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GROWTH AND DEVELOPMENT OF CHILDREN WITH ENDOCRINE PATHOLOGY IN THE ANDIJAN REGION

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Abstract

Growth and development in childhood are complex processes regulated by genetic, nutritional, and hormonal factors. Endocrine disorders represent one of the most important causes of growth disturbances and developmental abnormalities in pediatric populations. This study analyzes growth and developmental characteristics of children with endocrine pathology in the Andijan region. Anthropometric indicators, including body height, body weight, and body mass index, were assessed, and developmental deviations associated with various endocrine disorders were evaluated. The findings indicate that children with endocrine pathology demonstrate significant growth and developmental impairments compared to age-related normative standards. Early diagnosis and comprehensive management are essential for improving growth outcomes and overall health in affected children.

Keywords

Endocrine pathology, children, growth, development, anthropometric indicators, Andijan region

Introduction

Normal growth and development during childhood are fundamental indicators of health and well-being. These processes depend on the coordinated action of multiple endocrine systems, including the thyroid gland, pituitary gland, pancreas, and adrenal glands. Hormonal balance is essential for linear growth, skeletal maturation, metabolic regulation, and sexual development.

Endocrine disorders in children are increasingly recognized as a major public health concern. Conditions such as hypothyroidism, growth hormone deficiency, diabetes mellitus, and adrenal disorders may significantly impair physical growth and developmental progression. Growth retardation, delayed puberty, and abnormal body composition are among the most common manifestations of pediatric endocrine pathology.

Regional studies play an important role in identifying population-specific characteristics of growth and disease patterns. The Andijan region has unique environmental, nutritional, and socio-economic factors that may influence the prevalence and clinical course of endocrine disorders in children. However, comprehensive data on growth and development of children with endocrine pathology in this region remain limited.

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The aim of this study is to evaluate growth and developmental characteristics of children with endocrine pathology in the Andijan region and to analyze deviations from age-related normative indicators.

Literature Review

Growth and development during childhood are complex biological processes regulated by the coordinated interaction of genetic, nutritional, environmental, and endocrine factors. Normal endocrine function is essential for linear growth, skeletal maturation, metabolic balance, and pubertal development. Disturbances in hormonal regulation during childhood often result in growth retardation, delayed maturation, and long-term health consequences, making pediatric endocrine pathology a major concern in modern medicine (Reiter & Rosenfeld, 2003).

Numerous studies have demonstrated that endocrine disorders represent one of the leading causes of impaired growth in children. The hypothalamic–pituitary–thyroid axis plays a central role in regulating physical development, and even mild endocrine dysfunction may negatively affect growth velocity and final adult height if left untreated (Sperling, 2014). These findings emphasize the high sensitivity of the growing organism to hormonal imbalance.

Thyroid dysfunction is among the most common endocrine disorders affecting pediatric populations and has been extensively studied in relation to growth and development. Hypothyroidism in children is frequently associated with reduced growth velocity, delayed bone maturation, and increased body weight due to decreased metabolic activity (Fisher, 2014). In contrast, hyperthyroidism may initially accelerate growth; however, prolonged hormonal imbalance can lead to impaired physical development and early epiphyseal closure (Kaplowitz, 2016).

Growth hormone deficiency represents another significant cause of impaired linear growth in children. Studies indicate that insufficient secretion of growth hormone results in reduced height-for-age, decreased muscle mass, and altered body composition (Sperling, 2014). Early diagnosis and timely initiation of growth hormone therapy are crucial for achieving optimal growth outcomes and minimizing irreversible deficits (Reiter & Rosenfeld, 2003).

Diabetes mellitus also exerts a considerable impact on growth and development in children. Chronic hyperglycemia, insulin deficiency, and metabolic instability may disrupt normal growth patterns and delay pubertal development. Several authors report that children with poorly controlled diabetes are at increased risk of growth retardation and abnormal body mass index values, including both underweight and overweight conditions (Malina et al., 2004).

Environmental and socio-economic factors further influence growth outcomes in children with endocrine pathology. Nutritional status, iodine intake, access to specialized healthcare services, and adherence to treatment significantly affect disease progression and physical development. Research indicates that children living in regions with limited healthcare resources often experience delayed diagnosis and suboptimal management of endocrine disorders, resulting in more pronounced growth impairment (Zimmermann, 2009).

Regional studies are particularly important for identifying population-specific growth characteristics and endocrine disease patterns. While international literature provides extensive evidence on the association between endocrine pathology and growth disturbances, region-

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specific data from areas such as the Andijan region remain scarce. Local environmental conditions, dietary habits, and healthcare accessibility may modify the clinical presentation and impact of endocrine disorders on children's growth and development (de Onis et al., 2010).

In summary, the reviewed literature consistently confirms that endocrine pathology in childhood is closely associated with disturbances in growth and development. Early identification, regular anthropometric monitoring, and comprehensive endocrine management are emphasized as key strategies for preventing irreversible growth impairment and ensuring optimal long-term health outcomes (World Health Organization, 2007).

Materials and Methods

This study was conducted as a descriptive and analytical cross-sectional analysis in the Andijan region. The study population included children aged 5–17 years diagnosed with endocrine pathology based on clinical, laboratory, and instrumental examinations. Endocrine disorders included thyroid dysfunction, diabetes mellitus, growth hormone deficiency, and other endocrine abnormalities.

Anthropometric measurements were performed using standardized techniques. Body height was measured with a stadiometer, body weight was recorded using calibrated scales, and body mass index was calculated as weight in kilograms divided by height in meters squared. Growth indicators were assessed according to age and sex and compared with World Health Organization reference standards.

Developmental assessment included evaluation of growth velocity, pubertal stage, and general physical development. Descriptive statistical methods were used to analyze the data. Ethical principles were observed, and all data were collected anonymously.

Results and Discussion

The analysis revealed that a significant proportion of children with endocrine pathology exhibited impaired growth and developmental deviations. Reduced linear growth was the most common finding, particularly among children with hypothyroidism and growth hormone deficiency. These children demonstrated lower height-for-age values compared to reference standards, indicating growth retardation.

Alterations in body weight and body mass index were also observed. Children with hypothyroidism and diabetes mellitus showed increased variability in body mass index, with cases of both underweight and overweight. Metabolic imbalance, insulin therapy, and reduced physical activity were identified as contributing factors.

Delayed pubertal development was noted in some children with long-standing endocrine disorders, reflecting the impact of hormonal dysregulation on sexual maturation. The severity of growth impairment was closely associated with disease duration and adequacy of treatment.

The findings are consistent with international studies reporting growth and developmental disturbances as common consequences of pediatric endocrine pathology. Environmental and socio-economic factors in the Andijan region may further influence these outcomes, emphasizing the need for region-specific preventive and therapeutic strategies.

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Conclusion

In conclusion, children with endocrine pathology in the Andijan region demonstrate significant impairments in growth and development compared to age-related normative standards. Endocrine disorders exert a substantial impact on linear growth, body composition, and pubertal maturation.

Early diagnosis, regular monitoring of anthropometric and developmental indicators, and comprehensive endocrine management are essential to prevent irreversible growth disturbances. Strengthening pediatric endocrine care and implementing targeted preventive programs may improve long-term health outcomes and quality of life for affected children.

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