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**MORPHOFUNCTIONAL CHANGES OF THE CHEST IN PRESCHOOL CHILDREN WITH RESPIRATORY DISEASES**

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**Introduction**

Respiratory dysfunction in preschool children has a complex impact on the formation of the chest, which is a key structural element of the respiratory system. Under conditions of chronic respiratory diseases (chronic bronchitis, bronchial asthma, etc.), changes in breathing mechanics occur, the load on the respiratory muscles increases, and prolonged hypoxia develops.

These factors lead to morphofunctional remodeling of the chest, including changes in its size, shape, and mobility. Anthropometric research methods, supplemented by Z-score analysis, standard deviation ( $\sigma$ ), and centile indicators, allow for an objective assessment of the degree of deviations and early detection of physical development disorders.

**Materials and Methods**

The study included 90 children aged 3–6 years, divided into two groups: the main group (45 children with chronic respiratory diseases) and the control group (45 practically healthy children matched by age and sex). A comprehensive anthropometric examination was conducted, including the measurement of chest circumference (CC) and the assessment of its functional status. Quantitative evaluation was performed using standard deviation scores (Z-score), sigma analysis ( $\sigma$ ), and centile tables (JSSST/WHO). Statistical processing included the calculation of mean values ( $M \pm m$ ) and the determination of significance between groups using Student's t-test, with differences considered statistically significant at  $p < 0.05$ .

**Results**

The analysis showed that children with respiratory diseases demonstrated pronounced morphofunctional changes of the chest.

The average chest circumference was  $49.8 \pm 2.3$  cm, which was significantly lower compared to age norms and the control group ( $p < 0.05$ ).

The Z-score was  $-1.4 \pm 0.5$ , indicating a pronounced delay in physical development and a significant deviation from age standards.

Centile analysis revealed that 78% of children had values below the 25th percentile, and 26% were below the 10th percentile, indicating marked developmental disharmony.



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Sigma analysis showed a deviation of  $-1.2\sigma$ , confirming a stable tendency toward reduced growth rates of the chest.

Additionally, a decrease in chest excursion by 20–25% was observed, reflecting reduced respiratory mobility and impaired ventilation function. Some children also demonstrated a tendency toward chest flattening associated with chronic respiratory impairment.

### **Conclusion**

Preschool children with chronic respiratory diseases exhibit pronounced morphofunctional changes of the chest, characterized by reduced chest circumference, delayed growth relative to age norms, and impaired functional mobility.

The findings indicate significant physical development disharmony (Z-score up to  $-1.4$ , deviation  $-1.2\sigma$ , predominance of low centiles), reflecting the systemic impact of respiratory pathology on the child's organism.

The results highlight the importance of early anthropometric monitoring and the implementation of comprehensive rehabilitation measures aimed at improving respiratory function and normalizing physical development.

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