

Epidemiological Analysis in Patients with Nasal Polyposis

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SUMMARY

- Introduction:** Nasal polyps cause considerable morbidity and symptoms are related to nasosinusal dysfunction.
- Objective:** The prospective study has the objective to analyze the symptoms in patients with nasal polyps and the comorbidities that are often related to nasal polyps such as asthma and aspirin intolerance and also make a review about pertinent topics on Nasal Polyposis.
- Method:** 24 patients with nasal polyps being treated in the Department of Otolaryngology of the Hospital das Clínicas do Paraná, completed a questionnaire and computed tomography evaluation. The variables evaluated were age, sex, tabagism and aspirin intolerance, such as nasal symptoms, nasal discharge, nasal obstruction, postnasal drip, anosmia and presence or not of asthma. Computed tomography (CT) scans were classified according to the system proposed by KENNEDY et al.
- Results:** 41.66% patients were men, with a mean age of 50 to 59 (37.5%). From the 24 patients evaluated, 12.99% had asthma and 8.32% showed aspirin intolerance. Clinical symptoms such as postnasal drip, nasal discharge and anosmia were found in 90% of patients. Staging of the sinonasal disease in the CT scan revealed that most of them (45.83%) were grouped in the third stage of sinonasal disease severity (bilateral ethmoid disease with involvement of two or more dependent sinuses on each side).
- Conclusions:** This study confirms that polyposis in asthmatic patients is usually a severe disease, all asthmatic patients were grouped to the third or fourth stage of CT sinonasal disease severity.
- Key words:** nasal polyps, asthma, sinonasal disease, polyposis, acetylsalicylic acid intolerance.

INTRODUCTION

Nasal Polyposis affects from 1% to 4% of population (1,2) with more frequency in men (3,4) especially over 50 (3) and rarely affecting children and young people. When it is associated with asthma, they affect it affects more frequently females (4). Its origin is still uncertain. It is probably multifactorial, because its causes are by bacteria or structure alteration infections such as septum deviation and anatomical variations of medium meatus which causes inflammation and then Nasal Polyposis (1).

It is distinguished by an inflammatory chronic process of nasal respiratory mucosa and of paranasal sinus (1). Histologically, it presents itself with large quantity of inflammatory cells such as lymphocytes, mastocytes, basophiles with predominance of eosinophiles, and non-inflammatory cells such as fibroblasts and epithelial cells. Besides, there is presence of inflammatory mediator as cytokines and growth factors which are active in the region (1,5).

Nasal Polyposis has a high rate of morbidity besides determining an expressive impact on patient's quality of life, as mentioned in other studies (2,6,7,8). Its symptoms is related to alteration on sinusal function leading to anosmia, nasal obstruction, anterior and posterior rhinorrhea, sneezing and local itching (8,9), yet it is also related to sleeping disorders, headaches and anger. The clinical triad, Nasal Polyposis, Asthma and Aspirin Sensitiveness is a condition of morbidity, by representing the most aggressive way of the disease (3). Though, it is not completely found in all patients who suffer from Nasal Polyposis.

Nasal Polyposis should be considered as a multifactorial disease (2), as it is often associated to atopic individuals, patients with asthma, chronic rhinosinusopathy, mucocilliary motility disorder, non-steroidal anti-inflammatory sensitiveness and cystic fibrosis (3,10).

The current study evaluates patients' symptoms who suffer from Nasal Polyposis and its related co-morbidity, such as asthma and aspirin sensitiveness, and also to review some of aspects of the disease.

METHOD

A prospective study was done with 24 patients suffering from Nasal Polyposis when followed-up at *Serviço de Otorrinolaringologia do Hospital das Clínicas do Paraná*. All patients were submitted to a questionnaire and supplementary evaluation by Computed Tomography

Scan. The study was approved by *Comitê de Ética em Pesquisa em Seres Humanos* (Ethics Committee on Human Being Research) on May 11th, 2007 under #1343.008/2007-01.

Age, gender, profession, work pollutant, smoking habits and aspirin sensitiveness were evaluated, according to clinical history reported by patients. Regarding nasal symptoms, the presence or absence of them were equally evaluated, such as rhinorrhea, nasal obstruction, nasal itching and sneezing and conjunctivitis, besides hypo or anosmia complaints.

Patients with asthma were classified according to disease intensity. The ones with mild asthma reported symptoms during less than twice a week which were of short duration, with absence of night symptoms or present less than twice a month, being asymptomatic between the exacerbations. The ones with moderate asthma reported symptoms more than twice a week and more than twice a month during the night. Patients with severe asthma reported often symptoms during the day and night, previous crisis occurrence threatening their lives, limited physical activity and one hospitalization in the last 12 months at least.

Tomography evaluation of patients with Nasal Polyposis was performed according to KENNEDY *et al* (3): Grade 1: bilateral ethmoid disease. Grade 2: bilateral ethmoid disease affecting one paranasal sinus. Grade 3: bilateral ethmoid disease affecting two or more paranasal sinus. Grade 4: diffuse rhinosinusal polyposis.

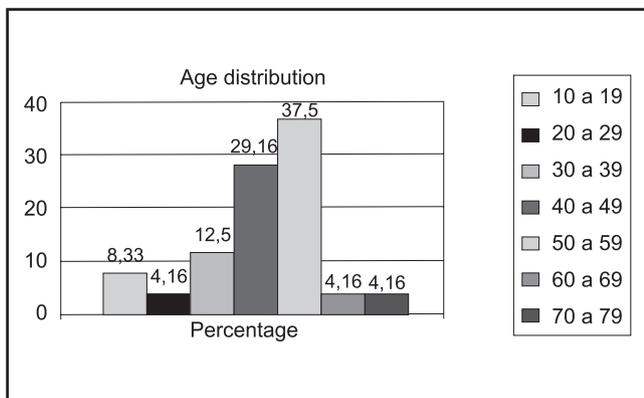
The Qui-Squared Test was applied for the statistical analysis. The value $p < 0.05$ was established as a rejection level of hypothesis of nullity.

RESULTS

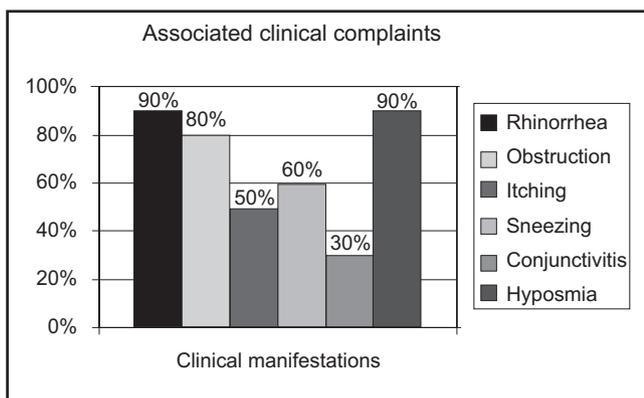
From the 24 evaluated patients, 41.66% was male. Age ranged from 50 to 59 year, corresponding to 37.5% of the cases, followed by patients aging from 40 to 49, which represented 29.16% (Picture 1). Only 12.5% (3/24) of patients presented asthma. 2 of them suffered from light asthma and only 1 suffered from moderate asthma. No patients suffered from severe asthma (Table 1).

Regarding aspirin sensitiveness, 8.33% (2/24) of patients with Nasal Polyposis reported such sensitiveness, and suffered from asthma. Regarding smoking habits, 33.33% (8/24) smoked 15 packs/year in average.

The most frequent clinical manifestations were anterior and posterior rhinorrhea and anosmia. Both were



Picture 1. Age distribution of evaluated patients with nasal polyps.



Picture 2. Symptoms in patients with nasal polyps.

present in 90% of the patients who were submitted to the questionnaire. 80% of patients reported nasal obstruction; 60% reported sneezing; 50% reported itching and 30% of them reported conjunctivitis (Picture 2 and Table 2).

Regarding tomography evaluation of the nasossinusal disease, 45.83% of patients was classified as Grade 3 (bilateral ethmoid disease affecting two or more paranasal sinus of each side), 29.16% was classified as Grade 2, and 12.5% was classified as Grade 1 and 4 respectively (Table 3). The correlation between severity of the disease by Computed Tomography Scan and clinical symptoms was statistically significant from Qui-Squared Test, with p-value = 0.04. Asthma severity was related to tomography class, as all patients were classified in grade 3 or 4 (p<0.05).

DISCUSSION

The features of the evaluated patients were similar to the ones in the literature. Patients' age ranged from 50 to 59 years (37.5%). BONFILS et al. reported an

Table 1. Asthma evaluation in patients with nasal polyps.

Symptoms	%	Observed frequency	Expected frequency	(OF-EF) ²	Alpha = 5%
Light		2	1,0000	1	Fi=2
Moderate		1	1,0000	0	
Severe		0,00	1,0000	1	
				X ² cal=2	X ² =5,99

Table 2. Symptoms in patients with nasal polyps.

Symptoms	%	Observed frequency	Expected frequency	(OF-EF) ²	Alpha = 5%
Rhinorrhea	90	22	16,0000	31,36	Fi=5
Obstruction	80	19	16,0000	10,24	X ² =11,1
Itching	50	12	16,0000	16	
Sneezing	60	14,4	16,0000	2,56	
Conjunctivitis	30	7	16,0000	77,44	
Hyposmia	90	22	16,0000	31,36	
				168,96	
				X ² cal=2	10,56

Table 3. Tomographic classification - nasossinusal disease.

Tomography	%	Observed frequency	Expected frequency	(OF-EF) ²	Alpha = 5%
Degree 1	12,5	3,00	6,0000	9	Fi=3
Degree 2	29,16	7,00	6,0000	0,99680256	X ² =7,81
Degree 3	45,83	11,00	6,0000	24,99200064	
Degree 4	12,5	3,00	6,0000	9	
				43,9888032	
				X ² cal	7,3314672

average of 49 years old and MATSUYAMA reported 50 years old.

Association between Nasal Polyposis and asthma is commonly reported in the literature (around 7% to 20% (2)). Asthma affects 45% of patients with Nasal Polyposis (11.12%). In the current study, the figure is 12.5%, what can be explained by the evaluated samples. On the other hand, Nasal Polyposis affects from 5.2% to 13% (11,12) of patients with asthma. Pathology in patients with asthma is usually more severe and refractory to treatment when compared to patients without asthma.

KLOSSER et al. (13), during a pre-surgical evaluation on patients holding Nasal Polyposis, observed a

predominance of 25.5% of asthma and of 29,7% of ASA, a clinical syndrome which is Aspirin Sensitive Asthma. The relation between ASA and Nasal Polyposis is described (14), and in most of the patients with ASA, the anterior rhinoscopy and the tomography study reveal the presence of nasal polypus (10). The high predominance of Nasal Polyposis in patients with ASA would be related to alterations on the HLA genes (2).

KLOSSEK et al. reported bilateral nasal obstruction and anosmia for 6 months in 100% of cases. In the current study, anterior and posterior rhinorrhea and anosmia affected 90% of patients.

In relation to the 8.33% of the patients who hold aspirin intolerance, we have observed that such values agree to the results obtained by BATEMAN et al, in which 5% to 10% of the patients who hold Nasal Polyposis have intolerance to Acetylsalicylic Acid.

Nasal Polypi are evaginations of the nasal mucosa that are originated from the ethmoidal sinus, medium turbinate maxillary sinus (10). Due to the frequent localization of polypi on the osteomeatal complex, the drainage and the aeration become deficient, thus frequently leading to acute clinical pictures of infection with the presence of purulent rhinorrhea, fever and night cough, among other symptoms (3).

Histologically, the nasal polypi are made of infiltrate of inflammatory cells with lymphocytes, mastocytes, basophiles – and the eosinophiles represent more than 60 % of the cells – in addition to non-inflammatory cells such as fibroblasts and epithelial cells(2). There is production of great quantity of cytokines and growth factors, which contribute to the chronic eosinophilic inflammation regulating the migration, survival and activation of eosinophiles (15). The cytokines growth factors such as interleukins 3, 4 and 5, and Interferon-gama and TGF- β 1 (β 1 factors of transgenic growth) are synthesised by lymphocytes T, fibroblasts, epithelial cells and eosinophiles. Such factors are expressed in higher or lower quantity according to individual atopy (17,18) and should be liable to different phases in the polyp formation process (1), thus characterizing different phases of Nasal Polyposes. Such interleukinas promote deposit of collagen of kind I, II and V, thus contributing for the thickening of the local basal membrane, estromal fibrosis and epithelial hyperplasia thus bringing underepithelial remodeling (1, 17, 18).

Different histological Standards of Nasal Polyposis may be found (2). The nasal polypi may be made of normal or abnormal respiratory epithelium, made of respiratory mucosa and transition epithelium areas which contain scaly cells, so undermucous glands may be present in equal or

lower quantity when compared to the nasal mucosa. Metaplastic histological standards may also be found (1, 17, 18).

Such inflammatory standard described in the Nasal Polyposis is similar to the one demonstrated in the asthma physiopathology, which proves the co-relation between both pathologies (4). The higher the remodeling due to fibrosis, the higher the severity of the disease (13, 17). Such affirmation has been proved in this study by the co-relation of tomography severity of the disease and the presence of asthma, once all patients who hold asthma were in degree 3 or 4 of the tomography classification by KENNEDY et al.

The Nasal Polyposis is also related to the metabolism of prostanoids (2,10). It has already been demonstrated that there is a delay in the activation of Ciclooxygenase-2 (COX-2) in the nasal polypi when compared to the nasal mucosa. Such fact leads to a deficiency in the production of Prostaglandines, which are involved with the modulation in the nasal mucosa. The deficiency in its production would be a reason for the polypi formation (2).

It has been demonstrated that in patients with ASA the COX-2 levels produced by nasal polypi are even smaller than in nasal polypi of patients who hold aspirin tolerance, thus demonstrating that the lack of prostaglandins in such patients makes them more sensitive to non-steroidal anti-inflammatory drugs effects (2).

The complementary evaluation through CT scan is practically obligatory (3) for all patients with Nasal Polyposis, which provides the inference based on the classification used the degree of morbidity and severity of the disease, in addition to its extent.

KEREM et al. report that among patients holding Nasal Polyposis in his pre-operative study of endoscopy surgery, 94.2% remained in the levels 3 or 4 of tomography sinus disease severity (15). In the present study, 58.7% of the patients belonged to the groups 3 or 4 according to the tomography evaluation.

CONCLUSION

Although Nasal Polyposis is a frequent disease, its etiology is still unknown. The presence of eosinophilia, mastocyte degranulation and high levels of IgE in its histopathological evaluation suggest an allergic component in its etiology. The association between polyposis and asthma and aspirin intolerance is already recognized. The present study suggest the co-relation between the polyposis severity and its association with asthma, once all patients holding asthma were found in levels 3 or 4 of the

tomography classification by KENNEDY et al. However, due to the small sample size, all studies which possibly confirm such findings are necessary.

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