

Original Article

Association of Nasal Polyposis with Bronchial Asthma

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Abstract:

Objective: To find out association between Nasal polyposis and bronchial asthma.

Methods: This was a cross sectional study which was carried out in the departments of Otolaryngology and Head-Neck surgery of Bangabondhu Sheikh Mujib Medical University and Dhaka Medical College Hospital during the period of February 2014 to July 2014. A Total 230 patients were selected according to selection criteria among which 30 subjects had nasal polyposis (designated as group A or cases) and 200 subjects had no nasal polyposis (designated as group B or control group).

Results: In group (A), asthma was found in 30.0% cases. On the other hand, asthma was found in 2.5% of control group (B). The association of nasal polyposis with bronchial asthma was highly significant ($p < .05$). In both group 40.0% patients were within the 38-47 year's age group. In case group, 80.0% patients had any sorts of allergic history on the other hand, only 15.0% patients had allergic history in control group. High eosinophil count was found 66.7% patients suffering from nasal polyposis with bronchial asthma and in comparison to patients suffering from nasal polyposis without bronchial asthma had high eosinophil count 42.85%. In group A High IgE level was found 66.7% patients suffering from nasal polyposis with bronchial asthma, on the other hand, 42.85% had IgE level among patients suffering from nasal polyposis without bronchial asthma.

Conclusion: Patients with nasal polyposis and asthma are significantly associated. Both serum IgE and total circulating eosinophil count are significant associated with nasal polyposis and bronchial asthma

Key words: Nasal Polyposis , Bronchial Asthma

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Introduction:

Nasal polyposis and bronchial asthma both are the diseases of respiratory system. We found some of the patients of nasal polyposis who are simultaneously suffering from bronchial asthma. Bronchial asthma present before or after presentation of nasal polyposis or both the disease may simultaneously. In literature and books, it is also described that there is a link between nasal polyposis and bronchial asthma.

Nasal polyp is an oedematous mucous membrane which forms a pedunculating process with a slim or broad stalk or base which originate around the openings to the ethmoidal sinuses. Nasal polyposis consisting of recurrent, multiple polyps, is part of an inflammatory reaction involving the mucous membrane of the nose, paranasal sinuses and often the lower airways. Whether allergy is a cause of nasal polyposis is a controversial issue. The fact that polyps are characterized by mast cell degranulation and high local levels of IgE and histamine and that there is an eosinophil dominated inflammation driven by cytokines, is compatible with an allergic aetiology. Although Nasal polyposis is a disease of unknown aetiology.¹

Prevalence of nasal polyposis is variable in different countries and also in different literature and books. The prevalence rate of nasal polyposis is about 2%. It increases with age, reaching a peak in those aged 50 years and older. The male and female ratio is about 2:1. Frequency of nasal polyps are found in various diseases like Allergic rhinitis, Non allergic rhinitis, Asthma in adults, NSAIDs intolerance, Allergic fungal rhinosinosis, Churg-Strauss syndrome, Cystic fibrosis, Primary ciliary dyskinesia.²

Bronchial Asthma is defined as a chronic inflammatory disorder characterized by reversible airflow obstruction causing, cough,

wheeze, chest tightness and shortness of breath. Inflammation of the bronchial wall involving eosinophils, mast cells and lymphocytes, together with cytokines and inflammatory products of these cells induces hyperresponsiveness of the bronchi so that they narrow more readily in response to a wide range of stimuli. Prevalence of asthma in case of children is 15% and 2-5% in case of adults.³

Rhinosinuitis and asthma represents the most important link of one disease in different organs. The involvement of maxillary, anterior ethmoidal and frontal sinuses draining via the ostiomeatal complex may result in chronicity and severity of bronchial asthma. Subjects treated with antihistaminics in addition to antibiotics and steroids have shown significant and faster relief of asthma symptoms. Present study undertaken to know predisposition of sinus involvement in 50 asthmatic patients.⁸

Asthmatic patient with nasal polyposis have been reported to have a high prevalence of bronchial hyper responsiveness and a worsening of quality of life.⁵

A number of patients who have asthma often have nasal polyps, but what is the link between nasal polyps and asthma? Although doctors have discovered the general cause of nasal polyps, its main cause is still unknown.⁶

In Bangladesh bronchial asthma and nasal polyposis both are common health problem due to increasing urbanization, air-pollution, malnutrition, and respiratory allergens. Both of these diseases have a detrimental effect on national health & economy, poor school performance and social problem in case of children. But in our country still there is lacking of enough literature and study to find the pathophysiology, serum markers that can ascertain the association between nasal

polyposis and bronchial asthma. If association of nasal polyposis with bronchial asthma is found, treatment and prevention of both the diseases are possible by common therapeutic approach.

Objectives

- To find out clinical presentation and complication of nasal polyposis with bronchial asthma
- To find any association between type of nasal polyposis and bronchial asthma.

Methods:

Study design: Retrospective study (Case control) **Study period:** The total period of study was 6 months (February 2014 to July 2014).

Place of study: The study was done in the indoor and outdoor patients in department of otolaryngology and head-neck surgery, Bangabandhu Sheikh Mujib Medical University and Dhaka Medical College Hospital.

Study population:

- **Case:** Patients having nasal polyposis of all age and sex
- **Control:** Participants of comparable age, sex, habitat, occupation, socio-economic status who are the attendant of admitted patients .

Sample size: 230 participants.

Sampling technique: Purposive sampling technique was adopted. All the available subjects during the data collection period who fulfilled the study selection criteria were included in the study.

Data collection instrument : A semi-structured questionnaire was developed. The questionnaire was developed using the selected variables according to the specific objectives. The questionnaire contained questions related to: 1) socio-demographic characteristics, and 2) illness characteristics and other relevant information about nasal

polyposis and asthma. A check list section was also developed. Prior to original data collection, a pre-test session was conducted. Necessary modification was done before finalized the questionnaire.

Data collection technique: Data were collected on variables of interest by interview, clinical examination and selected laboratory investigation. The interview was conducted anonymously as far possible.

Data analysis: After collection all the data were checked and edited. Then data were entered into computer with the help of software SPSS 16 version. After frequency run, data were cleaned and frequencies were checked. An analysis plan was developed keeping in view with the objectives of the study χ^2 analysis was done to see the strength of association.

Results:

A cross sectional study was done to find out the association of nasal polyposis with bronchial asthma. A Total 230 subjects were selected according to selection criteria among which 30 subjects had nasal polyposis (designated as group A or cases) and 200 subjects had no nasal polyposis (designated as group B or control group).

Table-I
Proportion of Bronchial asthma among study subjects

Bronchial Asthma	Group A (case=30) Frequency (%)	Group B (control =200) Frequency (%)
Present	9 (30.0)	5(2.5)
Absent	21 (70.0)	195(97.5)
Total	30(100.0)	200(100.0)

Table-I shows the proportion of asthma among cases and control group. In group A, 30% asthma was found. On the other hand, 2.5% asthma was found in group B.

Table II
Association of nasal polyposis with bronchial asthma

Study population	Bronchial Asthma		Total	X ²	df	P value
	Present	Absent				
Group A or case (n=30)	9 (30.0%)	21 (70.0%)	30 (100.0%)	34.51	1	.001
Group B or Control	5 (2.5%)	195 (97.5)	200 (100.0%)		(n=200)	
Total	14 (6.1%)	216 (93.9%)	230(100.0%)			

S= significant, df=1,

The association of nasal polyposis with bronchial asthma was highly significant. (p<.05)

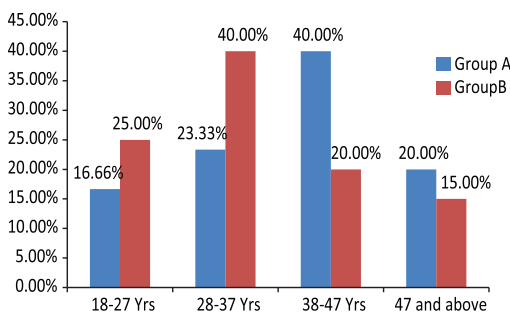


Fig.-1: Age group distribution

Figure 1 shows the age distribution among study subjects. In case group, 40.0% patients were within the 38-47 years age group. Only 16.00% patients were 18-27 years age group. In control group, 40.0% patients were within 38-47 years age group. Only 15.0% patients were within 47 and above year age group.

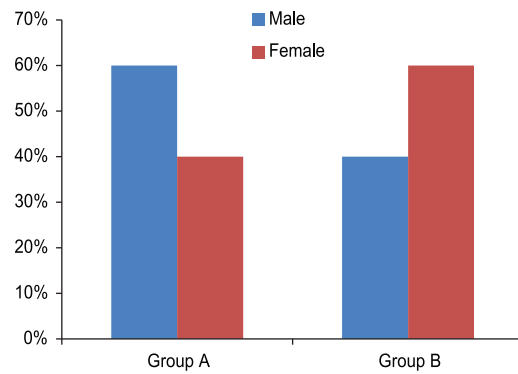


Fig-2 : Sex distribution

Figure 2 shows the sex distribution of the study patients. In case group, male were 60.0% and rest were female 40.0%. In control group, female was 60.0% and male 40.0%.

Table III
Occupational status among study subjects

Group	Age group	Frequency (n)	Percent (%)
Group A or case(n=30)	Housewife	5	16.6%
	Services	7	23.3%
	Business	12	40.0%
	Student	6	20.0%
	Total	30	100.0%
Group B or Control(n=200)	Housewife	80	40.0%
	Services	50	25.0%
	Business	30	15.0%
	Student	40	20.0%
	Total	200	100.0%

Table 3 shows that 40.0% patients were involved in business followed by services 23.3% in cases. Housewives and students were almost same by occupation. In control group, about half of the participants were housewives followed by services. Only 15.0% patients were involved in business.

Table IV
Allergic history among study subjects.

Group	Allergy history	Frequency (n)	Percent (%)
Group A or case(n=30)	Present	24	80.0%
	Absent	6	20.0%
	Total	30	100.0%
Group B or Control (n=200)	Present	30	15.0%
	Absent	170	75.0%
	Total	200	100.0%

In case group, 80.0% patients had any sorts of allergic history on the other hand, only 15.0% patients had allergic history.

Table V
Total Circulating Eosinophil count among patients suffering from nasal polyposis with bronchial asthma and nasal polyposis without bronchial asthma

Group	Circulating Eosinophil count	Frequency (n)	Percent (%)
nasal polyposis with bronchial asthma)	High	06	66.7%
	Normal	03	33.3%
	Total	09	100.0%
nasal polyposis without bronchial asthma	High	09	42.8%
	Normal	12	57.5%
	Total	21	100.0%

High Eosinophil count was found 66.7% patients of nasal polyposis with bronchial asthma and in comparison to nasal polyposis without bronchial asthma had high Eosinophil count 42.8%.

Table VI
Association between nasal polyposis with or without bronchial asthma by total circulating Eosinophil count

Group	E level			X2	df	p
	High	Normal	Total			
Nasal polyposis with bronchial asthma	6 (66.7%)	3 (33.3%)	9(100.0%)	3.81	1	<.05
Nasal polyposis without Bronchial asthma	6 (28.5%)	15(71.425)	21(100.0%)			
Total	12(100.0%)	18(100.0%)	30(100.0%)			

The association between nasal polyposis and total circulating eosinophil count were significant (p<.05).

Table VII

IgE level among patients suffering from nasal polyposis with bronchial asthma and nasal polyposis without bronchial asthma.

Group	IgE level	Frequency (n)	Percent (%)
Nasal polyposis with bronchial asthma	High	6	66.70
	Normal	03	56.66
	Total	09	100.00
Nasal polyposis without bronchial asthma	High	09	42.85
	Normal	12	57.15
	Total	21	100.00

High IgE level was found 66.70% patients having nasal polyposis with bronchial asthma on the other hand 42.85% had high IgE level patients suffering from nasal polyposis without Bronchial asthma.

Table VIII

Association of IgE level among patients suffering from nasal polyposis with bronchial asthma and nasal polyposis without bronchial asthma

Group	IgE level			χ^2	df	p
	High	Normal	Total			
Nasal polyposis with bronchial asthma	6(66.7%)	3 (33.3%)	9(100.0%)	3.81	1	<.05
Nasal polyposis without Bronchial asthma	9(42.85%)	12(57.15%)	21(100.0%)			
Total	12(100.0%)	18(100.0%)	30(100.0%)			

The association between nasal polyposis and IgE was significant ($p < .05$).

Discussion

In my study, among patients of nasal polyposis, bronchial asthma was found in 30% cases. The association of nasal polyposis with bronchial asthma was highly significant ($p < 0.05$). The historic triad of bronchial asthma, nasal polyposis and intolerance to aspirin and related chemicals, recently designated as samter's syndrome, is an inflammatory condition of unknown etiology and pathogenesis which was described by Zeitz HJ⁹. Similar type of study done by Claus Bachert, Joke Patoa, Paul Van Cawenberge found in patients with nasal

polyposis, approximately 30% have asthma and 15% had aspirin-intolerance.⁸ So, all these studies support the association of nasal polyposis with bronchial asthma which we also found in our study. The incidence of asthma in our study was 2.5% Bousquet J; Bousquet PJ; Godard P; Daures JP stated that the prevalence of asthma in different countries has been considered to range from 1% to 18% of the population.⁷

In our study in case of nasal polyposis, male: female ratio is 1.5:1 which was almost similar to study done by Claus Bachert where male:female ratio was 2:1⁴

In this study 40% patients of nasal polyposis was between 38-47 years group. In a study done by Ahmad Meymane Jahromi found that nasal polyposis affects men 60.3% more frequently, at a mean age of 39.5 years. But in another study the prevalence rate of nasal polyposis is about 2%.

In my study distribution of occupation shown that 40.0% patients were involved in business followed by services 23.33% in cases. Housewives and students were almost same by occupation. In control group, about half of the participants were housewives followed by services. Only 15.0% patients were involved in business. Another study done by Shah kamal and found that most of patients farmer 50.0%, followed by house wife 20.0%, industrial workers 10.0%, students 10.0%, service holders 10.0%. This reflects the fact that 80% of our population lives on agriculture and majority of patients coming from that group.¹⁰ Different literature suggested the association of occupation with nasal polyposis and bronchial asthma.

In my study in case group, 80.00% patients had any sorts of allergic history on the other hand, only 15.00% patients had allergic history in control group. A study done by F Muñoz del Castillo et al and found that nasal polyposis is highly prevalent in the general population. Its exact origin is unknown, although several factors are involved in the etiology and development of this condition. In a study Mohesh Chandra Hegde found that positive history of allergy was obtained in 40.4% of patients in study group.

In this study we found the association between nasal polyposis and total circulating eosinophil count were significant ($p < .05$). High eosinophil count was found 66.7% patients having nasal polyposis with bronchial asthma on the other hand 42.85% had high eosinophil count patients suffering from nasal polyposis

without Bronchial asthma. In other study done by Sudha S Deo found that the correlation of nasal polyposis and the percentage of eosinophils, WBCs, and total IgE in different groups. Total IgE was considered as a significant marker of allergic condition which increased in all age groups when compare to normal healthy control group. On comparison of increased percentage of eosinophil with total IgE by pearsons correlation, they found significant correlation in allergic rhinitis group ($p < .001$).

The association between nasal polyposis and serum IgE level were significant ($p < .05$). High IgE level was found 66.7% patients having nasal polyposis with bronchial asthma on the other hand 42.85% had high IgE level patients suffering from nasal polyposis without Bronchial asthma. Studies conducted by Sudha S Deo found that normal levels of IgE were relatively higher than that found in Western countries. The normal levels of IgE in our group of 25 healthy individuals being (180.96 + 22.16 IU/ml). This high incidence of IgE in our city could be due to higher incidence of parasitic infection as well as environmental pollutants that may be allergic to such atopic patients.⁷⁸ Sudha S Deo also describes the correlation analysis of the percentage of eosinophils, WBC counts and total IgE in different groups. Total IgE which has been considered as a significant marker of allergic conditions is found to be increased in all the groups when compared to normal healthy controls ($> 180.96 + 22.16$ IU/ml). On comparison of increased percentage of eosinophil with total IgE by Pearson's correlation, we found significant correlation in allergic rhinitis group with a $p < 0.001$.¹¹

Conclusion:

Nasal polyposis and bronchial asthma both are the pathological condition affecting the respiratory system. Both of them have some

common aetiological factors. Some mechanisms regarding the aetiopathogenesis of both the diseases are also similar. These two diseases are associated possibly by allergic history, eosinophilia and IgE. So, presence of any disease either nasal polyposis or bronchial asthma we should consider treatment for both upper and lower respiratory system.

Limitations of the study:

Although optimum care had been tried by the researcher in every steps of this study, still some limitations existed:

- The study was conducted in a selected area. So the study population might not represent the whole community.
- Probability sampling technique could not be employed to recruit the study unit; they were selected purposively. As a result, there might be some selection bias.
- In spite of maximum effort by the researcher due to time and resource limitation sample size was too small; a larger sample size would have given a better result.

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