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COMPARATIVE ANALYSIS OF ANTHROPOMETRIC INDICATORS IN HEALTHY CHILDREN AND CHILDREN WITH DIABETIC NEPHROPATHY IN ANDIJAN REGION

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Abstract

Anthropometric indicators are essential parameters for assessing physical development and overall health status in children. Chronic diseases such as diabetic nephropathy may negatively influence growth patterns, body composition, and nutritional status during childhood. This study presents a comparative analysis of anthropometric indicators in healthy children and children diagnosed with diabetic nephropathy in the Andijan region. Body height, body weight, and body mass index were evaluated and compared between the two groups. The findings demonstrate significant differences in growth parameters, highlighting the impact of chronic renal complications of diabetes on physical development. Regular monitoring of anthropometric indicators is crucial for early detection of growth disturbances and optimization of clinical management in affected children.

Keywords

Anthropometric indicators, children, diabetic nephropathy, physical development, body mass index, Andijan region

Introduction

Physical growth and development during childhood are sensitive indicators of health and well-being. Anthropometric measurements such as height, body weight, and body mass index provide valuable information about nutritional status, metabolic balance, and the presence of chronic disease. Normal growth patterns reflect adequate physiological adaptation, whereas deviations may indicate underlying pathological conditions.

Diabetic nephropathy is one of the most severe chronic complications of diabetes mellitus and may develop during childhood. Progressive renal dysfunction, metabolic disturbances, and hormonal imbalance associated with diabetic nephropathy can adversely affect physical development. Growth retardation, altered body composition, and delayed maturation are frequently reported in children with chronic kidney involvement.

Regional studies are particularly important for identifying population-specific growth characteristics and disease-related deviations. The Andijan region has a high prevalence of pediatric diabetes, yet data on the physical development of children with diabetic nephropathy remain limited. Therefore, comparative evaluation of anthropometric indicators in healthy children and children with diabetic nephropathy is of significant clinical and public health relevance.

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The aim of this study was to compare anthropometric indicators between healthy children and children diagnosed with diabetic nephropathy in the Andijan region.

Literature Review

Physical growth and development in childhood are widely recognized as sensitive indicators of overall health and nutritional status. Anthropometric measurements, including body height, body weight, and body mass index, are commonly used to assess physical development and identify deviations associated with chronic diseases. According to the World Health Organization, regular monitoring of anthropometric indicators allows early detection of growth disturbances and facilitates timely preventive and therapeutic interventions.

Numerous studies have demonstrated that chronic metabolic and renal diseases significantly affect physical development in children. Diabetes mellitus, particularly when complicated by diabetic nephropathy, is associated with progressive metabolic imbalance, hormonal dysregulation, and impaired nutrient utilization. These factors may lead to growth retardation, altered body composition, and delayed physical maturation. De Onis et al. emphasized that children with chronic illnesses are at higher risk of deviating from standard growth patterns compared to their healthy peers.

Diabetic nephropathy represents one of the most severe long-term complications of diabetes mellitus in pediatric patients. The literature indicates that renal dysfunction negatively influences growth through multiple mechanisms, including chronic inflammation, reduced insulin-like growth factor activity, metabolic acidosis, and protein-energy deficiency. Rees and Mak reported that children with chronic kidney involvement often exhibit reduced linear growth and lower body weight, even when receiving standard medical care.

Comparative studies between healthy children and children with chronic kidney disease consistently reveal significant differences in anthropometric parameters. Several authors have noted that growth impairment is more pronounced in children with longer disease duration and poor metabolic control. Body mass index in children with diabetic nephropathy shows variable patterns, with some studies reporting undernutrition and others indicating increased adiposity due to insulin therapy and reduced physical activity.

Regional investigations play an important role in understanding population-specific growth characteristics. Environmental factors, dietary habits, socio-economic conditions, and access to healthcare services may significantly influence anthropometric outcomes. Studies conducted in developing and transitional regions have demonstrated mixed patterns of underweight and overweight among children with chronic diseases, reflecting complex interactions between disease-related and lifestyle factors.

Research also highlights the importance of early diagnosis and comprehensive management of diabetic nephropathy to minimize its impact on physical development. Optimal glycemic control, adequate nutritional support, and regular assessment of growth indicators are emphasized as key components of pediatric diabetes care. Longitudinal studies suggest that timely intervention may partially restore growth trajectories and improve long-term outcomes.

In summary, existing literature provides strong evidence that children with diabetic nephropathy are at increased risk of impaired physical development compared to healthy peers.

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Comparative analysis of anthropometric indicators serves as a valuable tool for assessing disease impact and guiding clinical management. However, region-specific data, particularly from areas such as the Andijan region, remain limited, underscoring the relevance of further research in this field.

Materials and Methods

This study was conducted as a comparative cross-sectional analysis in the Andijan region. The study population included two groups of children aged 7–15 years. The first group consisted of clinically healthy children without chronic diseases, while the second group included children diagnosed with diabetic nephropathy based on clinical, laboratory, and instrumental criteria.

Standard anthropometric measurements were performed for all participants. Body height was measured using a stadiometer, and body weight was recorded using calibrated scales. Body mass index was calculated as weight in kilograms divided by height in meters squared. Measurements were analyzed according to age and sex.

The obtained data were statistically analyzed using descriptive and comparative methods. Mean values and standard deviations were calculated, and intergroup differences were assessed using appropriate statistical tests. Ethical principles were observed, and all data were collected anonymously.

Results and Discussion

The comparative analysis revealed notable differences in anthropometric indicators between healthy children and children with diabetic nephropathy. Healthy children generally demonstrated anthropometric values consistent with age-related reference standards, reflecting normal physical development.

In contrast, children with diabetic nephropathy showed a tendency toward reduced body height and lower body weight compared to their healthy peers. Body mass index values in the diabetic nephropathy group were more variable, with a higher prevalence of both underweight and growth retardation. These findings suggest that chronic renal involvement and metabolic disturbances negatively affect growth processes.

The observed growth impairment may be attributed to several factors, including prolonged hyperglycemia, protein-energy imbalance, hormonal dysregulation, and reduced appetite. Similar findings have been reported in other regional and international studies, confirming the negative impact of diabetic nephropathy on physical development in children.

The results emphasize the importance of early diagnosis and comprehensive management of diabetic nephropathy to prevent growth disturbances. Regular assessment of anthropometric indicators allows timely identification of deviations and implementation of targeted nutritional and therapeutic interventions.

Conclusion

In conclusion, children with diabetic nephropathy in the Andijan region demonstrate significant differences in anthropometric indicators compared to healthy children. Reduced

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body height, lower body weight, and altered body mass index patterns indicate impaired physical development associated with chronic diabetic complications.

Systematic monitoring of growth parameters should be an integral part of clinical follow-up for children with diabetic nephropathy. Early intervention, optimal metabolic control, and nutritional support are essential to improve physical development and long-term health outcomes in this vulnerable population.

References

1. World Health Organization. (2007). *WHO Growth Reference for School-Aged Children and Adolescents*. Geneva.
2. de Onis, M., et al. (2010). Development of a WHO growth reference for school-aged children. *Bulletin of the World Health Organization*, 88(9), 660–667.
3. Rees, L., & Mak, R. H. (2011). Nutrition and growth in children with chronic kidney disease. *Nature Reviews Nephrology*, 7(11), 615–623.
4. KDOQI Clinical Practice Guidelines. (2012). Evaluation and management of chronic kidney disease in children.
5. Malina, R. M., Bouchard, C., & Bar-Or, O. (2004). *Growth, Maturation, and Physical Activity*. Human Kinetics.