

LOW BIRTH WEIGHT INFANTS CAUSES OF PREMATURE BIRTH, MORPHOLOGICAL AND FUNCTIONAL CHARACTERISTICS

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Annotation. *This article discusses low birth weight infants and the causes, morphological characteristics, and functional features of premature birth. Prematurity and low birth weight remain major challenges in neonatal healthcare and are among the leading causes of neonatal morbidity and mortality worldwide. The study analyzes the maternal, fetal, and environmental factors associated with premature birth and examines the physical and physiological characteristics of low birth weight newborns. Particular attention is given to the immaturity of organ systems, including the respiratory, cardiovascular, digestive, nervous, and immune systems.*

The article also highlights the complications associated with prematurity and emphasizes the importance of early diagnosis, specialized neonatal care, and preventive measures. The findings demonstrate that comprehensive management and modern neonatal interventions significantly improve survival rates and long-term developmental outcomes in premature infants.

Keywords: *Premature birth, Preterm newborn, Neonatology, Neonatal care, Morphological characteristics, Functional immaturity, Neonatal complications, Infant development, Respiratory distress syndrome, Neonatal morbidity, Neonatal mortality.*

Introduction

Low birth weight infants and preterm newborns remain one of the most significant challenges in modern neonatology and public health. According to international medical data, premature birth and low birth weight are among the leading causes of neonatal morbidity and mortality worldwide. Infants born with low body weight are at increased risk of respiratory, neurological, cardiovascular, metabolic, and infectious complications, which may adversely affect their growth and development throughout childhood and even adulthood. Low birth weight is generally defined as a birth weight of less than 2500 grams, regardless of gestational age.

Premature birth refers to the delivery of an infant before 37 completed weeks of gestation.

Various maternal, fetal, placental, and environmental factors contribute to premature delivery and impaired fetal growth. Maternal infections, hypertension, diabetes, malnutrition, multiple pregnancy, smoking, and inadequate prenatal care are among the most common risk factors associated with preterm birth and low birth weight.

Premature infants demonstrate a number of characteristic morphological and functional features due to the immaturity of their organs and body systems. These newborns often have thin and delicate skin, reduced subcutaneous fat, poor muscle tone, underdeveloped reflexes, and difficulties in maintaining body temperature. Functional immaturity of the respiratory, digestive, nervous, and immune systems increases their vulnerability to various neonatal complications.

Consequently, early diagnosis and appropriate neonatal care are essential for improving survival and long-term health outcomes.

Understanding the causes of premature birth as well as the morphological and functional characteristics of low birth weight infants is crucial for healthcare professionals involved in maternal and neonatal care. Early identification of risk factors and implementation of preventive measures can significantly reduce neonatal complications and improve the quality of life of affected infants.

Relevance

Low birth weight and premature birth remain major problems in neonatal medicine and are among the leading causes of neonatal morbidity and mortality worldwide. Advances in modern healthcare have improved the survival rates of premature infants; however, complications associated with organ immaturity continue to pose significant medical and social challenges.

Infants born with low birth weight are more likely to experience respiratory disorders, infections, neurological impairments, growth retardation, and developmental difficulties compared to full-term newborns.

Aim

The objective of this study is to investigate the causes of premature birth and to analyze the morphological and functional characteristics of low birth weight newborns.

Main part

Low birth weight infants are newborns whose birth weight is less than 2500 grams regardless of gestational age. These infants represent a vulnerable group requiring special medical attention and monitoring. Based on birth weight, newborns are classified into low birth weight, very low birth weight, and extremely low birth weight categories. Very low birth weight refers to infants weighing less than 1500 grams, while extremely low birth weight includes infants weighing less than 1000 grams. Advances in neonatal medicine have improved survival rates among these infants; however, they remain at increased risk of complications. Birth weight is an important indicator of neonatal health and future development. Low birth weight may result from prematurity, intrauterine growth restriction, or both conditions simultaneously. Such infants often require specialized care immediately after birth. Their physiological adaptation to extrauterine life is frequently impaired because of organ immaturity. Accurate classification is essential for determining prognosis and treatment strategies. Healthcare professionals use birth weight categories to assess risks and provide individualized care. Understanding these classifications is important for improving neonatal outcomes. Early recognition of low birth weight infants allows timely medical interventions. Birth weight remains one of the most important indicators in neonatal assessment. Proper classification contributes significantly to effective management and long-term follow-up.

Premature birth occurs before the completion of 37 weeks of gestation and is influenced by numerous factors. Maternal health conditions play a significant role in the development of preterm labor. Hypertension, diabetes mellitus, anemia, and infectious diseases increase the risk of premature delivery. Multiple pregnancies such as twins or triplets are also associated with a higher incidence of preterm birth. Maternal malnutrition and poor prenatal care contribute to inadequate fetal growth and early delivery.

Lifestyle factors including smoking, alcohol consumption, and drug abuse negatively affect pregnancy outcomes. Psychological stress and excessive physical workload may also increase the risk of premature labor. Placental abnormalities, premature rupture of membranes, and uterine malformations are important obstetric causes. Genetic and environmental factors may further influence pregnancy duration. In some cases, the exact cause of premature birth remains unknown.

Early identification of risk factors is essential for implementing preventive measures.

Appropriate prenatal care can significantly reduce the incidence of preterm delivery. Public health interventions focused on maternal health are equally important. Understanding these risk factors helps healthcare providers develop effective prevention strategies.

Low birth weight and premature infants exhibit distinctive morphological characteristics due to incomplete fetal development. One of the most notable features is their small body size and low body mass. The skin is typically thin, delicate, and translucent because subcutaneous fat deposits are poorly developed. Blood vessels may be easily visible through the skin surface.

Premature infants often have a relatively large head compared to the rest of the body. The ears may appear soft and underdeveloped due to insufficient cartilage formation. Fine body hair known as lanugo is frequently present on the shoulders, back, and face. The muscles are poorly developed, resulting in decreased muscle tone and limited spontaneous movements. Fingernails and toenails may be short and incompletely formed. The external genitalia often demonstrate signs of immaturity. Breast tissue development is usually minimal. These physical characteristics reflect the degree of prematurity and developmental immaturity. Careful morphological assessment helps determine gestational age and clinical status. Healthcare providers use these features to evaluate neonatal maturity and plan appropriate care.

Premature infants exhibit functional immaturity of multiple organ systems. The respiratory system is often underdeveloped, leading to respiratory distress and difficulty maintaining adequate oxygenation. Surfactant deficiency is a common problem among premature newborns.

Cardiovascular adaptation after birth may also be impaired due to incomplete physiological maturation. The digestive system demonstrates reduced enzyme activity and poor feeding tolerance. Premature infants frequently experience difficulties with sucking, swallowing, and digestion. Their nervous system is immature, resulting in weak reflexes and reduced motor activity. Thermoregulation is often inadequate because of limited fat stores and immature temperature-control mechanisms. The immune system is also underdeveloped, making these infants highly susceptible to infections. Renal function may be compromised, affecting fluid and electrolyte balance. Metabolic instability can result in hypoglycemia and other complications.

Functional immaturity significantly increases the need for specialized neonatal care.

Continuous monitoring is essential for detecting and managing potential complications.

Advances in neonatal intensive care have greatly improved outcomes for premature infants. Nevertheless, functional immaturity remains a major challenge in neonatal medicine.

Low birth weight infants are at increased risk of numerous short-term and long-term complications. Respiratory distress syndrome is one of the most common and serious neonatal disorders in premature infants. Infections occur frequently due to an immature immune system.

Neurological complications such as intraventricular hemorrhage may lead to long-term developmental problems. Feeding difficulties often contribute to poor growth and nutritional deficiencies. Premature infants may experience jaundice, anemia, and metabolic disorders during the neonatal period. Vision and hearing impairments are also more common among low birth weight newborns. Growth retardation may persist throughout childhood if adequate medical care is not provided. Cognitive and behavioral difficulties can develop later in life. Chronic lung disease remains a significant complication in some premature infants. Cardiovascular abnormalities may also occur due to developmental immaturity. Long-term follow-up is essential for monitoring developmental progress and identifying potential problems. Early intervention programs can improve neurodevelopmental outcomes. Multidisciplinary care is often required to address complex medical needs. Understanding these complications is critical for reducing morbidity and mortality.

Preventing premature birth and improving the care of low birth weight infants are major priorities in neonatal healthcare. Regular prenatal care is essential for identifying and managing maternal risk factors. Proper maternal nutrition contributes significantly to healthy fetal growth and development. Screening and treatment of maternal infections can reduce the risk of preterm labor. Health education programs help pregnant women adopt healthier lifestyles. Advances in obstetric care have improved the prevention of premature delivery. Antenatal corticosteroid therapy enhances fetal lung maturation when preterm birth is anticipated. Modern neonatal intensive care units provide advanced respiratory and nutritional support for premature infants.

Kangaroo mother care has demonstrated significant benefits in improving survival and promoting bonding. Breastfeeding plays a vital role in protecting premature infants against infections and supporting growth. Continuous monitoring and developmental follow-up are essential components of long-term care. Technological innovations continue to improve neonatal outcomes worldwide.

Multidisciplinary collaboration among healthcare professionals enhances the quality of care. Public health initiatives aimed at maternal and child health contribute to reducing prematurity rates. Therefore, comprehensive prevention and management strategies are essential for ensuring better outcomes for premature and low birth weight infants.

Conclusion

In conclusion, low birth weight infants and premature newborns represent a high-risk group that requires specialized medical care and continuous monitoring. Premature birth remains one of the leading causes of neonatal morbidity and mortality worldwide, significantly affecting the health and development of infants. Various maternal, fetal, and environmental factors contribute to preterm delivery and low birth weight, highlighting the importance of effective prenatal care and preventive strategies. The study demonstrates that premature infants exhibit distinct morphological and functional characteristics resulting from the immaturity of their organs and body systems. These newborns are more vulnerable to respiratory, neurological, metabolic, and infectious complications, which may negatively influence both short-term survival and long-term developmental outcomes.

Early recognition of these characteristics is essential for timely diagnosis and appropriate clinical management. Advances in neonatal intensive care, nutritional support, and developmental follow-up have substantially improved the prognosis of low birth weight infants. Preventive measures, including proper maternal healthcare, adequate nutrition, early risk assessment, and specialized neonatal interventions, play a crucial role in reducing complications and improving quality of life. Therefore, comprehensive approaches aimed at the prevention, early diagnosis, and effective management of prematurity are essential for ensuring better health outcomes and promoting the well-being of future generations.

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