



CLINICAL-IMMUNOLOGICAL ASPECTS OF ALLERGIC DISEASE DEVELOPMENT IN CHILDREN WITH CHRONIC ADENOIDITIS

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Article Received on 04/04/2023

Article Revised on 25/04/2023

Article Accepted on 14/05/2023

ABSTRACT

Background: Brain Gym Exercises significantly improves the attention function of the adults. There is a tremendous impact of Brain Gym on the adults, after two weeks of implementation of brain gym program. There was an increase in memory, cognitive function, concentration, attention and alertness to reduce senility or dementia. **Aim and Objective of The Study:** The main aim of the study is to evaluate the effect of neuroplasticity based brain Gym Exercises in improving attention among adults. **Need of the Study:** Attention deficit can be frustrating, but most of the time they aren't cause for concern. Age related changes are not the same thing as dementia. There are many ways to improve cognitive skills, prevent lack of attention and protect the grey matter, especially Brain Gym exercises are given to overcome such problems in adults. **Method:** 30 Subjects falling in the age of 30-40 yrs, who were noticed as suffering from attention deficit, were separated into two groups. 15 subjects included in the experimental group were given brain gym exercises and the remaining 15 subjects included under the control group were treated with brain gym exercises for a period of six weeks, one hour per day for 5 days per week. The outcome measure used was attention control scale. **Result:** The data collected were statistically analyzed by paired t-test. From the result of the statistics, it was found out that the attention span of the subjects was increased. **Conclusion:** The study concluded that brain gym exercise was more effective in improving attention among adults.

KEYWORDS: Brain gym exercise, cognition, attention, attention deficit, attention control scale.

The palatine tonsil (PT) is a structurally organized cluster of lymphoid tissue associated with mucosa-associated lymphoid tissue (MALT) and participates in immune mechanisms.^[4] Together with non-specific protective factors such as mucociliary transport, production of lysozyme, interferon, and others, the PT carries out a barrier function of the upper respiratory tract mucous membranes.^[2]

The problem of chronic diseases of the lymphoid ring, due to their medical and social significance, is in the focus of attention of otolaryngologists, pediatricians, and immunologists.^[7] Diseases of the lymphoid ring organs rank first in prevalence among all otorhinolaryngological diseases in pediatric otorhinolaryngology.^[5] Among chronic diseases of the lymphoid ring, a special place is occupied by the pathology of adenoid vegetations (PT).^[11]

There is a worldwide trend of increasing incidence of adenoiditis in children. The highest level of prevalence of otorhinolaryngological diseases is observed in the nursery and preschool age, where the pathology of the palatine tonsil (adenoids, chronic adenoiditis) accounts

for 51.8% of the disease structure.^[9] In preschool age, the second degree of physiological hypertrophy of the adenoid vegetations is observed in about 70% of children.^[8]

The problem of the role of allergy in the onset and course of chronic adenoiditis in children has become particularly relevant in recent years. This is due to the fact that children with allergic rhinitis are often diagnosed with "adenoid vegetations".^[2,5]

Often, in children with adenoids and adenoiditis, there is mucous swelling from the nasopharynx to the oropharynx and laryngopharynx, leading to persistent coughing. The inflammatory process often spreads to the nasal cavity, forming rhinitis, sinusitis with abundant discharge from the nose, irritating the skin of the vestibule of the nose and upper lip, which becomes hyperemic, thickened, and covered with cracks. Similar conditions can be observed during the exacerbation of allergic rhinitis. Difficulty in nasal breathing, caused by adenoids and adenoiditis, often leads to impaired

ventilation of the paranasal sinuses (PNS) and subsequently to their chronic inflammation.^[3]

The aim of this study is to investigate the characteristics of the cytokine profile in nasal secretions and serum of patients with allergic rhinitis and chronic adenoiditis, where additional sensitization to microbial and allergenic agents may occur.

The material and methods of the study. In this study, 142 children with various forms of allergic rhinitis on the background of chronic adenoiditis, aged 4 to 16 years, were examined. The allergological examination included collecting an allergological history (seasonality or year-round nature of clinical symptoms, periods of most pronounced symptomatology, influence of meteorological conditions and patient's living conditions, presence of oral allergic syndrome); performing skin prick tests with extracts of household, pollen, and animal allergens. The concentration of total IgE was determined in serum using a reagent kit for the enzyme-linked immunosorbent assay (ELISA) method in accordance with the manufacturer's instructions. Immunological studies were carried out in a clinical diagnostic laboratory. To determine the state of innate and adaptive immunity, indicators of the cytokine profile of serum (IL-4, IL-18) were determined by the enzyme-linked immunosorbent assay (ELISA) method using the "Vector-Best" kits, Novosibirsk, according to the manufacturer's instructions.

Results of the study and their discussion. Hyperplasia of lymphoid tissue in the nasopharynx (adenoids of grades I-III) was detected in 60.6% of children. Allergic reactions of the respiratory tract were detected in 25.2% of children (every fourth child) during clinical-allergological examination. The peculiarities of the course of adenoiditis in the presence of respiratory allergies were studied and therapeutic measures were carried out in these children.

Analysis of the frequency of allergic diseases (respiratory allergies, bronchial asthma, and allergic dermatitis) and significant hypertrophy of adenoid vegetation showed that the increase in the frequency of adenoids with age coincides with the increase in cases of respiratory allergy, and vice versa. The most common causes of allergic diseases are household allergens (house dust, feather pillows, animal hair, cockroaches) and mold fungi. The results of bacteriological examination of the surface of the pharyngeal tonsil indicate that the polymorphic character of the microflora is most often determined, with a predominance of staphylococcus both in pure form and in combination with streptococcus. Given that respiratory allergies were detected in every fourth (25.2%) child with adenoids, and the important role of the pharyngeal tonsil in the implementation of general and local immunity, studies of the immune status of these children were carried out.

The results of the studies indicate that allergic reorganization mainly occurs in response to microbial allergens and is of a reaginic nature. The presence of allergy significantly reduces the level of humoral factors of local immunity, primarily the concentration of secretory IgA (sIgA) both in tissue and in the secretions of the upper respiratory tract.

The serum cytokine profile in children with AR, characteristic of the period of exacerbation of the disease symptoms. It has been established that in AR patients with adenoiditis, the concentration level of the cytokine IL-18 and the pro-inflammatory cytokine IL-4 is almost 2 times higher than in the control group. In AR patients with adenoiditis during the seasonal exacerbation period, the serum cytokine profile was significantly different from the profile in patients with chronic adenoiditis without AR. In AR patients with adenoiditis, an inverse correlation was found between the level of total IgE and the age of the patient ($r = -0.51$, $p=0.025$). The same correlation was shown in this group of patients between the level of the cytokine IL-4 and age ($r = -0.45$, $p=0.025$).

Characterizing the cytokine profile in serum, especially in AR patients with adenoiditis, it can be noted that the immune-mediated inflammatory reaction of the upper respiratory mucosa is characterized by a more pronounced production of IL-4. In most cases, this occurs due to the selective diversity of Th2 lymphocytes, which secrete a cluster of cytokines encoded on chromosome 5q31-33, including interleukins IL-3, IL-4, IL-5, and macrophage granulocyte colony-stimulating factor.^[16]

The level of IL-18 inversely correlated with the age of the patients. The older the age of the patients, the less pronounced the level of this cytokine in the serum during the development of allergic inflammation in AR patients with adenoiditis. Allergens that are fixed in the nasal and nasopharyngeal cavities become triggers for allergic inflammation, while viral replication and bacterial colony growth lead to the development of infectious inflammation, which can result in clinical differences between these forms of pathology.

CONCLUSION

The issues of the combination and interaction of allergic rhinitis, adenoids, and bronchial asthma, as well as the impact of adenoidectomy on the further course of allergic rhinitis, require serious investigation. The risk of adenoidectomy and the development of negative consequences due to the disruption of the immune barrier, as well as the recurrence of adenoid vegetation, can be significantly reduced by local pharmacological treatments. Therefore, the development of conservative methods for the treatment of chronic adenoiditis aimed at preserving the pharyngeal tonsil becomes particularly relevant, especially in children with allergic respiratory disease.

LITERATURE REVIEW

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