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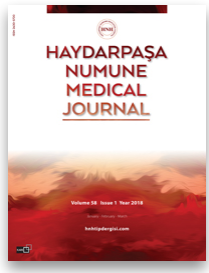

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ORIGINAL ARTICLE

The Role of Increase of Total IgE and Passive Smoking in Adenoid Vegetation Recurrences

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Abstract

Introduction: This study aims to investigate the association of recurrent adenoid vegetation with cigarette exposure and allergy in long-term follow-up of patients undergoing adenoidectomy.

Methods: We included patients who underwent only adenoidectomy in our clinic between the years 2010-2014. All of the patients were evaluated by systemic assessment and physical examination. The incidence of cigarette exposure and total IgE increase were investigated and compared in patients with recurrent adenoid vegetation.

Results: In this study, among 30 cases, 18 of them were male and 12 of them were female whose age ranged from four to 17 years. The average is 9.70±3.71 years. The BMI measures ranged from 8.88 to 26.23, with an average of 17.11±4.49. 15 cases had a recurrence of adenoid vegetation. 15 cases had no recurrence. Total IgE was found high in five of the patients. 16 patients had allergic rhinitis. Three patients had asthma and two patients had atopic dermatitis. There was no statistically significant difference between recurrent and control group in terms of smoking exposure, total IgE level and the presence of allergic disease (p>0.05).

Discussion and Conclusion: The findings suggested that there is a significant relationship between atopy and AV in the literature. According to these findings, no significant association was found between AV recurrence and allergy. Because of the small population of this study, the results of this study were accepted as preliminary findings.

Keywords: Adenoid vegetation recurrence; allergy; atopy; cigarette exposure; total IgE.

Adenoid vegetation (AV), which is one of the most common causes of nasal obstruction in childhood, becomes symptomatic with the growth of lymphoid tissue in the nasopharynx. In a child with AV a wide range of symptoms and signs can be seen, including nasal obstruction, open mouth sleep, snoring, frequent upper respiratory tract infections and obstructive sleep apnea [1].

A child with chronic AV may develop a typical adenoid face consisting of a long face, pulling up of the upper lip and exposed upper incisors. In addition, AV increases the susceptibility to acute serous otitis media and acute otitis media due to its mass effect in the nasopharynx. AV increases the incidence of nasal and paranasal sinus diseases as well as predisposes to upper and lower respiratory allergic diseases and renders these diseases resistant to treatment. The diagnosis of AV, which needs to be treated before irreversible damage develops, can be made with the help of the patient's history, physical examination methods and radiological imaging. Digital palpation and endoscopic nasopharynx examination may provide a direct diagnosis in cooperative patients [1].

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Studies advocate that AV is related to the presence of atopy in the patient. Coexistence between allergic rhinitis and AV has been reported to be significant. Also, some studies have suggested a significant relationship between increased IgE levels and adenotonsillar hypertrophy [2–12]. Smoking by parents leads to ciliary dysfunction in children and thus increases the incidence of upper respiratory tract infections, such as chronic sinusitis and chronic otitis media. Repetition of such infections may pave the way for the formation of adenoid hypertrophy by lymphoid tissue stimulation [13–17].

Allergy and passive smoking may have a role in patients who had undergone adenoidectomy and developed recurrent adenoid hypertrophy. In this study, based on this information in the literature, AV recurrence was screened in long-term control of children who had undergone adenoidectomy, and it was planned to investigate the role of atopy and exposure to cigarette smoke in recurrent cases.

Materials and Methods

The patients aged 4-17 years with total IgE values above 200 IU/L who had undergone adenoidectomy operation in our clinic at least 6-16 months ago between 2010 and 2014 were included in this study after approval of the Clinical Research Ethics Committee of Haydarpaşa Numune Training and Research Hospital was obtained. Patients who had undergone additional surgical procedures other than adenoidectomies, such as ventilation tube application or tonsillectomy, were not included in the study group.

Files of only 30 patients who had undergone adenoidectomy were retrospectively reviewed. Identity information, anamnesis, body mass indexes, date of operation, physical examination findings and laboratory tests recorded during the application were noted on the case report forms. Anamnesis records were examined for nasal obstruction, history of frequent upper respiratory tract infections, open mouth sleep, mouth snoring and apnea, and also upper airway complaints were investigated. The findings were noted by questioning whether the patient himself/herself smoked in the adolescent age group and whether or not his/her family was a smoker in all age groups. Among laboratory findings, total IgE values were recorded using RAST® test, and cases with higher than normal values were determined.

Patients underwent a detailed ear nose throat and systemic examination at least six months postoperatively. Physical examination also investigated the presence of allergic rhinitis. Endoscopic nasopharynx examination was performed to determine the degree of choanal obstruction. The choanal obstruction was graded as according to degree of the obstruction as follows: Grade 1. 0-25%; Grade 2. 26-50%; Grade 3. 51-75%; and Grade 4. 76-100% obstruction. Non-Grade 1 cases were noted as AV recurrence. After detailed interrogation and detailed physical examination, cases with symptomatic recurrence were determined

Table 1. Characteristic of the demographic findings (n=30)

	Min.–Max.	Mean±SD
Age (year)	4–17	9.70±3.71
Weight (kg)	12–85	35.60±18.28
Height (cm)	100–200	139.53±21.42
BMI kg/m^2	8.88–26.23	17.11±4.49
	n	**%**
Gender		
Male	18	60.0
Female	12	40.0
Smokers in the family	20	66.7
Smoking patients	3	10
Total IgE (+)	5	16.7
Nasal endoscopic findings		
Natural	8	26.7
Mild discharge and edema	21	70.0
Septum deviation+ severe edema+ clear discharge	1	3.3

Min.: Minimum; Max.: Maximum; BMI: Body mass index.

Statistical analyses

NCSS (Number Cruncher Statistical System) 2007 (NCSS. LLC Kaysville. Utah. USA) was used for statistical analysis. Independent Samples test was used to evaluate the study data. Yates Continuity Correction and Fisher's Exact test were used to compare qualitative data. The results were evaluated using a 95% confidence interval and $p<0.05$ significance level.

Results

Using the database of our clinic encompassing the period between 2010 and 2014, 18 (60%) male and 12 (40%) female patients ages ranging between 4-17 years (mean: 9.70±3.71 years) were included in this study (Table 1). The mean weights and heights of the patients were 35.60±18.28 kg (12-85 kg) and 139.53±21.42 cm (100-200 cm), respectively.

Body mass indexes (BMIs) of the patients ranged from 8.88 to 26.23 kg/m^2 (mean: 17.11±4.49 kg/m^2) (Table 1). Age

Table 2. Evaluation of variables in terms of recurrence

	Adenoid scores				
	Recurrence (+) (n=15) Mean±SD (Median)		Recurrence (-) (n=15) Mean±SD (Median)		p
Age (year)	9.53±4.17 (9)		9.87±3.33 (9)		[a]**0.811**
BMI kg/m^2	17.30±4.85 (17)		16.91±4.24 (17.21)		[a]**0.818**
	n	%	n	%	
Gender					
Female	6	40.0	6	40.0	[b]**1.000**
Male	9	60.0	9	60.0	
Passive smoking in the family					
Yes	9	60.0	11	73.3	[b]**0.699**
No	6	40.0	4	26.7	
Total IgE (+)					
Yes	1	6.7	4	26.7	[c]**0.330**
No	14	93.3	11	73.3	
Alergic disease (+)					
Yes	8	53.3	9	60.0	[b]**1.000**
No	7	46.7	6	40.0	
Symptomatic recurrence (+)					
Yes	9	60.0	9	60.0	[b]**1.000**
No	6	40.0	6	40.0	

[a]Independent Samples T-test; [b]Yates Continuity Correctionc Fisher's Exact Test; BMI: Body mass index; SD: Standard deviation.

and BMI distributions did not show statistically significant differences in terms of recurrence rates (p>0.05) (Table 2). More than half (66.7%) (n=20) of the families were smokers (Table 1). There was no statistically significant difference between gender and family smoking rates in terms of recurrence (p>0.05) (Table 2).

Elevated total IgE values were not observed in 16.7% (n=5) of the patients (Table 1). There was no statistically significant difference between the total IgE values in terms of recurrence rates (p>0.05) (Table 2). Nasal endoscopic examinations revealed the presence of normal nasal mucosa in 26.7% (n=8), edematous mucosa with scarce nasal discharge in 70% (n=21) and septum deviation, severe edema and clear discharge in 3.3% (n=1) of the cases (Table 1).

Allergic rhinitis was detected in 53.3% of the cases and 46.7% (n=12) of the patients had not allergic rhinitis. Very few number of (10%) the participants had asthma, while 90% (n=27) of them had not. However, atopic dermatitis was detected only in 6.7% (n=2) of the patients. Thirteen (43.3%) patients had not experienced any allergic disease previously while 43.3% (n=13). and 33.3% (n=4) of the patients had had one and two allergic diseases, respectively (Table 3).

When the postoperative long-term symptoms of the patients were questioned, two (6.7%) patients suffered from apneic attacks and 28 (93.32%) patients had not suffered from apneic attacks. While 40% (n=12) of the patients snored; 60% (n=18) of them did not snore. The findings showed that patients did (50%: n=15) and did not (50%: n=15) sleep with open mouth. While 26.7% (n=8) of the patients had slept and 73.3% (n=22) of them had not slept frequently. Eleven (36.7%) patients had na-

Table 3. Characteristic allergic findings

	n	%
Allergic rhinitis (+)		
Yes	16	53.3
No	14	46.7
Asthma (+)		
Yes	3	10.0
No	27	90.0
Atopic dermatitis (+)		
Yes	2	6.7
No	28	93.3
Presence of allergic disease		
None	13	43.3
Present	17	56.6
1 disease	13	43.3
2 diseases	4	13.3

Table 4. Characteristic symptoms

	n	%
Apnea (+)		
Yes	2	6.7
No	28	93.3
Snoring (+)		
Yes	12	40.0
No	18	60.0
Sleeping with eyes open		
Yes	15	50.0
No	15	50.0
Frequent episodes of sleeping (+)		
Yes	8	26.7
No	22	73.3
Nasal obstruction (+)		
Yes	11	36.7
No	19	63.3
Symptomatic recurrence (+)		
No	12	40.0
Yes	18	60.0
1 symptom	5	16.7
2 symptoms	3	10.0
3 symptoms	3	10.0
4 symptoms	7	23.3

Table 5. Characteristic findings of recurrences

	n	%
Adenoid score		
1	15	50
2	6	20
3	6	20
4	3	10
Recurrence (+)		
Yes (2+3+4)	15	50.0
No	15	50.0

sal obstruction and 63.3% (n=19) of them had not nasal obstruction (Table 4).

Patients with symptomatic recurrences had one (16.7%: n=5), two (10%: n=3), three 10% (n=3), and four (23.3%: n=5) symptoms (Table 4). Endoscopic nasopharynx examination revealed adenoid vegetation Grade 1 in 50% (n=15), Grade 2 in 20% (n=6). Grade 3 in 20% (n=6), and Grade 4 in 10% (n=3) of the patients. While 50% (n=15) of the patients had and 50% (n=15) of them had not experienced recurrences (Table 5). No statistically significant difference was found between smoking, total IgE and allergic disease rates in the family in terms of symptomatic recurrence (p>0.05) (Table 6).

Table 6. Evaluation of variables in terms of symptomatic recurrence scores

	Symptomatic recurrence scores				p
	Recurrence (+) (n=18)		Recurrence (-) (n=12)		
	n	%	n	%	
Passive smoking in the family					
Yes	13	72.2	7	58.3	[a]**0.461**
No	5	27.8	5	41.7	
Total IgE (+)					
Yes	4	22.2	1	8.3	[a]**0.622**
No	14	77.8	11	91.7	
Alergic disease (+)					
Yes	11	61.1	6	50.0	[b]**0.821**
No	7	38.9	6	50.0	

[a]Fisher's Exact Test; [b]Yates Continuity Correction.

Discussion

In the literature, hypotheses have been suggested that AV may be related to allergic diseases and studies have been conducted on this subject. Especially the coexistence of allergic rhinitis and adenoid hypertrophy has been the subject of studies and frequency of coexistence of both pathologies was found to be significant (2.3.4.11). Olusesi et al. evaluated adenotonsillar hypertrophy as a combination of allergic rhinitis and atopy instead of evaluating it as an adenoid hypertrophy and argued that adenotonsillar hypertrophy showed significant association with rhinitis in atopic children [8]. In addition, a significant association was found in studies comparing all allergic diseases as one group with adenotonsillar hypertrophy (5.6.12). In studies investigating AV treatment and nasal steroids are frequently used in the treatment of allergic rhinitis and AV dimensions regress with nasal steroid use (7.10).

In the present study, allergic rhinitis, atopic dermatitis and asthma were compared regarding AV recurrence in light of the literature findings. However, in our study, literature data related to coexistence between AV and allergy were investigated in terms of coexistence between allergy, and recurrent AV and similar results could not be obtained. There was no statistically significant relationship between allergy and AV recurrence (p>0.05). In addition, as an objective parameter, the association of total IgE values with recurrent cases in the blood of patients analyzed for any reason at their previous visits was compared and no statistically significant association was found between AV recurrence and Total IgE positivity (p>0.05).

When the studies in the literature are evaluated, it is noteworthy that the knowledge that exposure to cigarette smoke increases the incidence of childhood allergic diseases is widely accepted [13–15]. Smoking by parents leads to ciliary dysfunction in children and thus increases the incidence of upper respiratory tract infections, such as chronic sinusitis and chronic otitis media. Recurrence of such infections may pave the way for the formation of adenoid hypertrophy by lymphoid tissue stimulation (16.17).

Based on the thesis that AV is an allergic disease, we thought that AV recurrence could be increased by a factor that triggers allergic reactions. When we compared the recurrent cases with the others in terms of smoking exposure, we did not find a statistically significant result ($p>0.05$).

Conclusion

When our results were evaluated, no significant relationship was found between atopy and/or exposure to cigarette smoke and AV recurrence. However, we should note that because of the small number of patients in our study, we only obtained preliminary results.

Ethics Committee Approval: Clinical Research Ethics Committee of Haydarpaşa Numune Training and Research Hospital; 22/06/2015; HNEAH-KAEK2015/48.

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