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THE IMPACT OF ALLERGIC DISEASES ON MENTAL DEVELOPMENT IN EARLY CHILDHOOD

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Abstract

Allergic diseases in early childhood are increasingly recognized not only as somatic disorders but also as conditions with important developmental and psychosocial consequences. Atopic dermatitis, food allergy, and allergic rhinitis may impair sleep, intensify irritability, increase family stress, and alter early patterns of interaction that are essential for optimal emotional and cognitive maturation. This study aimed to evaluate the association between allergic diseases and mental development in children aged 1 to 3 years. A comparative observational design was used. Sixty children were enrolled: 30 children with clinically confirmed allergic disease and 30 age-matched healthy controls. Clinical and developmental indicators were assessed through medical evaluation, parental interview, and age-appropriate observation of emotional, behavioral, communicative, and adaptive functions. Children with allergic disease more frequently demonstrated sleep disturbance, emotional lability, irritability, reduced social adaptation, lower play persistence, and relative slowing of early speech-related development than controls. The strongest negative correlates were persistent pruritus, recurrent symptoms, nasal obstruction, dietary restriction, and high parental anxiety. These findings support the need for a multidisciplinary approach to pediatric allergy that includes developmental surveillance and family-centered psychosocial support.

Keywords. early childhood, allergic diseases, mental development, atopic dermatitis, food allergy, allergic rhinitis, sleep disturbance, emotional regulation, psychosocial burden.

Introduction

Early childhood is a period of rapid brain growth and intense formation of emotional regulation, attachment behavior, early communication, adaptive responses, and the foundations of later cognitive functioning. Healthy development at this stage depends on good health, adequate nutrition, emotional responsiveness, protection from chronic stressors, and a stable environment for learning and interaction. Disruption in any of these domains during the first years of life may alter developmental trajectories.

Allergic diseases are among the most common chronic conditions in pediatric practice. Their burden often begins early through atopic dermatitis, food allergy, or allergic rhinitis. Although these disorders are usually discussed in dermatological, immunological, or

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respiratory terms, their developmental implications are increasingly evident. In children with atopic dermatitis, sleep disruption is especially prominent, while allergic rhinitis is commonly associated with nasal obstruction, poor sleep quality, and impaired daytime functioning. Food allergy creates an additional psychosocial burden because dietary restriction, fear of reactions, and caregiver anxiety may influence the child's emotional climate and adaptive behavior.

Thus, the relationship between allergic disease and mental development in early childhood is likely mediated through several interconnected mechanisms: chronic discomfort, pruritus, sleep fragmentation, repeated illness episodes, environmental restriction, dietary limitation, and family stress. Despite growing recognition of this problem, clinical practice in many settings still prioritizes somatic symptom control while developmental and psycho-emotional outcomes receive limited attention.

Aim of the study: to assess the impact of allergic diseases on mental development in children aged 1–3 years.

Objectives of the study: to characterize the clinical profile of allergic diseases in early childhood; to evaluate emotional, behavioral, communicative, and adaptive developmental indicators in affected children; to compare these indicators with those of healthy peers; and to identify the clinical and family-related factors most strongly associated with adverse developmental patterns.

Materials and Methods

This comparative observational study included 60 children aged 12 to 36 months. The main group consisted of 30 children with clinically confirmed allergic disease, including atopic dermatitis, food allergy, allergic rhinitis, and recurrent allergy-associated bronchial obstructive episodes. The control group consisted of 30 age-matched children without clinically significant chronic allergic pathology.

Inclusion criteria were age 1–3 years, availability of adequate clinical history, and informed parental consent. Exclusion criteria included severe congenital neurological pathology, major genetic syndromes, severe metabolic disease, and any condition expected to independently and substantially impair developmental assessment.

Clinical evaluation included allergic diagnosis, duration of disease, recurrence pattern, severity of itching, sleep quality, feeding restriction, nasal obstruction, and family allergic history. Developmental assessment focused on age-appropriate indicators of emotional regulation, social contact, separation response, play persistence, responsiveness to verbal instruction, preverbal or early verbal activity, irritability, and behavioral adaptation. Parents participated in semi-structured interviews addressing sleep, crying behavior, feeding-related distress, family stress, and daily routines.

The study used descriptive and comparative analysis. Because the present work is structured as an institutional observational article rather than a large epidemiological dataset, the emphasis was placed on clinically meaningful group differences and interpretation of developmental patterns rather than on advanced inferential modeling.

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Results

Children in the allergic disease group showed a consistently heavier developmental and psychosocial burden than healthy controls. The most prominent differences concerned sleep, irritability, emotional regulation, and adaptive functioning.

In the main group, atopic dermatitis was frequently associated with persistent pruritus, skin dryness, superficial sleep, repeated nighttime awakenings, and difficulty settling back to sleep. Children with allergic rhinitis often showed nasal obstruction, mouth breathing, restless sleep, and reduced daytime comfort. Children with food allergy more often demonstrated tension around feeding, selective eating, distress related to dietary limitation, and heightened caregiver vigilance.

The allergic disease group had markedly more sleep problems, and this variable appeared to cluster with daytime irritability, shorter sustained play, lower behavioral flexibility, and reduced tolerance of unfamiliar settings. Another strong correlate was parental anxiety, particularly in families of children with food allergy or recurrent allergic symptoms.

Indicator	Allergic disease group (n=30)	Control group (n=30)
Frequent irritability and crying	20 (66.7%)	8 (26.7%)
Sleep disturbances	22 (73.3%)	7 (23.3%)
Emotional lability	18 (60.0%)	6 (20.0%)
Reduced social adaptation	14 (46.7%)	5 (16.7%)
Decreased play persistence	16 (53.3%)	6 (20.0%)
Relative slowing of early speech development	12 (40.0%)	4 (13.3%)

Overall, the most influential factors associated with worse developmental patterns were persistent itching, recurrent symptoms, poor sleep quality, strict dietary limitations, nasal obstruction, and elevated caregiver anxiety.

Discussion

The study findings support the view that allergic disease in early childhood should be conceptualized not merely as a somatic disorder but as a chronic regulatory stressor acting on the child–family system. A narrow organ-based interpretation misses the developmental cost of recurring discomfort, sleep fragmentation, behavioral dysregulation, and parental stress.

The first pathway appears biological and behavioral at once: chronic symptoms impair sleep. In early childhood, sleep is a developmental necessity. It supports neural plasticity, emotional modulation, attention, memory consolidation, and recovery. When pruritus, nasal obstruction, cough, or recurrent discomfort repeatedly interrupt sleep, daytime irritability and reduced adaptive capacity are predictable rather than incidental.

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The second pathway is relational. Chronic allergic disease often reorganizes family life around surveillance, avoidance, treatment, and fear of exacerbation. Parents may become anxious, overprotective, or emotionally exhausted. The child develops within this emotional atmosphere, and part of the developmental burden of allergy may arise not only from inflammation itself, but also from disrupted caregiver–child interaction under chronic stress.

The third pathway is experiential restriction. Children learn through movement, play, novelty, feeding experience, and social contact. Recurrent symptoms, sleep debt, dietary limitation, and frequent medical interventions may reduce exposure to exactly those experiences that support self-regulation and cognitive-social maturation.

The observed changes should not automatically be interpreted as severe or irreversible deficits. A more defensible conclusion is that allergic disease may create a pattern of functional developmental vulnerability. If symptoms are controlled early, sleep improves, parental anxiety is addressed, and developmental monitoring is integrated into care, the negative trajectory may be attenuated.

Conclusion

Allergic diseases in early childhood are associated with an increased burden on mental and behavioral development. In this study, children with allergic pathology more often exhibited sleep disturbance, irritability, emotional lability, reduced social adaptation, lower play persistence, and relative slowing of early speech-related development than healthy controls.

The most plausible and clinically relevant mediators of this association are persistent symptoms, especially pruritus and nasal obstruction, sleep fragmentation, dietary restriction, recurrent exacerbations, and high caregiver anxiety.

Therefore, children with allergic disease should be evaluated not only for symptom severity but also for developmental risk. Early diagnosis, symptom control, sleep-focused management, parental psychoeducation, and multidisciplinary follow-up may improve both somatic and developmental outcomes. Future studies should use larger samples, standardized developmental scales, and longitudinal designs to clarify causality and identify the most effective intervention points.

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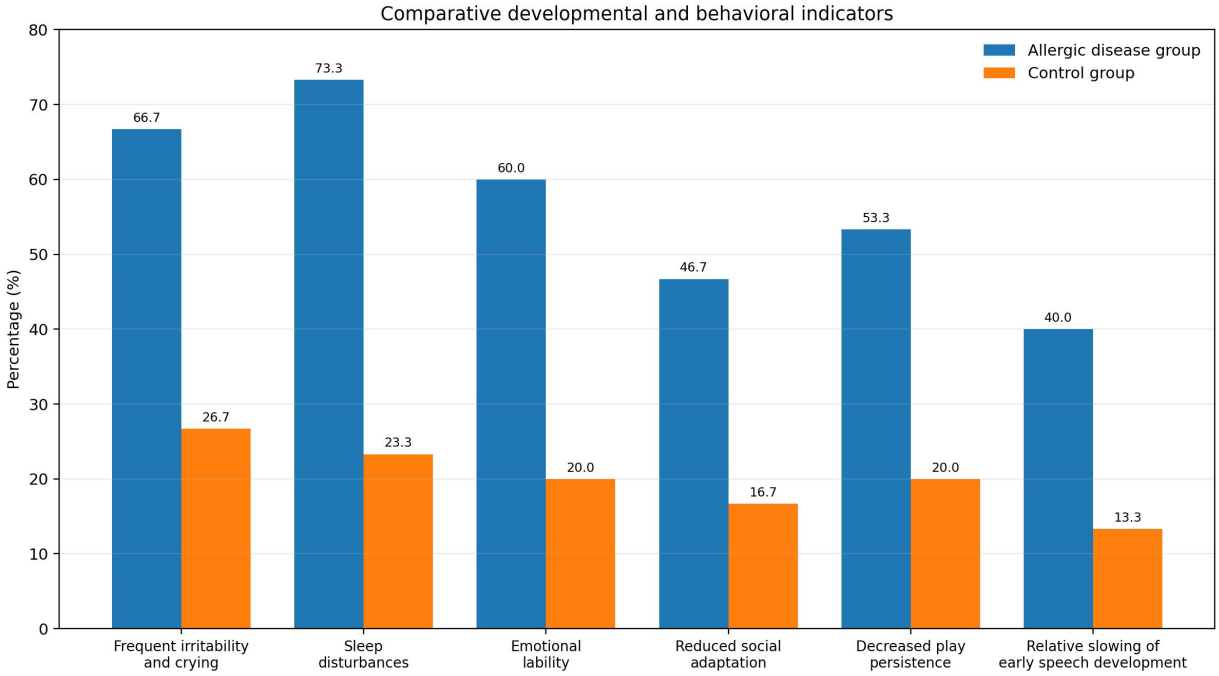


Figure 1. Comparative developmental and behavioral indicators in children with allergic diseases and healthy controls.

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