

Clinical Features of Dental Diseases in Schoolchildren with Hypochromy Anaemi

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Abstract Hypochromic anemia is one of the most common hematologic disorders in children, often resulting from iron deficiency. This condition significantly affects various body systems, including oral health. The aim of this article is to explore the clinical features of dental diseases in school-aged children with hypochromic anemia. The study highlights the prevalence, manifestations, and the pathophysiological link between anemia and oral health disturbances, proposing approaches for early diagnosis and effective management. Iron deficiency anemia is one of the most prevalent nutritional disorders among children worldwide. It affects various physiological processes and has a significant impact on oral health. This study investigates the clinical features of dental diseases in school-aged children diagnosed with hypochromic anemia. Through clinical-epidemiological analysis and comparison with control groups, we assess the frequency and severity of dental issues such as caries, periodontal disease, and oral mucosal changes. The results underscore the need for integrated diagnostic and preventive strategies to manage oral health in anemic children.

Keywords Hypochromic anemia, Dental diseases, Schoolchildren, Oral health, Iron deficiency iron deficiency anemia, Dental caries, Gingivitis, Schoolchildren, Oral health, Pediatric dentistry

1. Introduction

Hypochromic anemia, primarily caused by iron deficiency, is prevalent among children, especially those of school age. It not only impacts general physical development and cognitive performance but also has specific implications for oral health [1]. Oral tissues, due to their high cellular turnover and vascular supply, are particularly susceptible to nutritional deficiencies. Understanding the relationship between hypochromic anemia and dental diseases can improve preventive care and treatment outcomes in pediatric dentistry [2].

Hypochromic anemia is characterized by reduced hemoglobin concentration and pale red blood cells. Iron deficiency impairs hemoglobin synthesis, leading to decreased oxygen delivery to tissues, including those in the oral cavity [3]. This hypoxia affects oral mucosa, salivary glands, and periodontal structures. Additionally, iron plays a critical role in enzymatic reactions and immune function, which, when deficient, predispose children to infections and delayed healing [4]. Children's health is a key indicator of the social and economic development of a nation [5]. Among the most common chronic conditions in childhood

is iron deficiency anemia (IDA), which is known to cause systemic effects including impaired immunity and developmental delay. Oral health is closely tied to systemic health, and IDA has been linked to an increased prevalence of dental diseases such as caries, periodontitis, and mucosal lesions. Despite advances in public health, IDA remains a significant challenge in developing regions, necessitating detailed investigations into its dental implications [6].

2. Materials and Methods

This study is based on a clinical analysis of 378 school-aged children (6 to 17 years) with confirmed iron deficiency anemia. Data were collected between 2020 and 2023 from the Pediatric Department of Urgench Medical Association, Khorezm Region. The children were divided into three groups: 30 healthy controls, 60 children with dental diseases only, and 60 children with both dental diseases and anemia. Exclusion criteria included systemic disorders such as diabetes and other chronic illnesses. Comprehensive dental examinations were conducted, including assessments of oral hygiene, caries index (DMFT), gingival inflammation (PMA index), and enamel development anomalies. Surveys were administered to evaluate children's knowledge and practices regarding oral hygiene.

3. Results and Discussion

Prevalence of Dental Diseases Among 378 anemic children, 311 (82.2%) had at least one dental disease. The most common conditions included dental caries (83%), chronic periodontitis (31%), catarrhal gingivitis (38%), enamel hypoplasia (11%), and high labial frenum attachment (27%). Malocclusions such as misaligned teeth (37%), deep bite (6%), and prognathism (8%) were also observed.

Oral Hygiene and Behavior Surveys revealed poor oral hygiene knowledge and practices among anemic children. Most had inadequate brushing habits, did not use fluoride toothpaste, and lacked awareness of dental disease prevention. Children from rural areas (62.9%) had particularly poor hygiene scores.

Clinical Indices Oral hygiene indices (Volodkina-Fedorova, API, Green-Vermillion) and PMA scores indicated significantly worse oral health in the anemic group compared to controls. Caries intensity in 6–10-year-olds was particularly high, with DMFT scores ranging from 2.54 ± 0.12 to 4.35 ± 0.21 . The ICDAS index showed carious lesions mainly on chewing and proximal surfaces, often without cavitation.

Emotional and Psychological State Using the OHRQL and Luscher tests, it was found that anemic children often experienced fear, anxiety, and emotional instability during dental visits [7]. This influenced cooperation and treatment outcomes.

Medical and Economic Relevance IDA complicates dental treatment outcomes and increases healthcare costs. Timely treatment of caries can prevent chronic periodontitis, potentially saving 112,340 UZS per tooth. With several affected teeth per child, early intervention reduces national health expenditures significantly.

4. Conclusions

Children with iron deficiency anemia are at significantly higher risk for various dental diseases due to compromised immunity, poor oral hygiene, and enamel mineralization defects. Dental professionals should be aware of the systemic background of these patients. A multidisciplinary approach, including pediatricians and hematologists, is necessary for effective management. Preventive programs should focus on improving oral hygiene knowledge and early detection in high-risk groups.

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