Evaluation of the Effect of Allergic Rhinitis on Adenoid Hypertrophy and Otitis Media With Effusion Combination By Using Score For Allergic Rhinitis (Sfar)

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ABSTRACT

Objective: The aim of this study is to determine whether allergic rhinitis exerts any effect on middle ear pathology in patients undergoing operation for adenoid vegetation by using SFAR.

Material and Methods: In this study 72 patients with adenoid vegetation were analyzed retrospectively. Twenty-five patients (Group 1) underwent adenoidectomy and ventilation tube, while 47 patients (Group 2) underwent only adenoidectomy. Patients with adenoidectomy indications included those who were found to have 70-100% obstruction due to adenoid vegetation in nasopharynx via flexible endoscope, and patients undergoing VT included those who had intractable otitis media despite more than three months of treatment along with adenoid hypertrophy. SFAR was recorded after assessment of all the patients. Group 1 and Group 2 patients were compared using SFAR.

Results: No statistically significant difference was found between Group 1 and Group 2 in terms of allergic rhinitis score measured by SFAR (p=0.150). In the operated patient group, the rate of allergic rhinitis was significantly higher in those who are older than 7 years (p=0.020). No impact of gender was found on the rate of allergic rhinitis (p=0.829). No significant difference was found between Group 1 and Group 2 in the evaluation made with SFAR (p=0.273). Mean SFAR score was found to be 10.500±0.71 in Group 1 and 9.00±2.16 in Group 2.

Conclusion: In this study no impact of allergic rhinitis on adenoid hypertrophy and adenoid hypertrophy accompanied with otitis media with effusion was found using SFAR. In order to reach a definitive conclusion, further studies with higher number of patients and which include prospective invivo and invitro tests are required.

Key Words: Adenoids, Allergic Rhinitis, Otitis media with effusion

ÖZ

Amaç: Adenoid vejetasyon nedeniyle opere edilen hastalarda orta kulak patolojisi saptanmasında alerjik rinitin etkisi olup olmadığını SFAR kullanarak saptamaktır.

Gereç ve Yöntemler: Bu çalışma adenoid hipertrofi nedeniyle 72 hastanın incelendiği retrospektif bir çalışmadır. 25 hastaya (Grup 1) Adenoidektomi+ventilasyon tüpü (VT) uygulaması, 47 hastaya (Grup 2) sadece Adenoidektomi uygulaması yapıldı. Adenoidektomi endikasyonu konulan hastalar yapılan fleksibl endoskopik muayenede nasofarinkste pasaj %70-100 arasındadı kapatan adenoid vejasyonu saptanan hastalardan, VT uygulaması yapılan hastalar adenoid hipertrofi ile birlikte 3 aydan daha uzun süre aldığı tıbbi tedaviye rağmen gerilememen kronik effüzyonlu otitis media (EOM) sahip hastalardan oluşmacaktır. Tüm hastaların değerlendirildiğinde alerjik rinit semptom skoru (SFAR) kaydedildi. Grup 1 ve 2 hastalar SFAR değeri hesaplanarak karşılaştırıldı.

Bulgular: Grup 1 ve Grup 2 hastalar SFAR ile alerji yönünden karşılaştırıldığında gruplar arasında istatistiksel olarak anlamlı bir fark bulunmamıştır (p=0.150). Opere edilen hastalarda yaş ile birlikte alerjik rinit saptanması 7 yaşından büyük olan grupta istatistiksel olarak anlamlı artıştır (p=0.020). Cinsiyetin alerjik rinit saptanması üzerine etkisi saptanmamıştır (p=0.829). Gruplar arasında SFAR değerlendirildiğinde Grup 1 ve 2 arasına istatistiksel olarak anlamlı değişiklik saptanmamıştır (p=0.273). Grup 1 de ortalaması SFAR 10.50 ±0.71 icken, Grup 2 de 9.00±2.16 saptanmıştır.
Sonuç: Bu çalışmada adenoid hipertrofü ve adenoid hipertrofy eşlik eden EOM’ı hastaların SFAR kullanılarak karşılaştırılmasında alerjik rinitin etkisi olmadığı saptanmıştır. Ancak kesin bir yargıya varmak için artırılmış hasta sayılanı içeren, diagnostic invivo ve invitro testleri içeren prospektif çalışmalarla ihtiyaç vardır.

Anahtar Sözcükler: Adenoid, Alerjik rinıt, Effüzyonlu otitis media

INTRODUCTION

Adenoid hypertrophy is one of the most common causes of nasal obstruction in childhood. Adenoid tissue hypertrophy occurs as a consequence of lymphoid and epithelial cell hyperplasia in association with chronic inflammation. Although chronic inflammation usually results from chronic infections, chronic allergic reactions may also play a role in it (1). In various studies, specific IgE synthesis and sensitized mast cells have been detected in nasopharyngeal lymphoid tissue (2). Adenoid vegetation may lead to middle ear pathologies such as recurrent acute otitis media, and otitis media with chronic effusion and sinus pathologies, irrespective of its size. Variation in middle ear symptoms in patients with adenoid vegetation suggests the presence of additional pathologies influencing eustachian functions.

It has been demonstrated in many studies that allergic reactions affect middle ear and eustachian tube mucosa in addition to nasal mucosa and nasopharyngeal mucosal membranes (3-6). It was also shown that the prevalence of allergic rhinitis increases in patients with chronic otitis media with effusion (6,7). Even though the incidence of allergic rhinitis in the community ranges between 10%-54%, in studies on its effect on adenoid tissue, middle ear and eustachian functions, variable results have been obtained (8,9). In the diagnosis of allergic rhinitis, history of allergic symptoms and invivo and invitro tests are utilized (10). However, in various studies, it was demonstrated that SFAR correlates with standard diagnostic tests and can be employed in the diagnosis and treatment of allergic rhinitis (11,12).

The aim of the present study was to determine whether allergic rhinitis exerts any effect on middle ear pathology in patients undergoing operation due to adenoid vegetation.

MATERIALS and METHODS

The present study is a retrospective one in which 72 patients who underwent operation for adenoid vegetation in Ear, Nose and Throat Clinic during 2018-2019 were included. The data of the patients were retrospectively analyzed after approval of the study protocol by Academic Committee for Clinical Research (January 20, 2020; decree no: 14). Twenty five patients (Group 1) underwent Adenoidectomy+ventilation tube (VT), while 47 patients underwent (Group 2) only Adenoidectomy. Prior to operation, detailed histories were elicited and physical examination was carried out, determining operation indications. Age and sex of the patients were recorded. Patients considered indicated for adenectomy included those who were found to have adenoid vegetation which was found to close passage of nasopharynx at the rate of 70-100% with examination carried out using flexible endoscope. Patients with tonsil hypertrophy, septum deviation and nasal polyps were excluded from the study. Patients undergoing VT included those who had otitis media with chronic effusion, which was recalcitrant to more than 3 months of medical treatment, in addition to adenoid hypertrophy. After the evaluation of all patients, allergic rhinitis symptom scores (SFAR) were recorded. Patients with allergic rhinitis included those with SFAR score of 7 or over. Patients in Groups 1 and 2 were compared using SFAR.

Statistical evaluation

The analysis of statistical data was carried out with SPSS 17 program. In continuous variables, descriptive statistics were expressed with mean. (+-) standard deviation and in categorical variables, it was expressed with number and percentage. In the analysis of categorical variables, chi square test was used while in the analysis of continuous variables, Mann Whitney U test was used, as the difference between mean values were not normally distributed p<0.05 value was considered statistically significant in all results.

RESULTS

Overall 72 patients with adenoid hypertrophy were included in the study. Twenty five patients in Group 1 (34.7%) underwent Adenoidectomy+VT, while 47 patients in Group 2 (65.3%) underwent only Adenoidectomy. Mean age of the patients was 6.00 ± 2.18 in Group 1, while it was 7.40 ± 5.23 in Group 2. 61.1% of the patients was female, while 38.9 % was male. 55.6% of the patients (40) was under the age of 7, while 44.6% (32) was over the age of 7. There was no significant difference between groups in terms of age and sex (p=0.059, p=0.580) (Table I).

No significant difference was found between Group 1 and 2 with regard to SFAR scores. (p=0.150) (Tablo II). The rate of allergic rhinitis in patients that underwent operation was significantly higher in the age group over 7 (p=0.020). No significant effect of sex on the rate of allergic rhinitis was found (p=0.829).

The rate of allergic rhinitis was found to be %18 (2 patients) in Group 1, while it was 21.3% (10 patients) in Group 2. Overall rate of allergic rhinitis was found to be 16.7% (12 patients).

No significant difference was found between Group 1 and 2 with respect to SFAR scores (p=0.273). No statistically significant difference was found either when they were evaluated with
In the present study, the rate of allergic rhinitis was found to be respectively 8% and 21.3% in Groups 1 and 2 respectively using SFAR and overall rate of allergic rhinitis was 16.7%. This finding indicates that in children with adenoid vegetation, the combination of adenoid vegetation with otitis media with effusion does not lead to an increase in the incidence of allergic rhinitis. Among patients undergoing operation, the fact that the rate of allergic rhinitis increases in the groups over the age of 7 suggests that allergy prevents the regression of adenoid tissue.

In the diagnosis of allergic rhinitis, typical allergic symptom history and diagnostic laboratory tests are used (10). These
tests comprise invivo (specific IgE etc.) and invitro (skin tests) tests (10). SFAR, is a test originally defined in 2002 and is used to determine the prevalence of allergic rhinitis (11). In various studies, it was shown that SFAR correlates with standard diagnostic tests and can be used in the diagnosis and treatment of allergic rhinitis (11,12). In the study of Ologe et al. (12), the sensitivity and specificity of SFAR in the diagnosis of allergic rhinitis was reported to be 94.8% and 95.1% respectively.

In the study of Griffin et al. (13), the rate of allergic rhinitis in children with adenoid vegetation was established to be 21.1%. Likewise, in the study of Ameli et al. (14), it was reported that in children without atopic sensitization, the incidence of adenoid hypertrophy increased and that there was inverse proportion between adenoid hypertrophy and allergy. The results of the aforementioned studies are congruent with those of the present study. However, in the literature, there are also studies finding increase in the incidence of allergy among children with adenoid hypertrophy (5,16). In the studies of Moldrynski et al. (15) and Sadeghi-Shabestarive et al. (16), it was stated that in allergic patients, adenoid hypertrophy occurs more commonly than normal population. There are also studies demonstrating that nasal steroids decrease the need for adenoidectomy by reducing the volume of adenoids (17,18). In the present study, the prevalence of allergic rhinitis was significantly higher among children over the age of 7, suggesting that, although the size of the adenoids decrease with age, this does not occur when it is concurrent with allergic rhinitis.

It was demonstrated in many studies that allergic rhinitis exerts effect on nasal and nasopharyngeal mucosa and eustachian tube functions (3-5). It is thought that mediators and cytokines released during allergic reactions lead to nasal and nasopharyngeal edema and hypersecretion, resulting in eustachian dysfunction (3-6). In patients having otitis media with chronic effusion, it was reported that there is an increase in the prevalence of allergic rhinitis (6,7). In a study carried out with 87 patients with chronic secretory otitis media, it was shown that nasal allergy influences eustachian tube functions and leads to pressure changes in middle ear (6). The role played by allergy in otitis media with effusion may be attributed to nasopharyngeal inflammation and obstruction caused by edema in eustachian tube and to passage of bacteria from nasopharynx to middle ear via hypersecretion produced by allergic reaction. In the study conducted by Saifudin et al. in 2019, it was established in children with otitis media with effusion that prevalence of allergic rhinitis was high. In the study of Cafarelli et al. (20) allergic rhinitis was found in 16.3% of children with otitis media with effusion. In the present study, in patients who have adenoid vegetation along with otitis media with effusion no difference was found between two groups in terms of nasal allergy. This finding may be attributed to the evaluation of only the patients who have otitis media with effusion along with hypertrophic adenoid vegetation, variatons between regions, small number of patients and using SFAR for evaluation.

Limitations of the present study are that there were few patients, no comparison was made with healthy control groups and SFAR was used instead of diagnostic tests.

**CONCLUSION**

In the present study, no affect of allergic rhinitis was found using SFAR on patients who have adenoid hypertrophy in addition to otitis media with effusion. However, further prospective studies involving diagnostic invivo and in vitro tests and higher number of patients are required in order to reach definitive conclusion on this issue.

**Compliance with Ethical Standards:**

**Conflict of Interest:** On behalf of all authors, the corresponding author states that there is no conflict of interest.

**Ethical approval:** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed consent:** Informed consent was obtained from all individual participants included in the study.

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