

**STUDY OF THE PHYSICAL STATUS OF CHILDREN WITH COMBINED DERMATO-  
RESPIRATORY ALLERGIC CONDITIONS IN ECOLOGICALLY COMPROMISED  
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**ABSTRACT**

This study evaluates the physical development of children diagnosed with combined dermatological and respiratory allergic conditions living in ecologically hazardous regions of the Aral Sea area. The main cohort included children with atopic and contact dermatitis, often in combination with allergic rhinitis, adenoiditis, and bronchial asthma. A control group matched by age and gender was also assessed. Physical status was determined through anthropometric measurements using body mass index (BMI) and the Quetelet index. Findings reveal that children with allergic diseases demonstrate reduced physical development compared to their healthy peers, likely influenced by the chronic nature of their conditions and the adverse environmental context.

**KEYWORDS:** dermatological-respiratory allergies, atopic dermatitis, physical development, BMI, ecologically adverse region, Aral Sea area.

**RELEVANCE**

Allergic diseases in children continue to pose significant challenges in pediatric care, particularly in areas affected by environmental degradation.<sup>[1,5]</sup>

Recent years have seen a growing prevalence of allergic conditions, underscoring the importance of further research. Studies indicate that the incidence of pediatric allergies in areas with high air pollution is 35% higher than in cleaner regions.<sup>[3,7]</sup>

In national medical practice, the term “dermato-respiratory syndrome” (DRS) is often used to describe the combination of skin and respiratory allergic disorders. International literature refers to this as the “atopic march,” beginning with atopic dermatitis (AD) in early childhood, followed by allergic rhinitis and eventually bronchial asthma.<sup>[1,4,8]</sup>

The Aral Sea region is severely polluted with airborne particles containing salts and chemical compounds from the dried seabed.<sup>[2,6]</sup> Environmental contamination—affecting air, soil, and water—along with toxic substances like salts and pesticides, poses considerable health risks, especially for children. In this area, an increased incidence of both skin and respiratory allergies has been documented. Children suffering from DRS are

particularly vulnerable to environmental stressors, which can negatively affect their overall condition and physical growth.<sup>[6,9]</sup> Assessing their physical development is crucial for timely intervention in terms of nutrition, daily routine, and therapy.

**RESEARCH OBJECTIVE**

To assess the physical development of children with dermato-respiratory allergic conditions residing in environmentally hazardous areas of the Aral Sea region, and to identify differences in anthropometric parameters compared to healthy children.

**MATERIALS AND METHODS**

The study group consisted of 62 children diagnosed with atopic or contact dermatitis, often alongside respiratory allergies such as allergic rhinitis, adenoiditis, or asthma. A control group included 37 healthy children matched for age and gender, with no chronic illnesses.

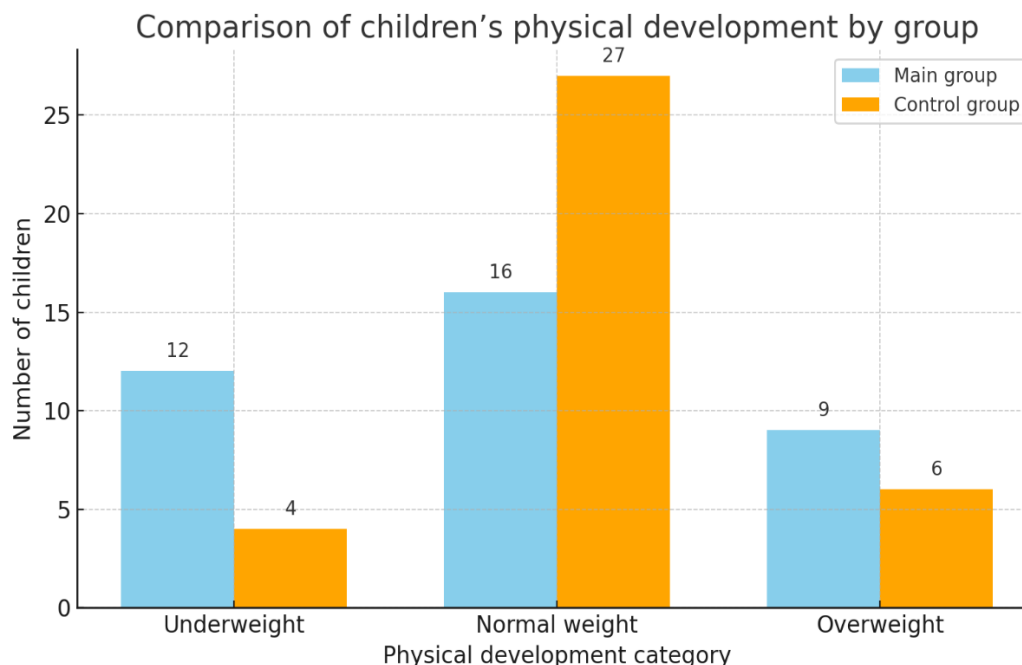
Atopic dermatitis was diagnosed using the SCORAD (Scoring of Atopic Dermatitis) index, which quantifies disease severity. Anthropometric evaluations included height and weight measurements, BMI calculations using percentile charts and standard deviation scores (SDS). The Quetelet index was applied to categorize weight

relative to height (kg/m<sup>2</sup>): <18.5 – underweight; 18.5–24.9 – normal; 25–29.9 – overweight; ≥30 – obesity.

## RESULTS AND DISCUSSION

Among children in the primary group, about 68% displayed signs of delayed physical development, most

notably through lower BMI values. Only 27% had age-appropriate measurements, while 5% were classified as obese. In the control group, 76% had normal BMI, 16% were underweight, and 8% showed signs of overweight. Fig.1.



**Figure 1: Comparison of physical development categories among children in the main and control groups.**

The most pronounced developmental delays were observed in children with prolonged atopic dermatitis and coexisting asthma. These children often showed reduced weight and height, likely due to chronic inflammation, poor appetite, reduced physical activity, and treatment side effects.

The greatest growth delays in children with atopic dermatitis compared to controls occurred between ages 7 and 9. Growth retardation in those with combined AD and respiratory allergies began between ages 10 and 13, peaking around 16–17 years. Body weight in AD children was consistently lower across all ages; however, at 13–14 years, it approached the weight of children in the control group. Statistically significant differences in body weight ( $p < 0.05$ ) persisted up to age 14. In older age groups, weight gain was more pronounced, accompanied by a significant increase in the Quetelet index.

These findings suggest that children with allergic dermatoses fall into a high-risk category, necessitating preventive interventions. A consistent decrease in the Quetelet index was observed across all age groups among children with combined AD and respiratory allergies compared to controls.

It is also important to highlight that living in the environmentally degraded Aral Sea zone is a risk factor

for poor physical and somatic health in children, regardless of allergy status. However, the presence of chronic allergic conditions significantly amplifies this risk.

## CONCLUSION

Children suffering from dermato-respiratory allergic disorders in ecologically hazardous regions of the Aral Sea area show more pronounced impairments in physical development than their healthy counterparts. The most vulnerable subgroup comprises children with both skin and respiratory allergies. The findings emphasize the importance of regular physical assessments and the integration of such children into medical and social support programs.

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