

SPECIFIC ASPECTS OF RICKETS DISEASE

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Abstract. Rickets is a skeletal disorder that primarily affects children, leading to weakened and deformed bones due to deficiencies in vitamin D, calcium, or phosphate. This article explores the specific aspects of rickets, including its causes, symptoms, diagnostic methods, treatment approaches, and prevention strategies. The condition can result from insufficient sunlight exposure, poor nutrition, genetic factors, or underlying medical conditions. The article also highlights the role of early diagnosis and proper management in preventing complications such as bone deformities, growth retardation, and fractures. Emphasis is placed on the importance of vitamin D supplementation, dietary adjustments, and lifestyle modifications to combat rickets effectively.

Keywords: Rickets, vitamin D deficiency, calcium metabolism, bone deformities, childhood disease, hypocalcemia, bone mineralization, prevention.

INTRODUCTION

Rickets is a disorder that affects bone development in children, leading to soft and weak bones, which can result in deformities and fractures. The condition is primarily caused by a deficiency of vitamin D, calcium, or phosphate, which are essential for bone mineralization. Although rickets is more common in children, a similar condition known as osteomalacia can occur in adults. Understanding the specific aspects of rickets, including its causes, symptoms, diagnosis, treatment, and prevention, is crucial in addressing this preventable disease [1].

MATERIALS AND METHODS

The main cause of rickets is insufficient vitamin D, which plays a crucial role in calcium and phosphate absorption. Several factors contribute to vitamin D deficiency:

Lack of Sunlight Exposure:

Vitamin D is synthesized in the skin when exposed to sunlight. Limited sun exposure due to geographical location, excessive use of sunscreen, or indoor lifestyles can lead to deficiency.

Nutritional Deficiencies:

A diet low in vitamin D, calcium, or phosphate can contribute to rickets. Infants who are exclusively breastfed without vitamin D supplementation are at risk since breast milk alone does not provide sufficient vitamin D.

Genetic Factors:

Some hereditary conditions, such as X-linked hypophosphatemic rickets, affect phosphate metabolism and lead to rickets despite adequate vitamin D intake.

Medical Conditions:

Disorders such as chronic kidney disease, liver disease, or malabsorption syndromes (e.g., celiac disease) can impair the body's ability to absorb or metabolize vitamin D and minerals.

Premature Birth:

Babies born prematurely have lower stores of vitamin D, making them more susceptible to developing rickets.

RESULTS AND DISCUSSION

Rickets manifests in several skeletal and systemic abnormalities, including:

Skeletal Deformities [2]:

Bowlegs (genu varum): A common sign in young children due to weak bones unable to support body weight properly.

Knock Knees (genu valgum): Sometimes seen in older children with rickets.

Delayed Closure of Fontanelles: The soft spots on an infant's skull may take longer to close.

Thickened Wrists and Ankles: The ends of bones enlarge due to abnormal growth.

Muscle Weakness and Pain:

Children with rickets often experience muscle weakness, making movement difficult.

Bone pain, particularly in the spine, pelvis, and legs.

Delayed Growth and Development:

Rickets can slow a child's growth, leading to shorter stature.

Delayed teething and poor enamel formation.

Neurological Symptoms:

Severe vitamin D deficiency can cause hypocalcemia (low calcium levels), leading to symptoms such as muscle spasms, seizures, and breathing difficulties.

To confirm a diagnosis of rickets, healthcare providers use a combination of clinical evaluation and diagnostic tests:

Physical Examination:

Checking for skeletal deformities, muscle weakness, and growth abnormalities.

Blood Tests:

Measuring levels of calcium, phosphate, and alkaline phosphatase (an enzyme that increases when bones are poorly mineralized).

Checking vitamin D levels to assess deficiency [3].

X-rays:

Imaging can reveal characteristic bone changes, including widened and irregular growth plates.

Bone Density Scans (DXA scan):

In some cases, bone mineral density is assessed to determine the extent of demineralization.

Genetic Testing:

Conducted if hereditary rickets is suspected.

Treatment of Rickets

The treatment of rickets focuses on correcting the underlying deficiencies and managing symptoms:

Vitamin D Supplementation:

The most effective treatment is administering vitamin D, either orally or via injection in severe cases.

Dietary Modifications:

Ensuring adequate intake of vitamin D-rich foods such as fish (salmon, mackerel), fortified dairy products, egg yolks, and mushrooms.

CONCLUSION

Rickets is a preventable and treatable disease that primarily results from vitamin D, calcium, or phosphate deficiencies. While its prevalence has decreased in developed countries due to fortification programs, it remains a concern in certain populations, particularly among children with limited sun exposure, poor nutrition, or underlying health conditions. Early detection, proper nutrition, and adequate sunlight exposure are key to preventing and managing rickets, ensuring healthy bone development and overall well-being.

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