INTRAUTERINE MALNUTRITION

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Purpose of the work:

The purpose of this work is to analyze the pathological mechanisms, clinical manifestations, epidemiological trends, and long-term consequences of intra-uterine malnutrition (Intra-Uterine Growth Restriction — IUGR), with a focus on global and regional statistical data. This thesis also aims to highlight diagnostic approaches, preventive strategies, and the pharmacological and non-pharmacological interventions used to reduce perinatal morbidity and mortality associated with IUGR. With an emphasis on global and regional statistics and the implication for neonatal and life long health.

Materials and research methods:

research methodology incorporates a critical analysis of recent studies global public health data, and neonatal outcome statistics. Statistical data is derived from World Health Organization (WHO), UNICEF, and published research evaluating the prevalence of intrauterine growth restriction (IUGR) and low birth weight (LBW) in developed and developing countries, including Uzbekistan

The study is based on:

1. Epidemiological Data:

WHO datasets (2019–2024 updates), UNICEF global nutrition reports, and national health and statistics from Uzbekistan, Kazakhstan, India, and European maternal health registries.

2. Clinical Materials:

42 clinical case summaries from regional perinatal centers

Review of pathological specimens documenting placental insufficiency, chronic fetal hypoxia, and maternal metabolic syndromes.

3. Research Methods:

Descriptive and analytical epidemiology.

Histopathological analysis of placenta and fetal tissues.

Doppler ultrasound data review, statistical analysis

Results:

Prevalence and Global Statistics :

Low birth weight (LBW, <2500 g) affects 16.4% of all newborns globally, amounting to approximately 20.5 million infants per year.

In developing countries, the prevalence of LBW can reach 11% of all births, with rates up to six times higher than in high-income countries

IUGR, defined as birth weight below the 10th percentile, affects about 23.8% of newborns in developing countries approximately 30 million per year

Pathophysiological Mechanisms:

Intra-uterine malnutrition develops due to multiple interacting factors:

a. Placental Insufficiency

Reduced maternal–fetal blood flow

Thickening of placental basement membrane

Fibrosis and villous hypoplasia

These changes lead to chronic fetal hypoxia and insufficient nutrient transfer.

b. Maternal Factors

Malnutrition and anemia (iron deficiency rates in pregnant women globally: 29%)

Hypertension and pre-eclampsia

Infections (TORCH, malaria)

Metabolic conditions (diabetes, thyroid disorders)

c. Fetal Factors:

Chromosomal anomalies, Congenital infections, Genetic syndromes

3. Clinical Manifestations:

Low birth weight (<2500 g), Disproportionate head-body ratio, Reduced subcutaneous fat, Thin umbilical cord,Foetal distress during labor, Meconium-stained amniotic fluid, Hypoglycaemia, hypothermia, and respiratory distress after birth

Conclusions:

The burden of intrauterine malnutrition and its pathological consequences is profound, especially in resource-limited settings where rates far exceed recommended action thresholds. Early identification and public health intervention programs are critical for prevention and mitigation of IUGR, improving both perinatal survival and lifelong health outcomes.

1. Intra-uterine malnutrition remains a major obstetric and pediatric challenge, with significant contributions from maternal, environmental, and placental factors.
2. Central Asian countries, including Uzbekistan, maintain moderate IUGR prevalence, primarily linked to maternal anemia and hypertensive disorders.
3. Early detection using ultrasound and Doppler methods significantly reduces perinatal mortality.
4. Placental pathology is central to understanding and preventing IUGR, highlighting the need for improved maternal health programs.
5. Pharmacological interventions, particularly aspirin prophylaxis, heparin (in indicated cases), and micronutrient support, show proven efficacy.
6. Strengthening maternal nutrition programs, antenatal care, and public health policies can substantially reduce IUGR rates worldwide.