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ANTHROPOMETRIC FEATURES OF THE CHEST IN CHILDREN WITH RESPIRATORY PATHOLOGY

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Introduction

Chronic respiratory diseases in preschool children have a significant impact not only on respiratory function but also on overall physical development. The chest, being a key anatomical and functional component of the respiratory system, is particularly sensitive to prolonged pathological influences.

Under conditions of chronic hypoxia, impaired ventilation, and increased load on the respiratory muscles, children develop changes in the shape, size, and mobility of the chest. Anthropometric indicators such as chest circumference and body mass index (BMI) make it possible to objectively assess the degree of these changes and identify developmental deviations at early stages.

The use of modern assessment methods, including standard deviation (σ), centile tables, and Z-score, provides a comprehensive evaluation of physical development and allows for the detection of disharmonious conditions.

Materials and Methods

The study included 70 children aged 3 to 6 years. The main group consisted of 35 children with chronic respiratory diseases (chronic bronchitis and bronchial asthma), while the control group included 35 practically healthy children matched by age and sex. Anthropometric measurements were carried out, including the determination of chest circumference (CC) and calculation of body mass index (BMI). The obtained data were evaluated using centile tables (JSSST/WHO), standard deviation scores (Z-score), and sigma analysis (σ). Statistical processing included the calculation of mean values ($M \pm m$) and comparison of groups using Student's t-test, with differences considered statistically significant at $p < 0.05$.

Results

The analysis revealed that children with chronic respiratory diseases exhibited pronounced deviations in the anthropometric parameters of the chest.

The average chest circumference in the main group was 50.6 ± 2.4 cm, which was significantly lower compared to the control group and age-related norms ($p < 0.05$). This reduction indicates delayed growth and impaired formation of the chest.

The Z-score was -1.2 ± 0.4 , corresponding to a moderate delay in physical development. Centile analysis showed that 72% of children had values below the 25th



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percentile, and 20% were below the 10th percentile, indicating marked developmental disharmony.

Sigma analysis demonstrated a deviation of -0.8σ for BMI, suggesting a tendency toward reduced body weight in children with respiratory pathology.

Additionally, some children showed a tendency toward changes in chest shape (flattening), as well as reduced functional mobility, manifested by a 15–20% decrease in chest excursion.

Conclusion

Preschool children with chronic respiratory diseases show statistically significant changes in chest anthropometric parameters, characterized by reduced chest circumference, delayed growth relative to age norms, and impaired physical development harmony.

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