

Risk Factors Associated With Sino-Nasal Polyposis And Its Relationship With The Occupational Inhalants

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ABSTRACT:

Objective: To determine the risk factors associated with sino-nasal polyposis and its relationship with the exposure of occupational inhalants in patients presenting in a tertiary care hospital of Karachi.

Study design and Settings: Cross-sectional study conducted at department of otorhino-laryngology Karachi Medical & Dental College and Abbasi Shaheed Hospital Karachi for a period of two and a half years from October 2015 to April 2018.

Methodology: Total number of patients included for this study were 221 patients with diagnosis of bilateral and multiple nasal polyposis with age greater than 10 years. Specifically, designed proforma was used for data collection specially in relation with occupation and exposure to different occupational inhalants and entered in SPSS version 23 for analysis.

Results: There were 133 male and 88 female patient with a mean age was 36.16 ± 12.33 years. Mostly patients belonged to poor socio-economic status i.e. 133 (60.70%). Allergic rhinitis or nasal allergy was the most common risk factor present in 114 patients (51.6%) while aspirin hypersensitivity was the least common risk factor present in only 19 patients (8.5%). Most of the patients (76 or 34.4%) were related with one or the other form of agriculture and were exposed to different occupational inhalants like mud, pollens, animals and plants.

Conclusions: Nasal allergy is the most common risk factor and occupational inhalant specially related with agriculture, poultry and pets are the common agents responsible for nasal polyposis in our local population.

Key words: Nasal polyps, nasal obstruction, risk factor

INTRODUCTION:

Nasal polyps are the chronic inflammation of the mucous membrane of para-nasal sinuses and nose¹ and severely affects the normal life of patients causing nasal obstruction and altered sense of smell. These are the benign lesion that develops due to marked extracellular edema of the mucosa of the nose and sinuses² being most commonly arise from the middle meatus or the ethmoid area³. Clinically it presents as rounded or pear shaped soft pedunculated, semi translucent, yellow or pale glistening mass projecting in the nasal cavity, which are insensitive and rarely bleed on touch⁴. Overall it effects 4% of the general population⁵ but in a cadaveric study, prevalence of nasal polyps was reported up to 40%⁶. It usually descends between the lateral wall of nose and middle turbinate causing nasal obstruction, nasal congestion, hyposmia, rhinorrhea, facial pain⁷, post nasal drip and sleep disturbance⁸.

The exact etiology is still unknown⁹ but there are some etiological factors associated with it like nasal allergy, chronic inflammation of mucosa of nose or paranasal sinus, genetic predisposition and autonomic nervous dysfunction¹⁰. Up to one third of these patients have history of asthma while polypi are found in 7% of the asthmatic patients⁵. The treatment of the nasal polyps is challenging for the otorhinolaryngologist, because etiology is not clear and tendency for recurrence is high. Recurrence can be prevented by proper control of the nasal allergy and avoidance from exposure to all allergens responsible for development of nasal polyposis. Nasal polyposis in Western populations is often characterized by type 2 inflammation, with elevated levels of type 2 cytokines, such as IL-5 and IL-13, along with eosinophilia. However, patients of Asian countries, are characterized by a mixed type 1 or type 3 inflammation, with a more neutrophilic inflammation¹¹. The mechanisms that drive these different phenotypes are unclear at this time. The paranasal sinuses of patients with nasal polyposis are often chronically colonized with fungi and bacteria and these microbes may play an important role in pathogenesis of nasal polyp¹². Although there are numerous hypothetical mechanisms that could account for this colonization, it is not yet clear whether this accumulation of microbes is an initial cause of nasal polyposis or a downstream effect of the underlying inflammatory disease mechanism.

This study was done with the intention to find out the risk factors associated with the formation of nasal polyposis along with its relationship with the exposure of occupational inhalants in local population.

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METHODOLOGY:

This study was conducted in the department of Otorhinolaryngology of Karachi Medical and Dental college and Abbasi Shaheed Hospital Karachi, over a period of two and half years, from October 2015 to April 2018. A total of 221 cases of nasal polyposis were included in the study. The sample size was calculated with confidence level of 95% and prevalence of 17% in general population. The inclusion criterion was all consecutive patients presenting to the hospital’s outpatient department with the diagnosis of nasal polyposis having age greater than 10 years. The exclusion criteria were patients with antro-choanal polyp (single and unilateral), patients younger than 10 years of age and patients on whom surgical intervention had been done previously.

Complete history along with clinical examination of ear, nose, throat and general examination was done in every patient. Eyes and Neurosurgical opinion were taken for any orbital and intracranial involvement. The occupation of the patients and exposure to different occupational inhalants was specifically noted. Routine baseline laboratory investigations and plain CT scan in all three planes were also done in every patient. All the required information was gathered in a specially designed proforma and entered with SPSS version 23.

RESULTS:

A total number of 221 patients were included in this study where male were 133 (60.01%) and female were 88 (39.81%) with male to female ratio of 1.5:1. Figure. 1 shows distribution of patients in different gender and age groups. The highest number of patients were noted between the ages of 21-40 years i.e. 104 patients (47.05%) followed by 41-60 years, 67 patients (30.31%). Only 15 patients (6.78%) were between the age of 11 to 20 years and 35 (15.8%) were above the age of 61 years. Most of the patients belonged to poor socio-economical status i.e. 133 (60.70%) while 64 (28.9%) were middle class and only 24 (10.8%) were of good socio-economic status.

Table 1 shows the different risk factors present in these patients. Out of 221 total patients, 116 patients (52.5%) had only one risk factor present while 95 patients (43.0%) had at least two risk factors and 10 patients (4.5%) had three or more risk factors. Allergic rhinitis or nasal allergy was the most common risk factor present in 114 patients (51.6%) while aspirin hypersensitivity was the least common risk factor present in only 19 patients (8.5%).

Figure.2 depicts the occupations and exposure to different occupational inhalants related with that occupation in these patients. In our study, most of the patients (76 or 34.4%) were related with one or the other form of agriculture and were exposed to different occupational inhalants like mud, pollens, animals and plants. The second common occupation in our series was poultry workers (39 patients, 17.6%) and

Figure. 1 Age and Gender Distribution (n=221)

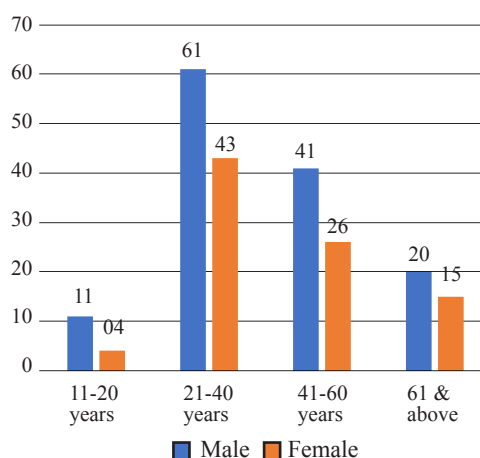
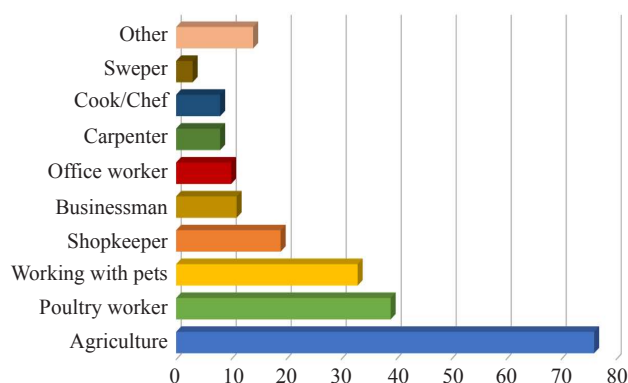


Table 1: Risk Factors Associated With Nasal Polyposis (n = 221)

Risk factor	Number of patients	Percentage
Allergic rhinitis	114	51.6%
Asthma	27	12.2%
Aspirin Hypersensitivity	19	8.5%
Nasal allergies in family	60	27.10%
Bronchial asthma in family	63	28.50%
Chronic Rhinosinusitis	57	25.8%

Figure. 2: Occupation of the patients (n = 221)



exposed to chickens and other related items. Another common occupation was related with exposure to pets in 33 patients (17.6%).

DISCUSSION:

Nasal polyposis and other associated diseases like allergic rhinitis and asthma, severely impair the quality of life of the patients, and represent imperative problems to the physician both from diagnostic and therapeutic points of view¹³. Scientific studies have been made to recognize and differentiate the pathophysiology of these conditions, but to date most of the aspects are still unclear and uncertain. Therefore, increasingly complex diagnostic and instrumental

methods are required for diagnosis and management where a detailed diagnosis allows to characterize and optimally treat these nasal diseases.

Nasal polyposis affects more male as compared to female with a male to female ratio varying from 1.3 to 2.2¹⁴. In our study also, male were 133 (60.01%) and female were 88 (39.81%) with male female ratio was 1.5:1. Nasal polyps are common in 4th to 7th decade of life¹⁵ with a peak incidence between the ages of 45 and 65¹⁶. The highest numbers of patients in our study were between the ages of 21-40 years of age which was 104 (47.05%) patients and followed by patients between the ages of 41-60 years of age which were 67 (30.31%). Another study shows maximum prevalence of polyps was noted between 31 and 40 years of age¹⁷, fairly similar to our study. Only 15 patients (6.7%) were below the age of 20 as according to most studies nasal polyps are usually uncommon under the age of 20 years.¹⁸ In this age group, it is frequently associated with cystic fibrosis, asthma and aspirin sensitivity.

Chronic nasal and sinus infection is also a risk factor of nasal polyposis¹⁹. In our study we found 25.8% patients had history of chronic rhino-sinusitis. One of the reasons is that inflammation of one part of respiratory tract may affect the other side of the respiratory tract at a distance¹⁹ because upper and lower airways both are continuous. History of asthma in patient was present in 12.2% cases. According to one study, sinus radiograph findings show that asthmatic patients have high chance of abnormal sinus mucosa²⁰. One study showed that mild to moderate asthmatic patients who are on steroid therapy have abnormal mucosal changes on CT scan²¹. 51.6% cases of this study had positive history of allergic rhinitis in the patients. According to Nanda et al. study, 33% patients found positive history of allergic rhinitis²². According to one study, 7.4% patients had positive family history of allergy or asthma²³. Our study also found history of nasal allergy and bronchial asthma in family members in 27.10% and 28.50% respectively. Genetic predisposition for nasal polyposis has been studied and suggested but still controversies exist and the matter is still unproven.²⁴ Only limited work has been done in relation with nasal polyposis and occupational inhalants and no significant local study was found on literature search. In our study certainly nasal polyposis was found to be related with occupation and occupational inhalants. Agriculture related exposure was present in 76 cases while exposure with birds, chicken and other pets was found in 72 patients. All such occupational exposures are well known associated with nasal allergy and chronic rhino-sinusitis.

The limitations of this study is that it was conducted in only one tertiary care hospital of Karachi and the catchment area of this hospital is limited. Further multicenter studies involving different areas of Pakistan are needed with a greater number of patients.

CONCLUSION:

It was concluded that nasal allergy is the most common risk factor and occupational inhalant specially related with agriculture, poultry and pets are the common agents responsible for nasal polyposis in our local population.

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