraoral bone-plastic operations within separate segments of the jaw tooth rows, carried out together with orthodontic treatment;
- d) If necessary, consultation with an orthopedic dentist, psychologist, psychiatrist, and other specialists.

Based on the proposed scheme, the outpatient patients who underwent examination were divided into two groups. The first group included 47 patients with retro-micrognathia of the upper jaw and pro-macrognathia of the lower jaw. The second group included 31 patients with pro-macrognathia of the upper jaw and retro-micrognathia of the lower jaw. After comprehensive preparation, all patients were referred to the inpatient department to undergo the main stage of orthognathic correction. In the inpatient department, bimaxillary orthognathic surgeries were performed in 26 patients of the first group, while only the upper or lower jaw was operated on in 21 patients. In the second group, both jaws were operated on in 15 patients and only the upper jaw was operated on in 16 patients.

The average duration of bone-reconstructive operations was 3.25 hours. After major reconstructive operations, inflammatory complications (6.6% instead of 26%) were observed in two patients: in one case, sinusitis, and in another, the formation of a ligature fistula was noted. As a result of the prescribed general and local treatment, the sites of inflammation were eliminated. The average duration of hospitalization depending on the volume of surgical intervention was 6 ± 3.3 days (previously 16–18 days). Thus, the results of our clinical experience in applying an interdisciplinary outpatient preparation scheme for the oral cavity showed a significant reduction in the number of inflammatory complications in patients with jaw skeletal deformities, a decrease in the volume of surgery, and a reduction in the duration of hospitalization.

ЗНАЧЕНИЕ ОПУХОЛЕВОГО МИКРООКРУЖЕНИЯ В ТЕРАПИИ И ПРОГНОЗЕ РАКА МОЛОЧНОЙ ЖЕЛЕЗЫ

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Актуальность. Рак молочной железы занимает ведущее место в структуре онкологической заболеваемости среди женщин во всём мире и остаётся одной из основных причин смертности. Несмотря на значительный прогресс в диагностике и лечении, клинические исходы остаются переменными, что обусловлено выраженной биологической гетерогенностью опухоли. В последние годы особое внимание уделяется опухолевому микроокружению (tumor microenvironment, TME), которое рассматривается как один из ключевых факторов, определяющих рост опухоли, метастазирование, иммунное уклонение и развитие лекарственной устойчивости. Компоненты TME, включая иммунные клетки, фибробласты, сосудистую сеть и внеклеточный матрикс, формируют сложную регуляторную систему, влияющую на эффективность терапии и прогноз заболевания. В связи с этим изучение роли опухолевого микроокружения является актуальным направлением современной онкологии и основой для развития персонализированной медицины.

Цель исследования. Оценить влияние опухолевого микроокружения на эффективность лечения, течение заболевания и прогноз у пациенток с раком молочной железы.

Материалы и методы. Исследование проведено на базе Хорезмского регионального филиала Республиканского специализированного научно-практического медицинского центра онкологии и радиологии. В исследование включено 80 пациенток с морфологически верифицированным раком молочной железы в возрасте от 32 до 74 лет.

Все пациентки проходили обследование, лечение и динамическое наблюдение в одном учреждении, что обеспечило однородность клинических данных и терапевтических подходов. В зависимости от характеристик опухолевого микроокружения пациентки были разделены на две сопоставимые группы.

Первая группа (40 пациенток) включала пациенток с высокой активностью опухолевого микроокружения, для которых были характерны выраженная инфильтрация опухоли лимфоцитами (более 20%), высокая плотность CD8⁺ T-

лимфоцитов и наличие экспрессии PD-L1. Данный тип микроокружения расценивался как «иммунно-активный» и ассоциировался с усиленным противоопухолевым иммунным ответом.

Во вторую группу (40 пациенток) вошли пациентки с низкой активностью TME, характеризующейся слабой иммунной инфильтрацией, низким уровнем CD8+ клеток, отсутствием или минимальной экспрессией PD-L1, а также преобладанием стромальных компонентов, включая активированные фибробласты и плотный внеклеточный матрикс. Такой тип микроокружения определялся как «иммунно-холодный» и был связан с иммуносупрессией.

Для оценки структуры и активности опухолевого микроокружения проводилось гистологическое и иммуногистохимическое исследование опухолевых образцов. Анализ включал определение экспрессии маркеров CD3, CD8, FOXP3, PD-L1, α -SMA и VEGF. Параллельно оценивались клинические показатели, включая ответ на проводимую терапию, частоту рецидивов, безрецидивную и общую выживаемость.

Результаты. Проведённый анализ показал, что особенности опухолевого микроокружения оказывают существенное влияние на клиническое течение заболевания и эффективность лечения. У пациенток первой группы с высокой иммунной активностью отмечался более выраженный ответ на химиотерапию и иммунотерапию, а также более высокие показатели безрецидивной и общей выживаемости.

Высокий уровень опухоль-инфильтрирующих лимфоцитов и CD8+ T-клеток был достоверно связан с повышенной чувствительностью опухоли к лечению и более благоприятным прогнозом. В то же время во второй группе наблюдалось более агрессивное течение заболевания, сопровождающееся повышенной частотой прогрессирования, ранними рецидивами и снижением выживаемости.

Установлено, что выраженная стромальная реакция, активность фибробластов и усиленный ангиогенез способствуют формированию лекарственной устойчивости. Наличие иммуносупрессивных клеток, таких как макрофаги и регуляторные T-лимфоциты, также коррелировало с неблагоприятными исходами. Экспрессия PD-L1 показала двойственную роль, выступая как механизм иммунного уклонения и одновременно как предиктор эффективности иммунотерапии.

Выводы. Опухолевое микроокружение является одним из ключевых факторов, определяющих течение, эффективность лечения и прогноз рака молочной железы. Наличие «иммунно-активного» микроокружения ассоциируется с более благоприятным клиническим исходом и высокой

чувствительностью к терапии, тогда как «иммунно-холодный» тип связан с резистентностью к лечению и неблагоприятным прогнозом. Оценка компонентов ТМЕ позволяет улучшить стратификацию пациенток и оптимизировать выбор лечебной тактики. Результаты исследования, проведённого в Хорезмском регионе, подтверждают необходимость внедрения анализа опухолевого микроокружения в клиническую практику и подчёркивают перспективность таргетного воздействия на ТМЕ в современной онкологии.

ПЕРЕДАЧА МЯЧА КАК БАЗИС ВЗАИМОДЕЙСТВИЯ, ВЗАИМОПОНИМАНИЯ И ОСНОВА СОДЕРЖАНИЯ СОРЕВНОВАТЕЛЬНОЙ ДЕЯТЕЛЬНОСТИ ФУТБОЛИСТОВ И ТРЕНИРОВОЧНОГО ПРОЦЕССА

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Аннотация. В статье анализируется использование передача мяча в соревновательном упражнении.

Ключевые слова: футболисты, ТТД (техники – тактические действия).

Техники – тактическая подготовленность футболистов, развивается и совершенствуется в ходе тренировочного процесса, выражается в ходе соревновательной деятельности в виде разнообразных двигательных действий, в сочетании с владением мячом в условиях жесткой и высокоинтенсивной игры. Результативные (точные) командные, групповые тактические действия игроков в своей совокупности являются проявлением сущности соревновательной борьбы, с другой стороны, определяют успех команды в противоборстве с соперником в официальной игре, турнире [2]. В последние годы все чаще высказывается мнение о том, что футбол является одной из форм искусства. Бывший президент ФИФА Жоао Авеланж в одном из своих интервью отметил, что, по его мнению, «Футбол – это самый волнующий театр из всех существующих в мире». Известный специалист В.К. Elliot характеризует красоту футбола проявляющейся в быстрых и ритмичных движениях, связанных с передачей мяча, при условии, что эти движения оправданы необходимостью. Важно отметить, что компетентные специалисты рассматривают передачу мяча как ведущее технико – тактическое действие основное содержание игровой деятельности по футболу. В свою очередь передача мяча – это основа взаимодействия, взаимопонимания, взаимосвязь. Несомненно, изложенное становится понятным, и что передача должна занимать наибольшее количество времени при многолетней подготовке футболистов. Известно, что более 85% игра состоит из передач мяча. По мнению автора [1] игра команды, владеющая мячом, имеет временное преимущество перед обороняющимися, которым требуется определенное время для разгадывания хода атакующих и принятия

мер противодействия. Данное временное преимущество является физиологической основой комбинаторики, которые необходимо научиться использовать с помощью наигранных до автоматизма целесообразных взаимодействий и комбинаций. В то же время специалисты по физиологии отмечают, что в процессе освоения игры, команда, владеющая мячом, где игроки взаимодействуют между собой с использованием комбинаций, где базисным компонентом соревновательной деятельности является передача мяча. В 2008/09 годах победителем Лиги чемпионов УЕФА стала Барселона, а национальная сборная Испании выиграв первенство Европы, и как утверждает автор результат в технике владения мячом – в среднем 529, и приводится среднее количество точных передач за игру 459, Голландия 395, Португалия 347, Италия 327, Россия 315, Турция 293, Хорватия 284 [Схема 1].

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Схема 1. Среднее количество передач, отданных за игру в матчах первенство Европы 2008 года.

Как следует из приведённых данных показатели ТТД игроков в футболе в ходе соревновательной деятельности весьма вариативны [1].

Вместе с тем системный анализ показателей ТТД, в том числе по параметрам результативности передач мяча позволяет оценить уровень ТТД игроков и команды в целом, как следствие, внести необходимые коррективы в тренировочный и соревновательный процессы.

Цель исследования. Выявить количественные показатели ТТД футболистов U-17 и на их основе дать оценку результативности передач мяча в условиях тренировочной соревновательной национальной сборной Республики Узбекистан занявшее первое место в Кубке Азии 2025 года, которая была победителем и в 2012 году.

Важно отметить, что сборные Республики Узбекистан U-17, в матчах Кубка Азии состоявшийся в апреле 2025 года в Саудовской Аравии не проиграли ни одного

матча. В работе приводятся только отдельные матчи, так как педагогическое наблюдение проводилось при просмотре матча по телевизору. Фиксировались точные передачи мяча (точные, дальние, средние, короткие), стандартные положения, удары по воротам, обводки соперника (эффективные, не эффективные). В итоге подсчитывались общее количество ТТД (точных и не точных), подсчитывалось эффективность ТТД (делением положительных действий на общее количество).

В дальнейшей работе по совершенствованию ТТД необходимо повысить эффективность ТТД, так как соревнования для команд возраста U-17 проходят в групповом турнире и улучшить использование средств по восстановлению, так как матчи могут проходить и каждый день или через один день (по рекомендациям специалистов это бег по воде на пляже, использование средств из других видов спорта, фармакологические средства).

Ниже приведены некоторые данные игровой деятельности команд участниц Кубка Азии U-17 состоявшейся в апреле 2025 года в Саудовской Аравии.

Сравнительные данные юных футболистов U-17 в матчах Кубка Азии 2025 года

Показатель	Количество ТТД	Эффективность
Иран	86	Эффективность 48%
КНР	115	Эффективность 41%
Арабские Эмираты	115	Эффективность 48%

Наибольшее количество взаимодействий выявлено у команды сборной Арабских Эмиратов. Всё-таки матчи проходят в медленном темпе в условиях сухого жаркого климата и повышенной влажности.

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MINTAQALARARO IQTISODIY TAFOVUTLARNI O'LGHASH KO'RSATKICHLARI

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Annotatsiya. Mazkur ishda mintaqalararo iqtisodiy tafovutlarni o'lchashda qo'llaniladigan iqtisodiy, ijtimoiy, infratuzilmaviy va demografik ko'rsatkichlar tizimi kompleks yondashuv asosida tahlil qilingan. Tadqiqotda yalpi hududiy mahsulot, investitsiyalar, bandlik va mehnat unumdorligi kabi makroiqtisodiy indikatorlar bilan bir qatorda, aholi daromadlari, kambag'allik darajasi va inson kapitali ko'rsatkichlari ham chuqur o'rganilgan. Shuningdek, transport, raqamli va energetika infratuzilmasi hamda demografik omillar — aholi o'sishi, migratsiya va urbanizatsiya jarayonlarining hududiy rivojlanishga ta'siri yoritilgan.

Kalit so'zlar. Iqtisodiy ko'rsatkichlar, ijtimoiy ko'rsatkichlar, infratuzilma rivoji, demografik omillar, yalpi hududiy mahsulot, bandlik darajasi, migratsiya, urbanizatsiya.

Аннотация. В данной работе на основе комплексного подхода проанализирована система экономических, социальных, инфраструктурных и демографических показателей, используемых для измерения межрегиональных экономических различий. В исследовании наряду с макроэкономическими индикаторами, такими как валовой региональный продукт, инвестиции, занятость и производительность труда, подробно рассмотрены показатели доходов населения, уровня бедности и человеческого капитала. Также освещено влияние транспортной, цифровой и энергетической инфраструктуры, а также демографических факторов — роста населения, миграции и урбанизации — на региональное развитие.

Ключевые слова. Экономические показатели, социальные показатели, развитие инфраструктуры, демографические факторы, валовой региональный продукт, уровень занятости, миграция, урбанизация.

Abstract. This study analyzes the system of economic, social, infrastructural, and demographic indicators used to measure interregional economic disparities through a comprehensive approach. The research examines macroeconomic indicators such as gross regional product, investments, employment, and labor productivity, alongside in-depth analysis of population income, poverty levels, and human capital metrics. In addition, the study considers transport, digital, and energy infrastructure, as well as

demographic factors—including population growth, migration, and urbanization—and their impact on regional development.

Keywords. Economic indicators, social indicators, infrastructure development, demographic factors, gross regional product, employment rate, migration, urbanization.

Hududlar o'rtasidagi iqtisodiy rivojlanish darajasidagi farqlar zamonaviy iqtisodiyotning eng dolzarb muammolaridan biri hisoblanadi. Har qanday mamlakatda tabiiy resurslar taqsimoti, ishlab chiqarish salohiyati, infratuzilma rivoji va inson kapitalining hududlar bo'yicha turlicha shakllanishi natijasida iqtisodiy tafovutlar yuzaga keladi. Ushbu tafovutlar nafaqat iqtisodiy samaradorlikka, balki aholi farovonligi, ijtimoiy barqarorlik va hududiy siyosat samaradorligiga ham bevosita ta'sir ko'rsatadi. Shu sababli mintaqalararo iqtisodiy tafovutlarni aniq o'lchash va ularni ilmiy asoslangan mezonlar yordamida baholash hududiy rivojlanishni boshqarishning muhim instrumenti hisoblanadi.

Mintaqalararo tafovutlarni baholash jarayonida eng muhim masala — mos ko'rsatkichlar tizimini shakllantirishdir. Chunki hududlar rivojlanish darajasini faqat bitta indikator orqali aniqlash mumkin emas. Amaliyot shuni ko'rsatadiki, iqtisodiy tafovutlarni kompleks baholashda makroiqtisodiy, ijtimoiy, demografik va infratuzilmaviy ko'rsatkichlarning o'zaro uyg'un tizimi qo'llanilishi zarur. Ayniqsa, yalpi hududiy mahsulot hajmi va uning jon boshiga nisbati iqtisodiy faollik darajasini aks ettiruvchi asosiy ko'rsatkich sifatida keng qo'llanadi. Shu bilan birga, investitsiya oqimi, mehnat unumdorligi va bandlik darajasi hududning iqtisodiy salohiyatini chuqurroq baholash imkonini beradi.

Ijtimoiy ko'rsatkichlar esa iqtisodiy rivojlanish natijalarining aholi turmush darajasida qanday aks etayotganini aniqlashga xizmat qiladi. Aholi daromadlari, kambag'allik darajasi va ishsizlik ko'rsatkichlari hududiy tengsizlikning ijtimoiy jihatlarini ochib beradi. Bundan tashqari, ta'lim va sog'liqni saqlash xizmatlaridan foydalanish imkoniyatlari hududlar rivojlanishining barqarorligini baholashda muhim mezon hisoblanadi. Zamonaviy tadqiqotlarda iqtisodiy tafovutlarni o'lchashda infratuzilma rivojlanganligi, xususan transport tarmoqlari, raqamli texnologiyalar va energetika ta'minoti darajasi ham tobora muhim ahamiyat kasb etmoqda.

Tafovutlarni baholashda nafaqat ko'rsatkichlar to'plamini tanlash, balki ularni tahlil qilish metodologiyasi ham katta ahamiyatga ega. Statistik va iqtisodiy-matematik usullar hududlar o'rtasidagi farqlar darajasini miqdoriy ifodalash imkonini beradi. Variatsiya koeffitsienti hududlar ko'rsatkichlari tarqalish darajasini aniqlashga xizmat

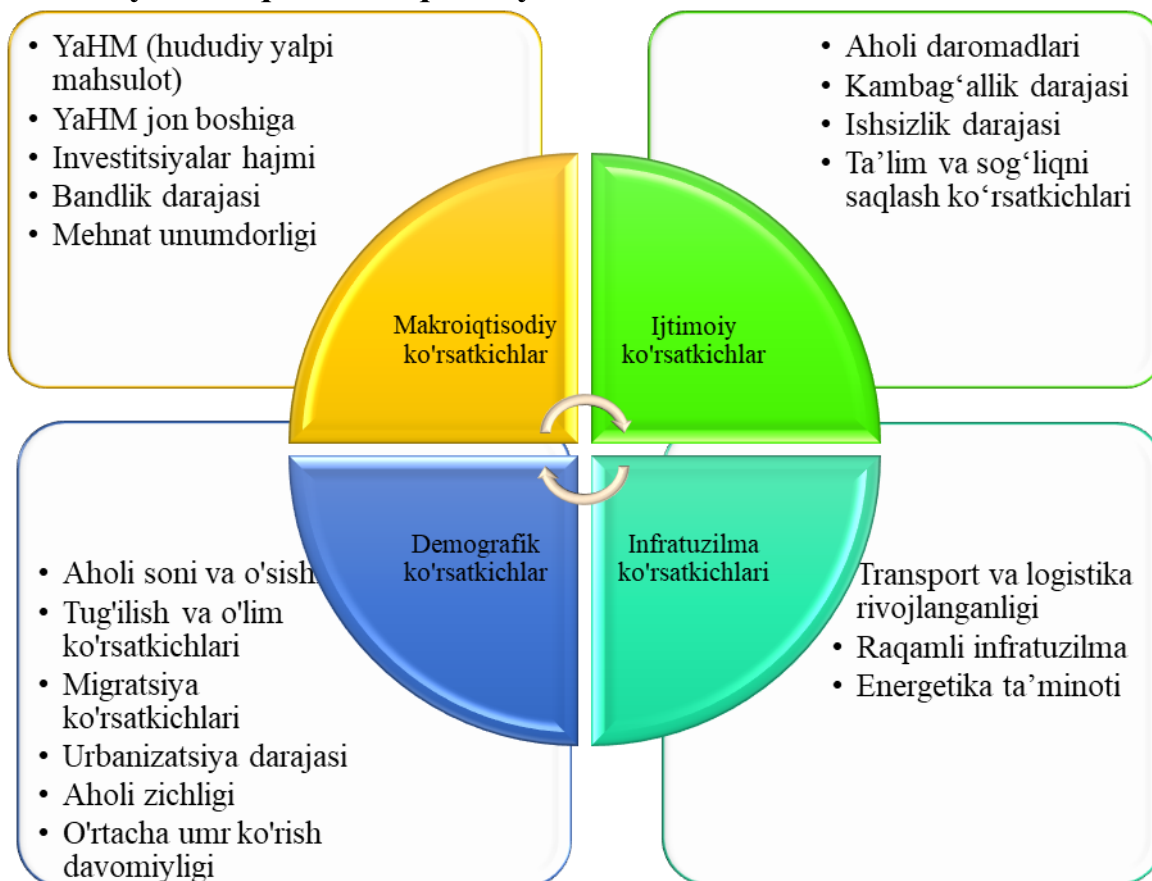
qilsa, Gini koeffitsienti iqtisodiy notenglik darajasini baholashda keng qo'llanadi. Theil indeksi esa tafovutlarni tarkibiy qismlarga ajratib tahlil qilish imkonini beruvchi muhim analitik vosita hisoblanadi. Ushbu usullarni qo'llash hududiy siyosatni shakllantirishda ilmiy asoslangan xulosalar chiqarish imkonini yaratadi.

Baholash mezonlarini ishlab chiqishda kompleks yondashuv muhim hisoblanadi. Chunki hududiy rivojlanish ko'p omilli jarayon bo'lib, uni bir nechta indikatorlarning integratsiyalashgan bahosi orqali aniqlash maqsadga muvofiqdir. Shu nuqtai nazardan, integral indekslar tizimini shakllantirish hududlarni rivojlanish darajasi bo'yicha guruhlash va ustuvor yo'nalishlarni aniqlash imkonini beradi. Bunday yondashuv mintaqaviy siyosatning maqsadli va samarali amalga oshirilishiga xizmat qiladi.

Umuman olganda, mintaqalararo iqtisodiy tafovutlarni o'lchash ko'rsatkichlari va baholash mezonlarini chuqur o'rganish hududiy rivojlanish jarayonlarini ilmiy asosda tahlil qilish, resurslarni optimal taqsimlash va ijtimoiy-iqtisodiy tenglikni ta'minlash uchun zarur metodologik asosni yaratadi. Shu bois mazkur bo'limda hududiy tafovutlarni o'lchash indikatorlari tizimi va ularni baholash mezonlari kompleks yondashuv asosida ko'rib chiqiladi.

1-jadval

Asosiy mintaqalararo iqtisodiy tafovutlarni o'lchash ko'rsatkichlari



1. **Makroiqtisodiy ko'rsatkichlar.** Yalpi hududiy mahsulot mintaqaning jami iqtisodiy faolligini ko'rsatuvchi eng asosiy ko'rsatkichlardan biridir. U ma'lum davr mobaynida hududda yaratilgan barcha yakuniy tovar va xizmatlar qiymatini aks ettiradi. YaHM hudud iqtisodiy salohiyati, ishlab chiqarish hajmi va bozor faolligi haqida umumiy tasavvur beradi. Mintaqalararo taqqoslashda YaHM hajmi hududlarning iqtisodiy og'irlik markazini aniqlashda muhim ahamiyatga ega.

Jon boshiga YaHM - mazkur ko'rsatkich iqtisodiy rivojlanish darajasini aholiga nisbatan baholash imkonini beradi. YaHMning yuqori hajmi har doim ham aholi farovonligi yuqori ekanini anglatmaydi, shuning uchun jon boshiga ko'rsatkich hududlar o'rtasidagi real iqtisodiy tafovutlarni aniqlashda ancha aniq indikator hisoblanadi. U hududiy siyosatda tenglashtirish choralari belgilashda keng qo'llanadi.

Shuningdek, investitsiyalar mintaqaning kelajakdagi iqtisodiy o'sish salohiyatini ifodalaydi. Kapital qo'yilmalar hajmining yuqoriligi ishlab chiqarish modernizatsiyasi, yangi ish o'rinlari yaratilishi va innovatsion faoliyat kengayishini anglatadi. Hududlar o'rtasida investitsiya oqimlarining notekis taqsimlanishi iqtisodiy tafovutlarning chuqurlashishiga olib kelishi mumkin. Bandlik darajasi esa hudud iqtisodiyotining mehnat resurslaridan foydalanish samaradorligini ko'rsatadi. Yuqori bandlik darajasi iqtisodiy faollik va daromadlar barqarorligini bildiradi. Ushbu ko'rsatkich hududiy mehnat bozori holatini baholash hamda iqtisodiy siyosat samaradorligini aniqlashda muhimdir.

Mintaqalararo iqtisodiy tafovutlarni aniqlashda foydalaniladigan yana bir ko'rsatkich bu mehnat unumdorligidir. Mehnat unumdorligi ishlab chiqarilgan mahsulot hajmining band aholiga nisbati orqali aniqlanadi. Bu indikator hududda texnologiya darajasi, ishlab chiqarish samaradorligi va inson kapitali sifati haqida muhim ma'lumot beradi. Yuqori unumdorlik odatda yuqori daromad va iqtisodiy raqobatbardoshlik bilan bog'liq bo'ladi.

2. **Ijtimoiy ko'rsatkichlar.** Aholining o'rtacha daromadlari hududiy farovonlik darajasini aks ettiruvchi asosiy mezonlardan biridir. Daromadlar miqdori nafaqat iqtisodiy rivojlanish, balki iste'molchilarning talabi va ularning hayot sifati darajasini ham belgilaydi. Hududlar kesimida daromadlar farqi ijtimoiy tengsizlikning muhim ko'rsatkichi hisoblanadi. Shuningdek, kambag'allik darajasi iqtisodiy o'sish natijalari aholining barcha qatlamlariga qanchalik taqsimlanayotganini ko'rsatadi. Yuqori kambag'allik darajasi hududiy rivojlanishning inklyuziv emasligini bildiradi. Ushbu indikator hududiy ijtimoiy siyosat samaradorligini baholashda muhim ahamiyatga ega. Ishsizlik esa mehnat bozoridagi muvozanatni aks ettiradi. Uning yuqori darajasi hududda iqtisodiy faollik pastligi yoki strukturaviy muammolar mavjudligini

ko'rsatadi. Ishsizlik ko'rsatkichi iqtisodiy barqarorlik, migratsiya jarayonlari va ijtimoiy xavfsizlik bilan chambarchas bog'liq. Shu bilan birga, inson kapitali sifati hududiy rivojlanishning uzoq muddatli omili hisoblanadi. Ta'lim darajasi mehnat resurslari malakasini belgilasa, sog'liqni saqlash ko'rsatkichlari mehnat unumdorligi va aholi umr davomiyligiga ta'sir qiladi. Ushbu indikatorlar hududiy rivojlanishning barqarorligini baholashda muhimdir.

3. Infratuzilma ko'rsatkichlari. Transport infratuzilmasi hudud iqtisodiy integratsiyasi va bozorlar bilan bog'lanish darajasini belgilaydi. Yo'l tarmoqlari sifati, yuk tashish hajmi va logistika markazlari mavjudligi hududning investitsion jozibadorligini oshiradi. Transport rivoji hududiy tafovutlarni kamaytirishda muhim omil hisoblanadi. Zamonaviy iqtisodiyotda internet qamrovi, raqamli xizmatlar va axborot texnologiyalari rivojlanganligi hududlarning raqobatbardoshligini belgilovchi muhim omilga aylanganligi ham iqtisodiy tafovutlar qay darajada ekanligini yaqqol namoyon qiladi. Raqamli infratuzilmaning rivoji innovatsiyalar, elektron savdo va xizmatlar sektorining kengayishiga xizmat qiladi. Shu bilan birga, barqaror energiya ta'minoti ishlab chiqarish jarayonlarining uzluksizligini ta'minlaydi. Elektr energiyasi va boshqa energiya resurslariga kirish imkoniyatlari hududiy iqtisodiy faoliyatning asosiy shartlaridan biridir. Energetika infratuzilmasidagi tafovutlar hududlar o'rtasidagi iqtisodiy nomutanosiblikni kuchaytirishi mumkin.

4. Demografik ko'rsatkichlar. Birinchi navbatda, aholi soni va uning o'sish sur'ati hududning demografik salohiyatini ifodalaydi. Aholi sonining barqaror o'sishi ichki iste'mol bozorining kengayishiga, mehnat resurslari taklifining ortishiga va ishlab chiqarish hajmining ko'payishiga xizmat qiladi. Biroq haddan tashqari yuqori o'sish ijtimoiy infratuzilma va bandlik tizimiga bosim o'tkazishi mumkin. Shu sababli aholi o'sish sur'atini iqtisodiy imkoniyatlar bilan uyg'un holda tahlil qilish muhimdir.

Demografik jarayonlarning asosiy ko'rsatkichlaridan biri tug'ilish va o'lim darajasi hisoblanadi. Tug'ilish darajasi hududning reproduktiv salohiyatini aks ettirsa, o'lim darajasi sog'liqni saqlash tizimi, turmush sifati va ekologik sharoit bilan bog'liq omillarni namoyon etadi. Ushbu ikki ko'rsatkich o'rtasidagi farq tabiiy o'sish darajasini belgilaydi. Tabiiy o'sish ijobiy bo'lgan hududlarda yosh aholi ulushi yuqori bo'lib, uzoq muddatli iqtisodiy rivojlanish uchun mehnat resurslari bazasi shakllanadi. Migratsiya ko'rsatkichlari hududlar o'rtasidagi iqtisodiy jozibadorlik darajasini baholash imkonini beradi. Ijobiy migratsiya balansi odatda ish o'rinlari ko'pligi, yuqori daromad darajasi va rivojlangan infratuzilma mavjudligini bildiradi. Aksincha, salbiy migratsiya oqimi iqtisodiy imkoniyatlarning cheklanganligini ko'rsatishi mumkin. Shu bois migratsiya ko'rsatkichlari hududiy tafovutlarni aniqlashda muhim indikator sifatida qo'llaniladi.

Hududiy rivojlanishni baholashda urbanizatsiya darajasi ham muhim o‘rin tutadi. Shahar aholisi ulushining ortishi sanoatlashuv va xizmatlar sektorining rivojlanishi bilan bevosita bog‘liq. Urbanizatsiya iqtisodiy samaradorlikni oshirishi mumkin, biroq nazoratsiz urbanizatsiya infratuzilma muammolari va ijtimoiy tengsizlikni keltirib chiqarishi ehtimoli mavjud. Shuning uchun urbanizatsiya jarayonlarini muvozanatli boshqarish zarur.

Demografik ko‘rsatkichlar tizimida alohida ahamiyatga ega bo‘lgan indikatorlardan biri — o‘rtacha umr davomiyligidir. Ushbu ko‘rsatkich aholi salomatligi, turmush sifati va ijtimoiy himoya darajasini aks ettiradi.

Shunday qilib, mintaqalararo iqtisodiy tafovutlarni o‘lchash va baholashda kompleks yondashuvni qo‘llash hududiy rivojlanishni boshqarish, resurslarni optimal taqsimlash va ijtimoiy-iqtisodiy tenglikni ta‘minlash uchun zarur metodologik asos yaratadi. Makroiqtisodiy ko‘rsatkichlar, jumladan, yalpi hududiy mahsulot, investitsiyalar, bandlik darajasi va mehnat unumdorligi hududlarning iqtisodiy salohiyati va faolligini ko‘rsatadi. Ijtimoiy ko‘rsatkichlar – daromadlar, kambag‘allik darajasi, ishsizlik va inson kapitali sifati – iqtisodiy rivojlanish natijalarining aholi turmushiga ta‘sirini namoyon qiladi.

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THE INTERRELATIONSHIP OF INNOVATION, DIGITAL TRANSFORMATION AND SUSTAINABLE DEVELOPMENT

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Abstract: This article analyzes the theoretical foundations of the concepts of innovation, digital transformation, and sustainable development, as well as their interrelationships. It also discusses the role of these processes in the development of the modern economy and society, the impact of digital technologies on sustainable development, and their prospects in the conditions of Uzbekistan.

Keywords: innovation, digital transformation, sustainable development, digital economy, artificial intelligence, ecology, technology, economic growth

Research methodology: This article used the methods of content analysis, comparative analysis, and analysis of regulatory and legal documents. Through these methods, the essence and effectiveness of spiritual and cultural reforms were assessed. Analysis of the concepts of innovation, digital transformation, and sustainable development and their theoretical foundations. The topic was analyzed based on scientific articles, reports, and regulatory documents from international and local sources. Comparative (comparative) method Comparison of how innovation and digital transformation processes are implemented in different countries (Norway, Finland, South Korea, Uzbekistan). Differences and commonalities between sustainable development trends and their results were identified. Statistical method Statistical data on digital transformation and ecological development provided by the State Statistics Committee, the UN, and other international organizations were analyzed. For example, indicators such as the number of people using digital services, the share of renewable energy, and the number of startup projects were studied. Existing research was analyzed to determine how innovation and digital transformation processes are compatible with the principles of sustainable development. Theoretically, global experiences and concepts were analyzed. Practically, innovative projects, startups, and digital systems in Uzbekistan were cited as examples. In the 21st century, global development is developing in close connection with innovative approaches and digital technologies. The fundamental changes taking place in the world economy require countries to develop new strategies. In particular, digital transformation

processes are fundamentally changing production, service, and management systems, forming a new economic model. At the same time, environmental problems and climate change issues require the promotion of the concept of sustainable development. Therefore, innovation, digital transformation, and sustainable development are considered as inextricably linked processes. Innovation and their role in economic development. The concept of innovation is one of the main factors of economic development. Innovations serve to create new products, increase production efficiency, and ensure market competitiveness.

- Innovative activity is manifested in the following areas:
- technological innovations,
- organizational innovations,
- marketing innovations.

In the modern economy, innovations are formed based on knowledge and scientific research. Therefore, the science and education system play an important role in innovative development. Digital transformation and its importance Digital transformation is the process of introducing digital technologies in all sectors of the economy and society. This process is carried out through the following technologies: sun'iy intellekt (AI),

- Big Data,
- Cloud computing,
- Internet of Things (IoT).

As a result of digital transformation the quality of services increases, the management system becomes simpler, transparency and efficiency are ensured. Today, e-government systems are widely introduced in public administration. This creates convenience for citizens and reduces the risk of corruption. Sustainable development means meeting the needs of the present generation without limiting the opportunities of future generations. This concept includes three main areas

- Economic stability
- Social justice
- Ecological balance

Today, global climate change, depletion of natural resources, and environmental problems are increasing the urgency of sustainable development. The interrelationship of innovation, digital transformation, and sustainable development. These three concepts are closely related to each other, and their harmony forms the basis of modern progress.

Firstly, innovation is a key tool for ensuring sustainable development. For example, green technologies play an important role in solving environmental problems.

Secondly, digital transformation allows for the efficient use of resources. For example, the concept of "smart cities" helps to save energy and water resources.

Thirdly, digital technologies serve to ensure social equality. Services such as distance learning and telemedicine create broad opportunities for the population. Thus, innovation and digital transformation are the main drivers of sustainable development. In recent years, Uzbekistan has been implementing large-scale reforms to develop the digital economy. In particular, public services are being digitized, IT parks are being created, and startup projects are being supported. In addition, special attention is paid to the use of renewable energy sources, solving environmental problems, and developing a "green economy". In the future, the development of innovations, expanding digital infrastructure, and ensuring environmental sustainability will remain one of the priorities. In conclusion, innovation, digital transformation, and sustainable development are important factors in the development of modern society. Their mutual integration is of great importance in ensuring economic growth, improving social well-being, and solving environmental problems. Therefore, the comprehensive development of these areas should be one of the priorities of every state.

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MORPHOFUNCTIONAL ALTERATIONS OF THE ESOPHAGUS INDUCED BY CARBON MONOXIDE EXPOSURE AND POTENTIAL APPROACHES FOR THEIR CORRECTION

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Objective: To investigate structural and immunohistochemical alterations in the esophagus caused by prolonged carbon monoxide (CO) exposure and to assess the therapeutic potential of phytochemicals derived from *Silybum marianum* (milk thistle) and *Carthamus tinctorius* (safflower)

Materials and Methods: A total of 200 outbred white rats (200–250 g) were included in the experiment and randomly assigned to four groups: control; chronic CO exposure; CO + *Silybum marianum*; CO + *Carthamus tinctorius*.

Chronic CO intoxication was simulated by exposing animals to concentrations of 200–300 mg/m³ (0.02–0.03%) for 1–2 hours daily, 5–6 times per week, over a period of 1–3 months to induce sustained hypoxic conditions.

After completion of the exposure period, the animals were sacrificed, and esophageal tissue samples were collected. Specimens were fixed in 10% neutral formalin, dehydrated, and embedded in paraffin. Sections (5–7 µm) were stained with hematoxylin–eosin and according to Van Gieson.

Immunohistochemical staining was performed using the streptavidin–biotin–peroxidase technique with Ki-67 as a marker of cell proliferation and Bcl-2 as an indicator of anti-apoptotic activity. Quantitative assessment of immunopositive cells was carried out per 1 mm² using morphometric analysis.

Results: Prolonged CO exposure resulted in marked structural deterioration of the esophageal mucosa. Epithelial thickness significantly decreased (from 45 ± 2.3 to 26 ± 1.2 nm), while edema (from 10 ± 0.6 to 20 ± 1.1 nm), inflammatory cell infiltration (from 35 ± 3 to 140 ± 9 cells/mm²), and overall inflammatory activity (from 0.5 ± 0.1 to 4.0 ± 0.2 points) were notably increased.

Administration of phytochemicals mitigated these adverse changes. In the *Carthamus tinctorius* group, epithelial thickness reached 42 ± 2.0 nm, inflammation decreased to 1.5–2.0 points, and infiltration to 60–70 cells/mm². In the *Silybum marianum* group, epithelial thickness was 43 ± 2.1 nm, inflammation 1.3 ± 0.1 points, and infiltration 55 ± 4 cells/mm².

Conclusion: Long-term exposure to carbon monoxide leads to significant morphofunctional impairment of the esophagus. Treatment with phytochemicals

based on *Silybum marianum* and *Carthamus tinctorius* effectively attenuates inflammatory and degenerative alterations. These findings highlight the potential role of plant-based therapies in protecting esophageal tissue under chronic hypoxic conditions.

DIAGNOSIS OF RUBELLA

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Annotation: Rubella is an acute, contagious viral disease of significant public health importance due to its teratogenic effects and potential to cause congenital rubella syndrome (CRS). Although generally mild in children and adults, rubella infection during early pregnancy can result in severe fetal complications, including deafness, cataracts, cardiac defects, and neurodevelopmental disorders. Therefore, accurate diagnosis and effective prophylaxis remain critical components of disease control and elimination strategies.

The diagnosis of rubella presents a challenge due to the nonspecific and often subclinical nature of its clinical manifestations. While the disease is classically associated with a low-grade fever, maculopapular rash, and lymphadenopathy, these symptoms overlap with other viral exanthems, necessitating laboratory confirmation. Serological methods, particularly the detection of rubella-specific IgM antibodies via enzyme-linked immunosorbent assay (ELISA), constitute the cornerstone of diagnosis. In addition, the identification of a significant rise in IgG antibody titers between paired serum samples provides evidence of recent infection. Molecular diagnostic techniques, such as reverse transcription polymerase chain reaction (RT-PCR), have enhanced the sensitivity and specificity of detection, especially in early stages of infection and in cases of congenital transmission. These methods allow for direct identification of viral RNA in clinical specimens, thereby supporting both clinical management and epidemiological surveillance.

Prophylaxis of rubella is primarily achieved through active immunization, which has proven to be highly effective in reducing disease incidence and preventing outbreaks. The live attenuated rubella vaccine, commonly administered as part of the combined measles-mumps-rubella (MMR) vaccine, induces long-lasting immunity in the majority of recipients. Widespread vaccination programs have led to a dramatic decline in rubella cases in many regions; however, gaps in immunization coverage continue to pose risks for resurgence. Special emphasis is placed on the immunization of women of reproductive age, as this is the most effective strategy to prevent congenital rubella

syndrome. Preconception screening for rubella immunity and timely vaccination of seronegative individuals are essential preventive measures.

In addition to vaccination, public health interventions such as surveillance, outbreak response, and infection control practices play a vital role in limiting transmission. Isolation of infected individuals, adherence to respiratory hygiene, and monitoring of susceptible populations contribute to comprehensive disease control. Although passive immunization with immunoglobulin may be considered in certain high-risk situations, it does not replace vaccination as the primary preventive strategy.

Keywords: Rubella; viral infection; diagnosis; prophylaxis; vaccination; IgM antibodies; IgG antibodies; ELISA; RT-PCR; congenital rubella syndrome; immunization; public health surveillance.

Introduction: Rubella is a contagious viral disease that remains a significant concern in global public health, particularly due to its impact on maternal and child health. Despite its typically mild clinical course in children and adults, rubella infection during pregnancy—especially in the first trimester—can lead to severe fetal complications, collectively known as congenital rubella syndrome (CRS). These complications include sensorineural deafness, congenital heart defects, cataracts, and developmental delays, making the disease a major preventable cause of birth defects worldwide.

The epidemiology of rubella has changed considerably with the introduction of effective vaccination programs. In many countries, widespread immunization has led to a substantial decline in incidence; however, outbreaks still occur in regions with insufficient vaccination coverage. This highlights the ongoing need for vigilant surveillance, improved immunization strategies, and public health awareness.

Accurate and timely diagnosis of rubella is essential for both clinical management and prevention of transmission. Given the nonspecific clinical presentation of the disease, laboratory-based diagnostic methods play a crucial role in confirming infection. Advances in serological and molecular techniques have significantly improved the reliability of rubella detection, allowing for early diagnosis and effective outbreak control.

Prophylaxis, primarily through vaccination, represents the most effective strategy for controlling and eliminating rubella. Immunization not only protects individuals but also contributes to herd immunity, thereby reducing the circulation of the virus within populations. Special attention is given to women of reproductive age to prevent congenital infections and associated complications.

This study aims to review the current approaches to the diagnosis and prophylaxis of rubella, emphasizing their importance in reducing disease burden and preventing congenital outcomes.

Main Body: Rubella is caused by an RNA virus belonging to the genus *Rubivirus* and is primarily transmitted through respiratory droplets. The virus enters the host via the upper respiratory tract, replicates in the nasopharynx and regional lymph nodes, and subsequently spreads systemically through viremia. The incubation period typically ranges from 14 to 21 days. In many cases, the infection remains asymptomatic or presents with mild clinical manifestations, which complicates early detection and contributes to unrecognized transmission.

Clinically, rubella is characterized by a maculopapular rash that usually begins on the face and spreads to the trunk and extremities, accompanied by low-grade fever and lymphadenopathy, particularly in the postauricular and suboccipital regions. Arthralgia and arthritis are more commonly observed in adolescents and adults, especially in females. Despite its generally benign course, the infection poses a serious risk during pregnancy due to its teratogenic effects on the developing fetus.

The diagnosis of rubella relies heavily on laboratory confirmation because of the nonspecific clinical features. Serological testing remains the primary diagnostic approach. The presence of rubella-specific IgM antibodies indicates recent infection, while a significant rise in IgG antibody titers between acute and convalescent sera confirms seroconversion. However, false-positive and false-negative results may occur, necessitating careful interpretation in conjunction with clinical and epidemiological data.

Molecular diagnostic techniques, particularly reverse transcription polymerase chain reaction (RT-PCR), have significantly improved the accuracy of rubella detection. This method allows for the direct identification of viral RNA in clinical samples such as throat swabs, blood, and urine. RT-PCR is especially valuable in early stages of infection and in confirming congenital cases, where rapid and precise diagnosis is critical.

The prevention of rubella is primarily based on active immunization. The live attenuated vaccine, most commonly administered as part of the combined measles-mumps-rubella (MMR) vaccine, has demonstrated high efficacy and long-term immunogenicity. Immunization programs targeting children and adolescents have led to a marked reduction in disease incidence in many countries. However, maintaining high vaccination coverage is essential to prevent outbreaks and ensure herd immunity. Particular emphasis is placed on the prevention of congenital rubella syndrome through the immunization of women of childbearing age. Screening for rubella-specific IgG

antibodies before pregnancy is recommended to identify susceptible individuals. Those lacking immunity should be vaccinated prior to conception, as the live vaccine is contraindicated during pregnancy.

In addition to vaccination, public health measures such as disease surveillance, outbreak investigation, and isolation of infected individuals play a critical role in controlling transmission. Infected persons are typically advised to avoid contact with susceptible individuals, especially pregnant women, for at least seven days after the onset of rash. These combined strategies contribute to the overall reduction of rubella incidence and its associated complications.

Conclusion: In conclusion, rubella remains an important infectious disease with significant public health implications, particularly due to its association with congenital rubella syndrome and its severe outcomes in pregnancy. Although the clinical course of rubella is generally mild, its potential to cause irreversible fetal damage underscores the importance of effective prevention and control measures.

Accurate and timely diagnosis, primarily based on serological and molecular methods, plays a crucial role in identifying cases, guiding clinical management, and preventing further transmission. Advances in diagnostic technologies, such as ELISA and RT-PCR, have improved the sensitivity and specificity of detection, enabling better surveillance and outbreak control.

Prophylaxis through vaccination remains the most effective strategy for reducing the incidence of rubella and preventing congenital infections. The widespread use of the measles-mumps-rubella (MMR) vaccine has led to significant progress in controlling the disease globally. However, maintaining high immunization coverage and ensuring access to vaccination, particularly among women of reproductive age, are essential for achieving elimination goals.

In addition, comprehensive public health strategies—including surveillance, health education, and preconception screening—are critical components of rubella prevention programs. The integration of these measures contributes to the reduction of disease burden and supports efforts toward the global eradication of rubella.

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THE ARTISTIC AND SOCIAL FUNCTIONS OF PARODY AND PASTICHE IN MARK TWAIN'S *THE ADVENTURES OF HUCKLEBERRY FINN*

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Abstract. This paper investigates the artistic, structural, and social functions of parody and pastiche in Mark Twain's *The Adventures of Huckleberry Finn*, one of the most influential works in the development of American realist literature. As important literary devices, parody and pastiche allow Twain not only to challenge established literary traditions but also to present a profound critique of 19th-century American society. The research particularly focuses on how Twain transforms these techniques into instruments of social criticism, realism, and literary innovation.

Keywords: parody, pastiche, Mark Twain, American realism, satire, narrative technique, social criticism, intertextuality, Huckleberry Finn

The study demonstrates that parody in the novel operates on several interconnected levels, including literary, social, and moral dimensions. Twain parodies the conventions of romantic adventure novels by presenting a nontraditional hero in the character of Huckleberry Finn. Unlike the idealized protagonists typical of romantic fiction, Huck represents a realistic and psychologically complex character whose moral development is shaped by his personal experiences. His inner conflicts and ethical decisions reflect Twain's intention to replace artificial literary heroism with a more realistic representation of human nature. Moreover, Twain uses parody to criticize the contradictions embedded in American society, particularly issues related to slavery, racial discrimination, social injustice, and religious hypocrisy. Through the friendship between Huck and Jim, Twain presents an alternative moral perspective based on humanity, loyalty, and empathy rather than socially constructed norms. This relationship serves as a central moral axis of the novel and reveals the conflict between individual conscience and socially imposed values. Twain's ironic depiction of

supposedly civilized society further emphasizes the gap between ideological principles and actual behavior.

From a stylistic perspective, pastiche plays a crucial role in shaping the novel's narrative structure. Twain skillfully integrates different linguistic registers, including colloquial speech, regional dialects, and oral storytelling techniques. Huck's narrative voice, characterized by simplicity, spontaneity, and direct communication with the reader, creates a sense of authenticity and emotional immediacy. This approach reflects Twain's innovative contribution to the democratization of literary language by elevating everyday speech into a legitimate artistic medium. In addition, Twain's narrative technique demonstrates elements of intertextuality through the reinterpretation of traditional adventure narratives. The symbolic function of the Mississippi River illustrates Twain's mastery in combining romantic symbolism with realistic representation. While the river traditionally symbolizes freedom and escape, Twain also portrays it as a space of uncertainty and moral testing. This dual representation strengthens the thematic complexity of the novel and demonstrates the writer's ability to merge symbolic and realistic dimensions within one narrative structure. The research findings indicate that Twain expanded the artistic possibilities of parody and pastiche by transforming them from purely stylistic techniques into complex literary strategies capable of addressing serious philosophical and social questions. His narrative experimentation not only strengthened the foundations of American realism but also influenced later literary movements, including modernism and postmodernism, particularly in their use of intertextuality and metafictional elements.

Conclusion. “*The Adventures of Huckleberry Finn*” remains a significant example of how parody and pastiche can function not only as aesthetic devices but also as intellectual tools for social analysis. Twain's literary experimentation continues to attract scholarly attention and confirms the novel's lasting importance in both American and world literature.

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ON IMPROVING THE OUTCOMES OF TREATMENT OF CHRONIC CERVICITIS

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Abstract. A high recovery rate after one course of treatment and a relatively low relapse rate (associated with a change in sexual partner or the presence of a urogenital tract infection) make this drug recommended for the treatment of cervicitis.

Keywords: chronic cervicitis, reproductive age, treatment

Relevance. Chronic cervicitis occurs in one in two gynecological patients and is characterized by an asymptomatic course, the inability to isolate the infectious agent, and difficulty in medical treatment. Inflammatory changes in the vaginal portion of the cervix and inflammatory changes in the vaginal mucosa are similar, so vaginitis often accompanies cervicitis. Chronic cervicitis and vaginitis are particularly common, being diagnosed in one in three women with abnormal leucorrhoea [2, 4, 6, 8, 10, 12]. Diagnosis of exo- and endocervicitis with verification of the infectious agent, most often in the presence of ectopia, is very important, as precancerous processes and cancer often develop. This is due to the fact that chronic inflammation of the cervix influences metaplasia processes in ectopia (proliferation and differentiation of reserve cells) and, in some cases, can lead to the development of dysplasia. Chronic inflammation creates a favorable environment for the development of CIN due to impaired cellular renewal of the epithelial layer and the blood supply to the underlying stroma [14, 15]. In early reproductive age, the cervical epithelium is particularly susceptible to the introduction and persistence of infectious agents due to the presence of physiological ectopia of the columnar epithelium [1, 2]. It is also important to remember that inflammation of the exocervix and endocervix can complicate a full examination, mimicking the appearance of cellular atypia during cytological examination. Therefore, all morphological studies should be performed after the inflammatory process has resolved.

Timely, comprehensive etiotropic therapy for exocervicitis and endocervicitis is essential, as recurrence of the inflammatory process leads to the development of chronic cervicitis.

The aim of this study is to improve the treatment results of chronic cervicitis using the drug benzydamine.

Materials and methods. The study included 76 women of reproductive age, aged 18 to 45, with chronic cervicitis; the average age was 28 ± 3 years. Patients were randomly selected based on their gynecological visits at the Kogon Women's Clinic. Based on clinical, laboratory, and colposcopic examinations, a diagnosis of chronic cervicitis was established. All patients were tested for sexually transmitted infections (chlamydia, mycoplasma, ureaplasma) and viral genital infections (HSV, HPV) using polymerase chain reaction (PCR). The study excluded patients with specific sexually transmitted infections (gonorrhea, chlamydia, trichomoniasis, syphilis), severe extragenital pathologies (diabetes mellitus, thyroid dysfunction), those taking antibacterial medications within the last three months, and pregnant women.

Throughout the study, women used barrier methods (condoms) for contraception. Treatment effectiveness was assessed based on subjective and objective symptom trends and laboratory diagnostic and colposcopic examination results.

Results and discussion. Clinical and colposcopic examinations revealed signs of inflammation in the cervical mucosa in all patients. The main clinical manifestation was abnormal leucorrhoea, the frequency of which at the time of presentation to a gynecologist reached 65 (85.5%). Itching and burning in the genital area were complained of by 17 patients (22.4%). Vaginal pain and discomfort were reported by one in three patients (24 (31.6%)). Colposcopic examination revealed signs of cervicitis in all patients. The most consistent colposcopic symptoms of inflammation, according to our data, were abnormal cervical discharge and hyperemia around the external os of the cervix, as well as dilated subepithelial vessels with a regular course that bleed on contact, and uneven dark-brown epithelial staining during the Schiller test with adequate visualization of the transformation zone. These signs were identified in all patients. Colposcopic examination revealed the development of cervical ectopia in a third of patients. A history review revealed a significant obstetric and gynecological history in 62 (81.6%) patients with chronic cervicitis. Thirty-two (42.1%) patients had undergone induced abortions, 36 (47.4%) had inflammatory diseases of the lower genitalia, 25 (32.9%) had inflammatory diseases of the upper genitalia, and 26 (34.2%) had cervical ectopia. Among patients with chronic cervicitis, almost every second woman—39 (51.3%)—had an early onset of sexual activity. The average age at onset of sexual activity in patients with cervicitis was 17.4 ± 0.6 years ($\chi^2 = 15.6$; $\chi^2 > \chi^2$ critical at $p < 0.05$). More than half of the patients with chronic cervicitis were unmarried, and 41.7% had two or more sexual partners in the past year. Analysis of the disease duration revealed that chronic cervicitis was characterized in all cases by a long, recurrent course. Microscopic examination revealed an elevated white blood cell count (over 30 per field of view) in cervical and/or vaginal discharge

in all patients, indicating a grade IV vaginal flora purity. Taking all factors into account, we used benzydamine, a nonsteroidal anti-inflammatory drug (NSAID) belonging to the indazole group, to treat cervicitis. It has anti-inflammatory and local anesthetic effects, as well as antiseptic activity against a broad spectrum of microorganisms. The drug's mechanism of action involves stabilizing cell membranes, inhibiting prostaglandin synthesis, and suppressing Il-1 and TNF. Benzydamine exerts antibacterial and specific antimicrobial activity by rapidly penetrating microbial membranes, causing damage to cellular structures, disrupting metabolic processes, and causing cell lysis. It also has antifungal activity against *Candida albicans*. Vaginal douching was performed once daily for 10 days. The procedure should be performed lying down, with the fluid remaining in the vagina for several minutes. The entire 140 ml bottle was used for a single douche.

Conclusions. The clinical and laboratory efficacy of the treatment was 86.8%. Insufficient efficacy or ineffectiveness of the treatment was reported in 13.2% due to partner change and/or urogenital tract infection. The mean white blood cell count was 12 per high-power field, and *Gardnerella vaginalis* and *E. coli* were eradicated. No serious adverse events were reported across the entire group during the safety and tolerability assessment.

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PREVALENCE OF DENTAL DISEASES IN ADOLESCENT GIRLS

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Relevance of the study.

Considerable work has been carried out in developing primary prevention of dental diseases, improving its clinical and dental effectiveness, and enhancing the dental care system. However, studies devoted to analyzing and interpreting the results of dental health status among adolescent girls remain incomplete. There is still a need to reduce the incidence of these diseases, develop effective primary prevention methods, and improve the quality of life of adolescent girls. Therefore, continuing research in this area and implementing optimal preventive programs into practice remain pressing issues.

Aim of the study.

To improve the study of the prevalence of dental diseases in adolescent girls.

Object of the study.

Adolescent girls diagnosed with dental diseases were selected.

Results and analysis.

The study of dental health and assessment of dental status in adolescent girls began with collecting patients' life history (anamnesis), which is the first stage of examination. In addition to identifying complaints indicating disease symptoms, surveys made it possible to clarify clinical manifestations.

It was found that all examined patients reported tooth pain at the initial onset of the disease. Objective examination results were analyzed based on pathological changes in the hard tissues of teeth and the oral mucosa. During clinical and functional examination, attention was also paid to exacerbation periods of dental diseases.

Dental examinations of adolescent girls were conducted according to generally accepted schemes. All data were recorded in patients' medical histories. Examination began with an external facial assessment. Particular attention was given to facial asymmetry, general appearance, presence of lesions or swelling on the red border of the lips, as well as the condition and color of skin, nails, mucous membranes, and presence of edema or spots.

In examined patients, swelling and infiltration of facial soft tissues were objectively detected. When masticatory muscles were involved in inflammatory processes, inflammatory contracture of the lower jaw was observed. Among complications of dental diseases in adolescent girls, thickening of the alveolar process of the jaw and

purulent discharge from under the gums were noted. Swelling of the gingiva and transitional folds in the affected tooth area was also observed.

Table 1. Distribution of prevalence rates of dental diseases among adolescent girls by regions

Table 1.
Distribution of prevalence rates of dental diseases among adolescent girls by regions

Diagnosis	Bogot district (n=986)	Yangibazar district (n=933)	Urgench city (n=855)
Moderate caries	17,85±1,22	18,01±1,26	10,18±1,07*
Deep caries	17,04±1,20	16,93±1,23	14,62±1,21
Acute focal pulpitis	16,23±1,17	15,65±0,51	14,15±1,19
Chronic periodontitis	14,81±1,13	16,93±1,23	16,14±1,26
Gingivitis	11,76±1,03	10,18±0,99	6,78±0,86*
Periodontosis	10,95±0,99	10,06±0,98	4,91±0,74*
Wedge-shaped defect	6,29±0,77	4,93±0,71	6,67±0,85
Periodontitis	5,58±0,73	5,79±0,76	2,46±0,53*
Dental calculus	8,92±0,91	10,29±0,99	7,72±0,91
Chronic fibrous pulpitis	0,30±0,17	0,11±0,10	0/0
Chronic hypertrophic pulpitis	0,20±0,14	0/0	0/0

Painful palpation along the transitional fold was recorded based on patient complaints in medical records. During examination, general clinical indicators (blood pressure, pulse rate, respiratory rate) and additional tests (complete blood count, urinalysis, blood glucose level, coagulogram, aminotransferases, creatinine, urea, bilirubin levels, radiological diagnostics, ECG) were used.

Examination of the tongue included assessment of papillae condition and presence of coating. Examination of the oral vestibule and cheeks focused on moisture and color of the mucosa, as well as presence of tooth imprints.

General clinical methods, including visual and instrumental assessment of periodontal soft tissues, were applied. Clinical-functional tests were used to determine gingival condition. Inflammatory reactions were identified using the papillary-marginal index and the Green-Vermillion oral hygiene index.

Diagnosis was established based on anamnesis, complaints, clinical signs, and additional examination methods. Since visual assessment does not always accurately reflect the condition of gingival mucosa, simple and extended gingivostomy (in 61% of cases) was performed. This method was used when boundaries of inflammation were unclear and when it was difficult to assess the extent of epithelial damage and spread of inflammation to gingival papillae, marginal and alveolar gingiva.

Three	degrees	of	hyperemia	were	observed:
1			—		mild;
2			—		moderate;
3			—		severe;

as well as two staining degrees (1 and 2).

Conclusion.

The oral cavity was examined using a set of dental instruments under natural and artificial lighting. During examination, the depth of the oral cavity, level of oral hygiene, and condition of mucosa and periodontium were assessed. Special attention was paid to mucosal color, presence of edema, pain on palpation of gingival margin, bleeding during brushing or consumption of solid food, and presence of halitosis. All pathological changes detected in the oral cavity were recorded in outpatient records, including during initial examination, treatment, and follow-up periods. Changes in each tooth, periodontal tissue, and lesion area were systematically documented.

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CONCEPTUAL FOUNDATIONS OF MEDICINE: A PHILOSOPHICAL ANALYSIS

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Abstract: This paper explores the fundamental intersection between philosophy and clinical medicine, examining how philosophical frameworks shape medical understanding. While modern medicine is often viewed strictly through a biotechnological lens, its core—the definitions of health, disease, and the healing process—remains deeply rooted in ontological and epistemological questions. The study analyzes the shift from a purely biomedical model to a more holistic, humanistic approach. By examining the conceptual foundations of medical practice, the authors argue that a philosophical grounding is essential for medical students and practitioners to navigate the ethical and diagnostic complexities of contemporary healthcare. The

integration of philosophy into medicine does not contradict scientific rigor; rather, it provides the necessary framework for interpreting biological data within the context of human existence.

Keywords: Philosophy of medicine, Epistemology, Bioethics, Clinical reasoning, Medical humanism, Ontological status of disease.

Introduction

The practice of medicine has always been more than the mere application of biological science to human bodies. Since the era of Hippocrates and Avicenna, the art of healing has been inextricably linked to philosophical inquiry. In the contemporary era, however, the rapid advancement of medical technology has occasionally obscured the philosophical foundations that underpin clinical practice. This paper addresses the necessity of revisiting the Conceptual Foundations of Medicine, arguing that a philosophical analysis is not an abstract luxury but a practical necessity for modern healthcare. At its core, medicine operates on several philosophical assumptions. Epistemologically, it asks how we "know" a patient is ill—relying on a blend of empirical data, clinical intuition, and subjective narrative. Ontologically, it seeks to define the nature of "health" and "disease." Is health merely the absence of pathology, or is it a positive state of existential well-being? Furthermore, the doctor-patient relationship is built upon an ethical and humanistic framework that transcends chemical formulas and surgical procedures. For first-year medical students and future practitioners, understanding these concepts is vital. As we move toward a more personalized and technologically driven medical landscape, the ability to think critically and ethically becomes the primary tool for a physician. This article provides a theoretical synthesis of how philosophical thought informs medical diagnosis, the ethics of care, and the overall perception of the human condition in a clinical setting.

Materials and Methods

The methodology of this research is based on a systematic qualitative analysis of classical and contemporary literature at the intersection of philosophy and medicine. The study employs a comparative-historical approach, examining the evolution of medical thought from the Aristotelian and Avicennian traditions to the modern biopsychosocial model. Data sources include: Peer-reviewed journals focusing on Medical Ethics and Bioethics. Foundational philosophical texts regarding Phenomenology (Heidegger, Merleau-Ponty) and their application to the patient experience. Current medical curricula standards to evaluate the role of humanities in medical education. The research utilizes deductive reasoning to apply general philosophical principles to specific clinical scenarios, such as diagnostic uncertainty and end-of-life care decisions.

Results

The analysis yielded three primary findings regarding the conceptual foundations of modern medicine: **The Limitation of Reductionism:** While the biomedical model (viewing the body as a machine) has led to significant technological breakthroughs, it often fails to account for the subjective experience of illness. The results suggest that a purely mechanistic approach leads to "clinical alienation." **Epistemological Diversity:** It was found that clinical diagnosis is not a purely objective process. It is an interpretive act where the physician must synthesize objective clinical signs with the patient's subjective symptoms. **The Role of Values:** The study identifies that every medical decision is value-laden. There is no "value-neutral" medicine; even the selection of a treatment protocol involves philosophical assumptions about the quality of life versus the prolongation of life.

Discussion

The results of this study underscore a critical necessity: the reintegration of philosophical inquiry into the heart of medical practice. The "reductionist" trap of modern medicine—treating the organ rather than the person—is a philosophical error that can lead to physician burnout and patient dissatisfaction. By applying Phenomenology, clinicians can better understand that a patient does not "have" a body, but "is" a body. This shift in perspective transforms the clinical encounter from a technical inspection into a human dialogue. Furthermore, the discussion highlights that Bioethics should not be treated as a set of rigid rules, but as a living philosophical practice. In the face of emerging technologies like AI and genetic engineering, the philosophical question of "What does it mean to be human?" becomes the most practical question a doctor can ask. Ultimately, this analysis suggests that the future of medicine lies in a Theoretical Synthesis. The physician of the 21st century must be a "medical philosopher"—one who possesses the technical skills of a scientist and the reflective wisdom of a humanist.

Conclusion

In conclusion, the philosophical analysis of medical foundations reveals that the practice of healing is inseparable from the understanding of human existence. The transition from a strictly biomedical perspective to a more integrated philosophical-medical model is essential for the evolution of modern healthcare. This study has demonstrated that: Clinical practice is not merely a technical application of biology but an ethical and interpretive art.

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EARLY DIAGNOSIS AND EVALUATION OF TREATMENT EFFECTIVENESS IN CERVICAL DYSPLASIA

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Relevance. Cervical dysplasia, also referred to as cervical intraepithelial neoplasia (CIN), represents a spectrum of premalignant epithelial changes associated with persistent infection by high-risk types of human papillomavirus (HPV), particularly HPV-16 and HPV-18. It is widely recognized as a critical precursor to cervical cancer, which remains one of the leading causes of cancer-related morbidity and mortality among women globally, especially in low- and middle-income countries. The progression from low-grade dysplasia (CIN I) to high-grade lesions (CIN II–III) and eventually invasive carcinoma is a multistep process that may take several years, thereby providing a valuable window for early detection and intervention. Despite the availability of effective screening methods, delayed diagnosis and insufficient coverage of screening programs continue to contribute to high incidence rates. Modern diagnostic approaches, including cytological screening (Pap smear), high-risk HPV DNA testing, and colposcopic evaluation with directed biopsy, have significantly improved early detection rates. The integration of these methods enhances diagnostic accuracy and enables risk stratification, which is essential for selecting optimal treatment strategies.

Aim of the study. The aim of this study was to comprehensively evaluate the effectiveness of early diagnostic methods and to assess the clinical outcomes of different treatment strategies in patients with cervical dysplasia, taking into account the severity of lesions and associated HPV status.

Materials and methods. A prospective clinical study was conducted involving 100 women aged 20–55 years diagnosed with cervical dysplasia of varying severity (CIN I–III). All patients underwent a standardized diagnostic protocol that included cytological examination using the Papanicolaou test, high-risk HPV DNA testing, and colposcopic assessment. Suspicious lesions identified during colposcopy were subjected to targeted biopsy for histopathological confirmation. Based on the severity of dysplasia and clinical indications, patients were stratified into two main groups. The first group included 50 patients with low-grade lesions (CIN I), who were managed

conservatively with observation, antiviral therapy, and immunomodulatory treatment aimed at enhancing viral clearance and epithelial regeneration. The second group consisted of 50 patients with moderate to severe dysplasia (CIN II–III), who underwent surgical intervention, including cryotherapy, laser ablation, or loop electrosurgical excision procedure (LEEP). Patients were followed up for a period of 12 months, during which repeated cytological, virological, and colposcopic assessments were performed. Treatment effectiveness was evaluated based on regression, persistence, or progression of dysplastic lesions, as well as recurrence rates.

Results. The implementation of combined diagnostic methods significantly improved early detection rates, with cervical dysplasia identified at early stages (CIN I) in 75.0% of patients. The combined use of Pap smear and HPV testing demonstrated higher diagnostic sensitivity (92.0%) compared to cytology alone (68.5%), confirming the added value of molecular screening. In the conservative management group, regression of low-grade lesions was observed in 68.0% of patients, which can be attributed to the natural course of HPV infection and the effectiveness of immunomodulatory therapy. However, persistence of lesions was noted in 22.0% of cases, while progression to higher-grade dysplasia occurred in 10.0% of patients, highlighting the need for careful follow-up in this subgroup. In contrast, surgical treatment demonstrated significantly higher effectiveness in patients with CIN II–III. Complete regression of dysplastic lesions was achieved in 90.0% of patients undergoing excisional or ablative procedures. Persistence was observed in only 5.0% of cases, and recurrence during the follow-up period was limited to 5.0%, indicating high efficacy and reliability of surgical management. Additionally, HPV clearance rates were significantly higher in the surgical group (82.0%) compared to the conservative group (54.0%), suggesting that removal of affected tissue contributes to viral elimination. Overall, early diagnosis combined with appropriate treatment reduced the risk of progression to invasive cervical cancer by approximately 75–85%.

Conclusions. Early detection of cervical dysplasia through integrated screening approaches significantly enhances diagnostic accuracy and allows timely initiation of appropriate treatment. Conservative management may be effective in selected patients with low-grade lesions; however, surgical treatment remains the most reliable method for achieving complete regression in moderate to severe dysplasia. The results of this study underscore the importance of implementing comprehensive screening programs, incorporating HPV testing, and adopting individualized treatment strategies based on lesion severity and virological status. Such an approach is essential for reducing the burden of cervical cancer and improving long-term reproductive and oncological outcomes in women.

THE CONCEPT OF REGIONAL COMPETITIVENESS AND ITS ECONOMIC CONTENT

(as an example of Khorezm region)\

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Abstract. This thesis examines the concept of regional competitiveness and its economic content from a theoretical perspective, using the case of the Khorezm region. The study evaluates the region's economic potential, the efficiency of resource utilization, and the key factors determining its competitive advantages. Furthermore, priority directions and practical recommendations aimed at enhancing regional competitiveness are developed.

Keywords: competitiveness, regional competitiveness index, agrotourism, industrial zone, regional competitiveness.

Introduction. Competitiveness is one of the fundamental economic categories within market relations, and it is formed at the levels of products, enterprises, industries, regions, and countries. In the context of increasing interdependence and interconnection of economic processes, regional competitiveness occupies a distinct and important place within the hierarchy of competitiveness [1].

Today, regional competitiveness is considered a key factor in the development of regional economies. In the Republic of Uzbekistan, enhancing the economic potential of regions, reducing interregional disparities, and enabling each region to develop its own competitive advantages are among the priority objectives of state policy.

The Khorezm region, located in the northwestern part of Uzbekistan, is distinguished by its rich historical and cultural heritage, agricultural potential, and tourism opportunities. Analyzing the region's economic development and identifying ways to enhance its competitiveness constitute a relevant scientific and practical task.

Main Part. The concept of competitiveness is one of the most important and extensively studied categories in economic science. In a market economy, competitiveness is a necessary condition for the successful functioning of any economic entity [2].

Various definitions of competitiveness exist in the economic literature. According to Michael Porter, competitiveness is the ability to withstand competition with other

analogues. At the regional level, this concept reflects the ability of a region to efficiently utilize its existing factors of production, apply current competitive advantages, and create new ones.

Regional competitiveness is defined as the productivity with which a region utilizes its territorial resources—primarily labor and capital—compared to other regions. It is reflected in the level and dynamics of gross regional product (GRP) per capita [3].

The main factors ensuring regional competitiveness can be classified as follows: natural resource factors (land, water, climate, minerals); infrastructure factors (transport, energy, communications); human capital (education, health, skills); institutional factors (tax policy, legal environment, government support); and scientific and technological potential (innovation, technologies).

In leading countries of the world, various indices and rankings are used to assess regional competitiveness. In particular, the Regional Competitiveness Index (RCI) developed by the European Union covers economic performance, labor markets, innovation, institutional environment, and other factors [4].

The Khorezm region is one of the regions in Uzbekistan that has experienced significant acceleration in its socio-economic development in recent years. The region stands out for its industrial sector, agricultural capacity, and tourism potential.

In the structure of Gross Regional Product (GRP), the share of agriculture, forestry, and fisheries accounts for 34.8%, the share of the industrial sector (including construction) is 24.9%, and the share of the services sector is 40.3%. These indicators demonstrate that the regional economy is diversified; however, the agricultural sector still retains significant importance [5].

The competitive advantages of the Khorezm region can be analyzed based on Porter's Diamond Model: **Factor Conditions**. The region has an adequate supply of labor resources. As of January 1, 2026, the population of the region amounts to 2,069,220 people. There are 27,729 enterprises and organizations operating in the region. In the field of education, more than 40 branches of higher education institutions and training centers are functioning in the region. **Demand Conditions**. The purchasing power of the regional population is increasing. In 2024, retail trade turnover increased by 109.7% compared to 2023. The services sector recorded a growth rate of 115.2%. **Related and Supporting Industries**. A cluster of agriculture and related service industries is being formed in the region. The agro-industrial complex, food industry, and agricultural machinery repair sectors are developing. **Firm Strategy, Structure, and Rivalry**. Entrepreneurial activity in the region is developing rapidly. There are 23,748 small business entities operating. State programs to support entrepreneurship are being implemented.

The following problems and barriers exist in improving the competitiveness of the Khorezm region [6]: Limited availability of mineral resources and insufficient industrial raw material base; Underdeveloped transport infrastructure and large distances between the regional center and other territories; Low level of industrial diversification and insufficient number of enterprises for processing agricultural products; Shortage of qualified personnel and labor migration; Low level of innovative activity and insufficient investment in research and development; Underdeveloped tourism infrastructure.

Improving the competitiveness of the Khorezm region involves the following key directions:

1. Development of the agro-industrial complex. It is necessary to establish deep processing enterprises for agricultural products in the region, expand the production of export-oriented agricultural goods, and introduce modern irrigation systems. There are opportunities to develop aquaculture in Bogot district and expand poultry farming in Qo'shko'pir district.
2. Development of tourism potential. The inclusion of the city of Khiva in the UNESCO World Heritage List creates significant opportunities for tourism development. It is necessary to develop agro-tourism, eco-tourism, and cultural-historical tourism, as well as improve hotel and restaurant services.
3. Development of industrial zones. It is planned to transform 175 hectares of land in Qo'shko'pir district into an industrial zone and establish new enterprises in the fields of electrical engineering, chemicals, mechanical engineering, and pharmaceuticals. This will create opportunities for 2,000 new jobs.
4. Improvement of infrastructure. It is necessary to develop transport communications, repair roads connecting the region with other territories, and establish modern logistics centers. By reducing the protected zone of the Shovot Canal, projects worth 30 million USD can be implemented.
5. Development of human capital. It is essential to improve the quality of education, train qualified personnel, ensure employment, and develop the healthcare system. It is planned to renovate 44 schools and kindergartens and establish new medical centers.

Conclusion. Based on the conducted research, the theoretical foundations of the concept of regional competitiveness and the economic potential of the Khorezm region were analyzed. The following main conclusions were drawn:

- Regional competitiveness is the ability of a region to efficiently use resources, create and maintain competitive advantages compared to other regions. It is a multi-component concept encompassing economic, social, institutional, and other factors.

- The Khorezm region has competitive advantages due to its agricultural potential, historical and cultural heritage, and labor resources. In 2024, the region maintained positive economic growth dynamics (GRP 107.9%, industry 108.4%, services 115.2%).
 - The region faces several challenges in improving its competitiveness, including a lack of mineral resources, underdeveloped transport infrastructure, and insufficient industrial diversification.
 - The main directions for improving competitiveness include developing the agro-industrial complex, effectively utilizing tourism potential, establishing industrial zones, improving infrastructure, and developing human capital.
 - It is planned to attract 1.5 billion USD in investments for the development of the region, which will serve as a basis for creating numerous new enterprises and jobs.
- Enhancing regional competitiveness is a long-term and complex process requiring a comprehensive approach. By effectively utilizing its natural and economic potential, the Khorezm region can become one of the most competitive regions of Uzbekistan.

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TEACHING AND IMPROVING FOOTBALL TECHNIQUES OF 13–14-YEAR-OLD SCHOOLCHILDREN ON THE BASIS OF DEVELOPING LEADING PHYSICAL QUALITIES

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Abstract: The article examines the methodological foundations for teaching and improving football techniques among 13–14-year-old schoolchildren through the targeted development of leading physical qualities. Special attention is given to the integration of speed, strength, endurance, agility, and coordination into the technical training process. The study justifies that a comprehensive and systematic approach significantly enhances technical performance and overall athletic development in young football players.

Keywords: football training, physical qualities, adolescents, technique improvement, coordination, motor skills

Introduction: In modern football, the effectiveness of a player is determined not only by technical proficiency but also by the level of physical development. The training of young football players, particularly those aged 13–14, requires a scientifically grounded and pedagogically structured approach.

This age period is characterized by rapid growth, increased functional capabilities, and high neuroplasticity, making it especially favorable for developing motor skills and technical abilities. Therefore, combining physical conditioning with technical training is essential for achieving optimal results.

Literature Review Research in the field of sports science indicates that the development of physical qualities plays a crucial role in mastering sports techniques. Scholars emphasize that:

- Speed and agility are closely linked to dribbling and ball control
- Strength contributes to shooting power and physical duels
- Endurance ensures consistent performance during matches

Modern training methodologies recommend an integrated approach where physical and technical components are developed simultaneously rather than separately.

Characteristics of 13–14-Year-Old Athletes

At this stage of development:

- The nervous system is highly adaptable
- Coordination abilities improve rapidly
- There is increased capacity for learning complex motor skills

However, training must consider:

- Individual differences in physical development
- Risk of overloading
- Need for motivation and engagement

Methodology

1. Integrated Training Approach

The training process should combine technical skills with physical exercises:

- Dribbling at high speed
- Passing under pressure
- Shooting after physical exertion

2. Principle of Progression

Training should follow a gradual increase in complexity:

- Simple → complex exercises
- Slow → fast execution
- Individual → group tasks

3. Game-Oriented Method

Using small-sided games enhances learning efficiency:

- Encourages decision-making
- Simulates real match conditions
- Improves tactical thinking

Development of Leading Physical Qualities

Speed Short sprints (10–30 meters)

- Reaction drills
- Acceleration exercises

Strength Bodyweight exercises (squats, lunges)

- Jump training
- Core stability exercises

Endurance Interval running

- Small-sided games with continuous movement

Agility and Coordination Ladder drills

- Cone drills
- Balance exercises with the ball

Practical Application in Training

Exercise 1: Speed Dribbling Players dribble the ball through cones at maximum speed. Objective: improve speed and ball control.

Exercise 2: Dynamic Passing Players pass the ball while constantly moving and changing positions. Objective: improve accuracy and coordination.

Exercise 3: Shooting Under Fatigue Players perform a sprint followed by a shot on goal. Objective: enhance shooting accuracy under physical stress.

Exercise 4: Small-Sided Game (4v4)

Reduced-field matches with specific conditions. Objective: develop technique, decision-making, and teamwork.

Results and Discussion The integration of physical qualities into technical training leads to:

- Improved technical execution under pressure
- Faster decision-making
- Better match performance

Players trained using integrated methods demonstrate significantly higher efficiency compared to those trained with isolated approaches.

Conclusion The teaching and improvement of football techniques in 13–14-year-old schoolchildren should be based on the systematic development of leading physical qualities. An integrated and scientifically grounded training approach ensures effective skill acquisition and long-term athletic development.

Coaches should prioritize: Individualized training programs. Progressive load increase. Game-based learning methods

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THE EFFECT OF PANCREATIC JUICE ON THE MOTOR AND EVACUATORY FUNCTIONS OF THE STOMACH

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Annotation. This article discusses the anatomical structure of the stomach, the glandular cells in its mucous membrane and the substances from which they are produced, the pancreas and its location, the sphincter of Oddi and its location, the effect of pancreatic juice on the motor and evacuation functions of the stomach.

Key words: anatomical structure of the stomach, the pancreas and its location, the sphincter of Oddi, pancreatic juice, motor and evacuation functions of the stomach.

Аннотация. В этой статье рассматриваются анатомическое строение желудка, железистые клетки в его слизистой оболочке и вещества, из которых они вырабатываются, поджелудочная железа и ее расположение, сфинктер Одди и его расположение, влияние панкреатического сока на моторную и эвакуаторную функции желудка.

Ключевые слова. Строение желудка, слизистая оболочка желудка, слизистых клеток, желудочные железы, поджелудочная железа, сфинктер ОДДИ, моторные и эвакуаторные функции желудка.

Annotation. This article discusses the anatomical structure of the stomach, the glandular cells in its mucous membrane and the substances from which they are produced, the pancreas and its location, the sphincter of Oddi and its location, the effect of pancreatic juice on the motor and evacuation functions of the stomach.

Key words: anatomical structure of the stomach, the pancreas and its location, the sphincter of Oddi, pancreatic juice, motor and evacuation functions of the stomach.

Introduction

The stomach is an essential organ of the digestive system. It is a muscular organ resembling a curved hook, although its shape may vary. The stomach is located in the abdominal cavity at the level of the 11th thoracic vertebra. It is directly connected superiorly to the esophagus and inferiorly to the duodenum. Its volume ranges from 1 to 3 liters, depending on the degree of filling and the tension of its walls.

Anatomical Structure of the Stomach

The stomach consists of four parts: the cardia (inlet), body, fundus, and pyloric (outlet) part. The cardia connects the stomach with the esophagus, while the pyloric region connects it with the duodenum.

At the cardiac region, there is a sphincter that allows the passage of liquids and semi-digested food and prevents the reflux of gastric contents into the esophagus. In the pyloric region, the pyloric sphincter regulates the passage of digested food into the duodenum and prevents its backflow.

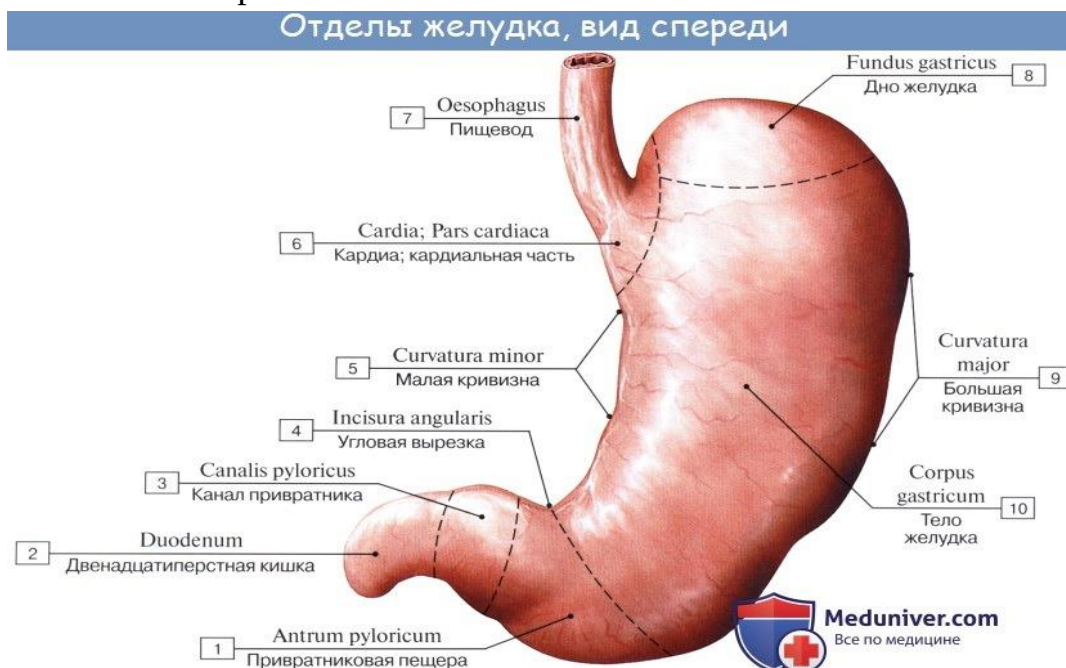


Figure 1. Structure of the stomach

Structure of the Gastric Wall

The stomach wall is composed of four layers: mucosa, submucosa, muscular layer, and serosa.

- The **mucosa** contains glandular cells responsible for the secretion of gastric juice.
- The **submucosa** contains blood vessels and nerve fibers and connects the mucosa with the muscular layer.
- The **muscular layer** consists of inner circular, middle oblique, and outer longitudinal muscle fibers.
- The **serosa** forms the outer protective layer.

The glandular cells of the gastric mucosa are divided into three types:

- **Chief cells** – produce pepsinogen
- **Parietal cells** – secrete hydrochloric acid
- **Mucous cells** – produce mucus

Together, these secretions form gastric juice.

Composition and Function of Gastric Juice

Gastric juice is a colorless, transparent, acidic liquid. It contains hydrochloric acid, mineral salts, and enzymes (primarily pepsin). The concentration of hydrochloric acid in human gastric juice is approximately 0.4–0.5%.

Hydrochloric acid plays a crucial role in digestion by:

- softening and breaking down food,
- activating digestive enzymes,
- destroying microorganisms,
- stimulating pancreatic secretion,
- promoting the formation of digestive hormones.

Mucus secreted by accessory cells neutralizes excess acidity, protects the mucosa, and facilitates digestion.

Food may remain in the stomach for 3 to 8–10 hours, during which it is gradually processed and passed into the duodenum.

The stomach possesses both motor and evacuatory functions. The contraction of smooth muscle fibers in the gastric wall ensures the motor function, that is, the movement function of the stomach. Its primary role is to mix the ingested food and facilitate its passage from the stomach into the intestine. The pyloric sphincter plays a crucial role in regulating the transfer of food into the intestine.

Due to contractions of the gastric muscles, food passes from the stomach into the intestine. The rate at which food leaves the stomach depends on its composition. As a result of the interaction between the mucous membrane of the gastric outlet and hydrochloric acid present in gastric juice, the pyloric sphincter opens. At this moment, a portion of the gastric contents enters the duodenum, causing the normally alkaline environment there to become temporarily acidic.

The acid then acts on the mucous membrane of the duodenum, triggering a reflex contraction of the pyloric muscles, which leads to closure of the sphincter. Consequently, the passage of food from the stomach into the duodenum is temporarily halted. Under the influence of secretions such as pancreatic juice, intestinal juice, and bile, the acid is neutralized, and the intestinal environment returns to an alkaline state, after which the process resumes.

Since digestion in the intestine takes a relatively long time, the restoration of an alkaline environment ensures that a new portion of food enters the intestine only after the previous portion has been sufficiently processed. The closure of the pyloric opening in response to hydrochloric acid entering the duodenum is known as the **pyloric reflex**.

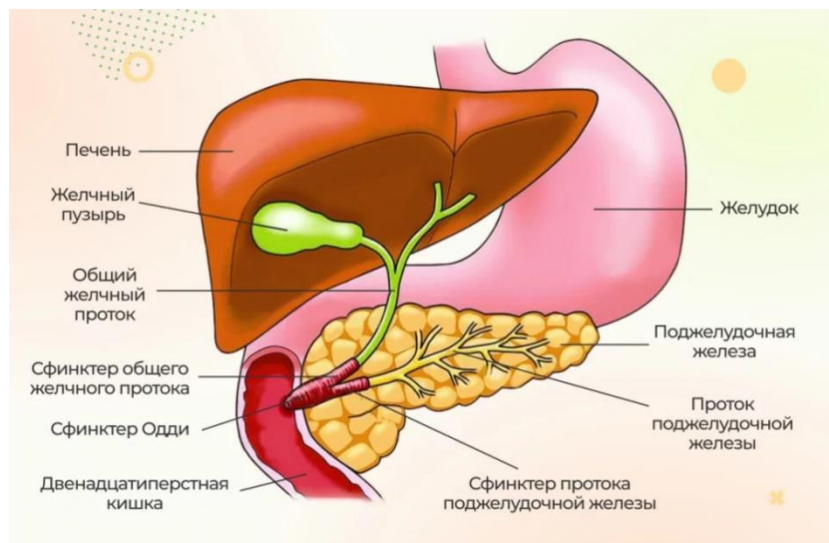


Figure 3. Structure of the pancreas

Experimental Studies

Physiologists G.F. Korotko, A.N. Aripov, and G. Askhanov (1990) conducted scientific research in the field of digestive physiology. They investigated the motor and evacuatory functions of the stomach under conditions where the pancreatic duct was surgically relocated. In these experiments, the effect of pancreatic juice on gastric motor and evacuatory functions was studied.

The experiments were mainly carried out on dogs. Initially, a Basov fistula was surgically created in the stomach. Then, gastric motor activity under fasting conditions was recorded using a balloonographic method. In the empty stomach of the dog, cycles of contractions appeared approximately every 1.5 hours. Each contraction period lasted 15–20 minutes and was followed by a resting phase.

Subsequently, gastric evacuatory function was studied under the same conditions. For this purpose, 0.2% hydrochloric acid (HCl) and 0.2% sodium bicarbonate solutions were used. In each experiment, 200 ml of the solutions were introduced into the stomach through the fistula. The rate of evacuation was measured every 10 minutes.

Under normal conditions, it was found that hydrochloric acid was evacuated significantly more slowly than the alkaline solution. This is because acid strongly stimulates the mucous membrane of the duodenum, triggering the pyloric reflex, which keeps the pyloric sphincter closed until the pH in the duodenum returns to neutral.

In the next stage, a 0.2% sodium bicarbonate solution was introduced, and its evacuation rate was also measured at 10-minute intervals. The evacuation of sodium bicarbonate occurred more rapidly, as the duodenal environment remained alkaline.

The same experiment was repeated after surgically relocating the pancreatic duct 30 cm into the jejunum. This constituted the second stage of the study. In this case, pancreatic juice did not enter the duodenum.

As a result:

- Gastric motility increased by approximately 1.5 times compared to normal conditions.
- Changes in evacuatory function were also observed.
- The evacuation of sodium bicarbonate slowed down.
- The evacuation of hydrochloric acid accelerated.

These findings indicate that when pancreatic juice, which performs a neutralizing function, does not enter the duodenum, it negatively affects both the motor and evacuatory functions of the stomach.

Conclusion

Pancreatic juice, intestinal juice, and bile entering the duodenum play a crucial role in regulating the motor and evacuatory functions of the stomach.

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THE PHILOSOPHICAL ESSENCE OF ILLNESS AND HEALTH

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Abstract: This article explores the philosophical essence of illness and health as fundamental categories in medical science and human existence. Health and disease are not only biological conditions but also complex phenomena shaped by social, psychological, cultural, and ethical dimensions. The study analyzes various philosophical perspectives on health and illness, including biomedical, holistic, and existential approaches. Special attention is given to the understanding of health as a dynamic state of physical, mental, and social well-being, and illness as a disruption of harmony within the individual and between the individual and society. The paper also highlights the role of values, perception, and human experience in defining these concepts. The findings suggest that integrating philosophical insights into medical education can enhance clinical thinking, improve doctor–patient relationships, and promote a more humanistic approach to healthcare.

Keywords: health, illness, philosophy of medicine, holistic approach, biomedical model, well-being, human experience, ethics, doctor–patient relationship, medical anthropology, healthcare, existential perspective

Introduction

Health and illness are among the most fundamental concepts in medicine, yet their meanings extend far beyond purely biological definitions. Throughout history, these concepts have been interpreted not only in scientific terms but also through philosophical, cultural, and ethical perspectives. While modern medicine often focuses on the physiological aspects of disease, a deeper understanding of health and illness requires an interdisciplinary approach that includes philosophy, sociology, and psychology. Traditionally, the biomedical model has defined health as the absence of

disease and illness as a deviation from normal biological functioning. However, this approach has been increasingly criticized for its limitations, as it tends to overlook the subjective and social dimensions of human health. In contrast, the holistic perspective views health as a state of complete physical, mental, and social well-being, emphasizing the interconnectedness of the body, mind, and environment. From a philosophical standpoint, health can be understood as a state of balance, harmony, and functional integrity, while illness represents a disruption of this equilibrium. Philosophers and medical theorists have long debated whether health is merely a natural biological state or a value-laden concept influenced by cultural norms and individual perceptions. This debate highlights the complexity of defining what it means to be “healthy” or “ill.” Moreover, illness is not only a physiological condition but also a personal and social experience. It affects an individual’s identity, behavior, and interaction with others. The way a person perceives illness can influence their response to treatment, recovery process, and overall quality of life. Therefore, understanding illness requires attention to both objective medical indicators and subjective human experiences. In contemporary healthcare, there is a growing recognition of the need to integrate philosophical insights into medical practice.

Materials and Methods

This study is based on a qualitative, interdisciplinary research design aimed at exploring the philosophical essence of health and illness. The methodological framework integrates concepts from philosophy of medicine, medical ethics, psychology, and sociology to provide a comprehensive understanding of the subject. The research materials include classical and modern philosophical texts, medical literature, and international health definitions, particularly those related to the concept of health as defined by global health organizations. Works of prominent philosophers and medical theorists concerning the nature of disease, well-being, and human existence were also analyzed. In addition, contemporary academic articles focusing on the biomedical and holistic models of health were reviewed. The following research methods were applied: Philosophical analysis – to examine different theoretical interpretations of health and illness, including biomedical, holistic, and existential perspectives. Comparative method – to compare traditional and modern approaches to defining health and disease. Descriptive method – to outline the conceptual and semantic characteristics of key terms related to health and illness. Hermeneutic method – to interpret philosophical texts and understand deeper meanings related to human experience and perception of illness. Systematic literature review – to synthesize findings from various disciplines and identify common themes and contradictions.

Results

The results of the study reveal that health and illness cannot be fully understood within the limits of a purely biomedical framework. While the biomedical model provides a clear and measurable definition of disease based on physiological abnormalities, it fails to capture the subjective, psychological, and social dimensions of human well-being. The analysis shows that the holistic approach offers a more comprehensive understanding of health by considering the interaction between physical, mental, and social factors. Health is identified not merely as the absence of disease but as a dynamic state of balance and harmony within the individual and between the individual and their environment. Furthermore, the findings indicate that illness is a multidimensional phenomenon that includes both objective pathological processes and subjective human experiences. Patients often perceive illness differently depending on their cultural background, personal beliefs, and emotional state. This subjective dimension significantly influences treatment outcomes and patient satisfaction. The study also highlights the importance of philosophical perspectives, particularly existential and phenomenological approaches, in understanding illness as a lived experience. These perspectives emphasize the role of individual perception, meaning, and identity in shaping the experience of being ill.

Discussion

The findings of this study support the growing recognition that health and illness are complex, multidimensional concepts that require more than a purely scientific explanation. The limitations of the biomedical model, as identified in this research, are consistent with critiques in contemporary medical philosophy, which argue for a more holistic and human-centered approach to healthcare. One of the key implications of this study is the importance of considering the subjective experience of patients. Illness is not only a biological dysfunction but also a personal and social reality that affects an individual's sense of self, relationships, and quality of life. Therefore, effective medical practice must address both the physical and existential dimensions of health.

Conclusion

In conclusion, the philosophical analysis of health and illness reveals that these concepts are far more complex than simple biological conditions. Health cannot be reduced to the mere absence of disease, and illness cannot be understood solely as a physiological dysfunction. Instead, both are multidimensional phenomena that encompass biological, psychological, social, and existential aspects of human life. The study demonstrates that the biomedical model, while essential for diagnosis and treatment, is limited in its ability to fully capture the human experience of illness. In contrast, holistic and philosophical approaches provide a deeper understanding by emphasizing balance, well-being, and the subjective perception of health. Illness, from

this perspective, is not only a disruption of bodily functions but also a meaningful experience that affects a person's identity, values, and interaction with the world. Furthermore, the integration of philosophical perspectives into medical education and practice enhances the development of critical thinking, ethical awareness, and empathy among healthcare professionals. This contributes to more effective doctor–patient relationships and improves the overall quality of care. Despite certain challenges in applying philosophical approaches in clinical settings, their importance in shaping a humanistic and patient-centered healthcare system is undeniable. Therefore, a balanced integration of scientific and philosophical knowledge is essential for the advancement of modern medicine.

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PHYTOPATHOGENIC VIRUSES AND THEIR IMPORTANCE IN THE NATIONAL ECONOMY

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Annotation: phytopathogenic viruses are one of the main disease triggers in plants, dramatically reducing the yield and product quality of agricultural crops. Worldwide, these viruses cause us \$ 30 billion in annual damage. Their distribution occurs through vectors (aphids, oozes), mechanical pathway, seed, and soil.

In Uzbekistan, it is common in important crops such as potatoes, tomatoes, Acorns, onions and cucumbers, among others, leading to a loss of up to 30-100% of the crop. The paper covers the structure, classification, mechanisms of transmission, symptoms, economic harm, and modern control methods of viruses extensively scientifically. As a result, it has been argued that harm can be prevented in the national economy through integrated protective measures. It is possible to ensure food safety by enhancing research and quarantine measures.

Keywords: phytopathogenic viruses, viral diseases, agricultural damage, vector transmission, productivity losses, resistant varieties, CRISPR/Cas9, integrated control, Agriculture of Uzbekistan.

Introduction viruses have a special place in biology: they are cell-free and multiply only in living cells. Phytopathogenic viruses were discovered as a plant-infecting group by Dmitry Ivanovsky in 1892 and Martin Beijerinck in 1898 using the example of tobacco mosaic virus (TMV). Currently, more than 1,000 phytovirus species have been identified, damaging more than 400 plant families.

Plant viruses disrupt photosynthesis, nutrient metabolism, and growth processes, causing the plant to become stunted, leaf deformation, and reduced yield quality.

Viral diseases are a major economic problem in the national economy, in particular in the Agriculture of Uzbekistan (potatoes, tomatoes, Acorns, wheat, onions and fruit crops. While global annual losses are \$ 30 billion, the rate is even higher in developing countries, including Central Asia. This article is devoted to the extensive coverage of the scientific basis of phytopathogenic viruses and their place in the national economy.

Main part. The structure and classification of phytopathogenic viruses consists of nucleic acid (often RNA, in some DNA) surrounded by phytopathogenic virus protein

shells (capsid). The size is 17-730 nm, the shape is rod – shaped (TMV-300×15 nm), thread-shaped or multifaceted. The classification is divided into 20 groups according to the Gibbs and Harrison (1978) system: depending on the type of nucleic acid, the spreading insect and the host of the plant.

The main families are Potyviridae (PVY), Geminiviridae (TYLCV), Closteroviridae (Citrus tristeza virus), etc.

Species such as TMV, PVY, Potato leafroll virus (PLRV) are common in Uzbekistan.

Ways of spreading viruses spread in the following ways:

By Vector: aphids (nonpersistent-PVY, persistent-PLRV), oqqanot (*Bemisia tabaci-tylcv*), trips (Tomato spotted wilt virus).

Mechanical: by Tools, hands, welding (TMV).

By seed and dust: in 20% of cases (some mosaic viruses).

Soil and nematodes: nematodes (*Xiphinema* spp.) through.

Vegetative propagation: through potato nodules. In the conditions of Uzbekistan, vectors (aphids) play a key role in the greenhouse and open fields.

Symptoms of the disease viral infection cause the following symptoms: mosaic (yellow-green spots on the leaves – TMV, PVY), chlorosis and yellowing, leaf twisting and grinding, necrosis and spotting, stunting of the plant, fruit deformation and reduced yield. For example, in potatoes, PVY causes nodule necrosis (PTNRD); in tomatoes, TYLCV causes leaf twisting and 100% loss of yield. In greenhouse conditions (32-35°C), symptoms increase. The importance of phytopathogenic viruses in the national economy is directly (crop loss) and indirectly (decreased quality, rot in storage) harmful to agriculture. Worldwide, annual damage is estimated at \$ 30 billion .

In Uzbekistan, potato viruses (PVY, PLRV, PVC) reduce yield by 30-59%; in tomatoes and acorns, tylcv and Mosaic viruses cause significant damage.

This affects food security, exports and farmer income. Climate change and new strains (recombination) are leading to increased damage.

Since control and prevention methods are impossible to treat, prevention is the main: Exclusion and quarantine: healthy seeds and seedlings, quarantine measures.

Thawing and Prevention: eradication of infected plants (roguing), weed control.

Vector control: insecticides, biological agents, reflexive mulch.

Thawing and Prevention: eradication of infected plants (roguing), weed control.

Genetic resistance: resistant varieties (eIF4E genes), CRISPR/Cas9 and RNAi technologies (dsRNA spray – GMO-free method).

Diagnostics: NGS (next-generation sequencing) and ELISA. In Uzbekistan, agrotechnics (sowing dates, fertilizers), thermotherapy and antibiotics (imanin) are effective. Integrated pest management (IPM) gives the best results.

Conclusion: Phytopathogenic viruses are a major threat to the national economy, causing significant economic damage on a global and national scale. Viruses significantly reduce yields in Uzbek agriculture, particularly in potato, vegetable, and cotton crops. Modern technologies (CRISPR, RNAi) and integrated control can prevent damage. Future research into diagnostics, development of resistant varieties, and adaptation to climate change will be essential. These measures will ensure food security and strengthen the national economy.

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ПРЕЭКЛАМПСИЯДА ЛИМФА ТУГУНЛАРИНИНГ МОРФОЛОГИК ВА МОРФОМЕТРИК ЎЗГАРИШЛАРИ

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Долзарблиги: Преэклампсия ҳомиладорликнинг энг оғир асоратларидан бири бўлиб, она ва перинатал ўлимнинг муҳим сабабларидан ҳисобланади. Замонавий қарашларга кўра, преэклампсияда иммун тизим, айниқса лимфа тугунларининг барьер-филтрация ва детоксикация функцияларида чуқур ўзгаришлар кузатилади. Шу боис, лимфа тугунларининг морфологик ва морфометрик хусусиятларини ўрганиш касаллик патогенезини чуқур англашда муҳим аҳамиятга эга.

Тадқиқот мақсади: Преэклампсияда трахеобронхиал ва мезентериал лимфа тугунларининг морфологик ва морфометрик ўзгаришларини аниқлаш.

Материал ва усуллар: Тадқиқот 2015–2021 йиллар давомида Ўзбекистон Республикаси Соғлиқни сақлаш вазирлиги Республика патологик анатомия марказида ўтказилди. Аутопсия жараёнида ҳомиладорликнинг иккинчи ярмида преэклампсия асоратларидан вафот этган 44 нафар аёлдан трахеобронхиал ва мезентериал лимфа тугунлари ажратиб олинди. Назорат гуруҳи сифатида соматик экстрагенитал касалликлардан вафот этган 14 нафар аёлнинг лимфа тугунлари ўрганилди. Клиник-анамнестик маълумотлар таҳлил қилиниб, преэклампсиянинг ўрта оғир, оғир ва эклампсия шакллари фарқланди. Морфологик тадқиқотлар гистологик усуллар орқали, морфометрик таҳлил эса лимфоид фолликулалар, паракортикал майдон ва синуслар ўлчамларини баҳолаш асосида амалга оширилди.

Тадқиқот натижалари: Клиник таҳлил натижаларига кўра, ўлим кўрсаткичи оғир преэклампсияда 44,8%, эклампсияда 17,2% ва ўрта оғир шаклда 13,8% ни ташкил қилди. Беморларнинг ўртача ёши $32,4 \pm 2,6$ йил бўлиб, асосий хавф омиллари сифатида артериал гипертензия (85,4%), семириш (74,6%) ва иккинчи даражали қандли диабет (36,3%) аниқланди.

Трахеобронхиал лимфа тугунларида пўстлоқ қават кенгайган, мағиз қавати тор, паракортикал соҳа сегментар тарзда жойлашган. Преэклампсияда лимфоид фолликулалар атрофияси, паракортикал зонанинг сийраклашиши, посткапилляр венулаларнинг қайта тузилиши ва синусларнинг торайиши кузатилди.

Мезентериал лимфа тугунларида ташқи капсула юпқалашган, субкапсуляр синуслар кенгайган, пўстлоқ қавати энсизлашган. Преэклампсия таъсирида лимфа тугунларда дистрофик ва атрофик жараёнлар устун бўлиб, лимфоид фолликулаларда некробиотик ўзгаришлар ва секвестрация ҳолатлари қайд этилди. Барьер-филтрация функциясини таъминловчи гистиоцитлар ва ретикуляр ҳужайралар пролиферацияси кучайгани аниқланди. Строма-томир компонентларида пролиферация ва қайта тузилиш жараёнлари кузатилиб, бу детоксикация функциясининг компенсатор кучайиши сифатида баҳоланди.

Хулоса:

Преэклампсия лимфа тугунларида чуқур морфологик қайта қурилишларга олиб келади. Бу ўзгаришлар лимфоид тўқиманинг атрофияси ва некробиоз, синуслар архитектурасининг бузилиши ҳамда стромал-томир компонентлар пролиферацияси билан характерланади. Аниқланган морфологик ва морфометрик ўзгаришлар преэклампсияда иммун тизим дисфункцияси ва эндотоксикоз ривожланишининг морфологик асосини ташкил этади.

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