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RESEARCH STUDY TO DETERMINE THE OCCURRENCE OF RHINOSINUSITIS IN PATIENTS WITH BRONCHIAL ASTHMA AND / OR ALLERGIC RHINITIS[1]

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INTRODUCTION

The clinical association of the upper and the lower airways is well recognised. Nasal symptoms have been reported to occur in 28-78% of asthmatics while 17-38% of patients with allergic rhinitis have coexistent asthma. Both these conditions hamper day to day functioning of the patients and adversely affect the quality of life. Involvement of the paranasal sinuses (PNS) too in patients with asthma and/or rhinitis has been highlighted. Sinusitis is considered an important trigger factor for asthma, and optimal control of sinusitis would help in preventing frequent exacerbations of asthma. Since sinusitis is more often than not associated with nasal symptoms, the Task Force on Rhinosinusitis by the American Academy of Otorhinolaryngology - Head and Neck Surgery proposed the use of the term "rhinosinusitis" instead of "sinusitis". Evidence is accumulating that there may be a cause-and-effect relationship between rhinosinusitis and asthma. It has been postulated that the two are linked by eosinophilic inflammation of nasal and lower airway epithelium. Rhinosinusitis was seen in 74% of patients with severe steroid dependent asthma and 70% with mild to moderate asthma also had evidence of rhinosinusitis. A significant improvement in symptoms of asthmatic children was reported after they were prescribed appropriate treatment for rhinosinusitis.

The Rhinosinusitis Task Force has provided recommendations for diagnosis and management of rhinosinusitis. The diagnosis of rhinosinusitis is established clinically by facial pressure or pain, nasal obstruction, discharge or purulence, and hyposmia or anosmia, fever, halitosis, fatigue and dental pain. For the radiological diagnosis of sinus involvement, coronal computed tomography (CT) of the PNS has emerged as an important diagnostic tool as compared to plain radiography (Water's view) . The visualization of the severity of disease on CT has enabled investigators to develop different staging systems for rhinosinusitis.

[1] *How to cite the article:* Katariya P.K., Study of Various Techniques Used in Diagnosis of HIV Infection, *IJPPS*, Oct-Dec 2017, Vol 1, Issue 1, 24-30

Asthma is treated by the pulmonologist, while sinusitis is dealt with by the otorhinolaryngologist. Under these circumstances, it is quite possible that clinicians looking after one end of the airway may possibly overlook the morbiditiy at the other end. In light of the above and in view of the paucity of data from India, this study proposes to determine the occurrence of rhinosinusitis in patients with bronchial asthma and / or allergic rhinitis. A CT – PNS staging system will be used to assess the extent of sinus involvement in these patients.

REVIEW OF LITERATURE

Asthma, rhinitis and sinusitis

According to the Global Initiative for Asthma (GINA) guidelines, asthma is defined as a chronic inflammatory disorder characterized by airway hyper responsiveness that leads to recurrent episodes of wheezing, breathlessness, chest tightness, and coughing, particularly at night or early morning. The Practice Parameters on diagnosis and management of rhinitis have defined rhinitis as inflammation of the membranes lining the nose, which is characterized by nasal congestion, rhinorrhoea, sneezing, itching of the nose and/or postnasal drainage. Many patients with allergic rhinitis have concomitant asthma, and most asthmatics have coexistent allergic rhinitis. Sinusitis is a common comorbid condition in patients with asthma and rhinitis, and can provoke both the disorders. The recently formulated Allergic Rhinitis and its Impact on Asthma (ARIA) workshop report also considered sinusitis as an important co-morbidity of rhinitis.

In 1997, the Task Force on Rhinosinusitis by the American Academy of Otorhinolaryngology - Head and Neck Surgery developed a detailed definition of “rhinosinusitis” and proposed that this term is usually more accurate than “sinusitis”, since sinusitis is virtually always preceded or accompanied by rhinitis. Furthermore, it was believed that use of the term “rhinosinusitis” would help to educate physicians and the lay public that the nasal passages, as well as the sinuses are involved with the disorder. Symptomatology of rhinosinusitis was categorized into major and minor symptoms. Major includes headache, facial pain and pressure, nasal congestion; thick coloured postnasal drip and olfactory disturbances. Minor symptoms include fever, halitosis and presence of cough and irritability in children only. On the basis of duration of these symptoms, they gave the consensus opinion on the definition of sinusitis and presented the *working definitions* for acute rhinosinusitis, sub acute rhinosinusitis, recurrent acute rhinosinusitis, chronic rhinosinusitis and acute exacerbation of chronic rhinosinusitis. Chronic rhinosinusitis was defined as inflammation of the nasal cavity and paranasal sinuses, the fluids within these cavities, and/or the underlying bone that has been present with or without treatment for at least 12 weeks.

de Benedictis and Bush, discussed about the coexistence of rhinosinusitis and asthma. Sinusitis and asthma are also frequently associated in the same patient, but doubt still remains whether a causal relationship exists wherein sinusitis worsens bronchial asthma, or whether they are manifestations in

different parts of the respiratory tract of the same underlying process. They furtherstated that in patients with rhinosinusitis and asthma, the main goal of therapy could only be better control of nasal symptoms and eventually a reduction in asthma medications.

In 2001 Bhattacharyya, evaluated paired specimens of nasal septum mucosa and ethmoid sinus mucosa in a prospective cohort of 42 patients undergoing endoscopic sinus surgery for chronic rhinosinusitis. There was histopathologic evidence that rhinitis was associated with chronic sinusitis.

In 2004, the American Academy of Otorhinolaryngology - Head and Neck Surgery and Journal of Allergy and Clinical Immunology published a consensus document for officially adopting the term "rhinosinusitis" over "sinusitis". For this reason and in the interest of creating consistency rather than confusion the expert panels from United States strongly recommends uniform use of the term "rhinosinusitis".

In a recently published editorial, Hamilos DL et al, discusses about the use of the term "rhinosinusitis" over "sinusitis". The concurrent use of both terms increases confusion among primary care physicians and ear,nose and throat specialist. The term "rhinosinusitis" highlights the complexity of this clinical condition. Coexisting nasal inflammation can manifest themselves with similar symptoms and can participate in the diffuse problem of rhinosinustis. Interestingly, data have emerged since 1997 that support the use of the term "rhinosinusitis".

MATERIALS & METHODS

A total of 216 patients, irrespective of gender, with a clinical diagnosis of bronchial asthma and / or allergic rhinitis, between the ages of 15-50 years, who had been recently registered with the out patients department of the Clinical Research Centre of the Vallabhbhai Patel Chest Institute, Delhi, were included in the study.

PATIENTS INCLUSION CRITERIA:

1. Age group 15-50 years, irrespective of gender.
2. Patients with a clinical diagnosis of bronchial asthma[13] and / or allergic rhinitis[15].
3. Patients relatively stable, ambulatory and cooperative.

PATIENTS EXCLUSION CRITERIA:

1. Patients currently using oral steroids.
2. Patients with any other systemic disorder viz. diabetes mellitus, rheumatic heart disease, CNS disorders, etc.
3. Pregnant and lactating females.

4. History of use of astemizole within past 12 weeks.

A detailed medical history and thorough clinical examination, with special focus on upper and lower respiratory system, was done. Specific otorhinolaryngological examination was requested for, wherever required.

Informed written consent was obtained from all patients.

INVESTIGATIONS

A) Following routine clinical investigations were done:

Blood haemoglobin, total leuckocyte count, differential leuckocyte count, ESR.

2. Urine routine and microscopic examinations.
3. Roentgenograms - PNS: occipitomental (Waters') view

- Chest: postero-anterior view

4. Computed tomography - PNS (coronal section)
5. Spirometry measurement of:

- forced vital capacity (FVC)
- forced expiratory volume in one second (FEV1)
- FEV1 / FVC ratio

6. Skin allergy testing to common aeroallergens
7. Serum IgE levels

B) Relevant investigations like sputum examination, liver function tests, kidney function test, serum electrolytes, and blood sugar were done, as and when required.

STUDY DESIGN

A total of 216 patients were enrolled. Bronchial asthma was diagnosed, according to the GINA guidelines[13], as an improvement of at least 12% in FEV_1 after inhalation of 200 mcg of salbutamol. Allergic rhinitis was diagnosed, according to the ARIA workshop report[15], as presence of 2 or more of the following symptoms for more than an hour on most days: rhinorrhoea, nasal blockage, sneezing and nasal itching.

Rhinosinusitis was diagnosed, as defined by the presence of symptoms of nasal congestion or obstruction, nasal discharge, headache, facial pain or pressure, or hyposmia for more than 12 weeks[7] and relevant clinical examination. All patients were asked to undergo CT – PNS for evaluation of rhinosinusitis. A CT staging system[18] for noting the extent of rhinosinusitis was adopted, as given below:

- Each sinus group graded as 0 (no abnormality), 1 (partial opacification), and 2 (total opacification).

- The ostiomeatal complex scored only as 0 (not occluded) or 2 (occluded).
- The total score range from 0 to 24, and each side can be considered separately (0 to 12). Anatomic variants noted as absent (0) or present (1), but will not contribute to the scan score. Variants include concha bullosa, paradoxical middle turbinates, infra-orbital ethmoid cells (Haller's cells), everted uncinate processes, agger nasi pneumatisation, or absence of the frontal sinus.

RESULTS AND OBSERVATIONS

The study comprised *216* consecutive patients who were registered in the outpatient clinic of the VPCI with a diagnosis of bronchial asthma and / or allergic rhinitis. These patients were further divided into 3 groups.

Group 1 consisted of patients with a diagnosis of bronchial asthma alone and it included 27 [12.5%] patients. Group 2 consisted of patients with a diagnosis of bronchial asthma and allergic rhinitis and included 58 patients [26.5%]. Group 3 consisted of patients with a diagnosis of allergic rhinitis alone and included131 patients [60.64%]. A questionnaire was filled for all patients by the same investigator.

AGE DISTRIBUTION:

The mean age in Group 1ranged 17-47 years was 33.51 years [± 8.052]. The mean age of patients in Group 2 ranged 15-50 years was 30.32 years [± 9.14]. Similarly, the mean age of patients in Group 3 ranged 15-50 was 28.54 [±8.7]. All the groups were matched for age with no significant difference between Groups 1, 2 and 3.

SEX DISTRIBUTION:

There were a total of 216 patients of which 128 were males (59.25%) and 88 were females (40.74%) [Male: Female= 1.45]. Group 1 consisted of 16 males (59.25%) and 11 females (40.74%) [Male: Female= 1.45]. Group 2 consisted of 25 females (43.10%) and 33 males (56.89%) [Male: Female= 1.32]. Group 3 consisted of 52 females (39.69%) and 79 males (60.34%) [Male: Female= 1.51].

BMI DISTRIBUTION:

The mean BMI of group 1 ranged 20-25.5 was 23.25 [±3.25]. The mean BMI of Group 2 ranged 19-25 was 23.04 [±4.75]. The mean BMI of Group 3 ranged 20-25 was24 [3.17]

There was no significant difference in the mean BMI of the three groups.

BIRTH ORDER:

The mean Birth order in Group 1 was 3.33[±2.0].Similarly, the mean birth order for Group 2 was 2.60 [±1.77] for Group 3 the mean was 3.16 [±2.04]. There was no significant difference between the groups 1, 2 and 3.

NUMBER OF SIBLINGS:

The mean of group 1 was 4.33 [±2.5], of group 2 the mean was 3.27 [±1.96], of group 3 the mean was 3.05 [±1.9]. There was no significant difference between groups 1, 2 and 3.

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REFERENCES

1. Shah A. Editorial - Rarely does one hear a wheeze without a sneeze. *Indian J Chest Dis Allied Sci* 2000; 42: 143-145.
2. Deepak D, Shah A. Allergic rhinitis: a neglected disease. *Indian J Allergy Appl Immunol* 2000; 14: 1-6.
3. Slavin RG. Asthma and sinusitis. *J Allergy Clin Immunol* 1992; 90: 534-537.
4. Bachert C, Vignola AM, Gevaert P, Leynaert B, van Cauwenberge P, Bousquet J. Allergic rhinitis, rhinosinusitis, and asthma: one airway disease. *Immunol Allergy Clin N Am* 2004; 24:19-43.
5. Slavin RG. Complications of allergic rhinitis: implications for sinusitis and asthma. *J Allergy Clin Immunol* 1998; 101: S357-S360.
6. Fox RW, Lockey RF. The impact of rhinosinusitis on asthma. *Curr Allergy Asthma Rep* 2003; 3: 513-518.
7. Report of the Rhinosinusitis Task Force Committee. *Otolaryngol Head Neck Surg* 1997; 117: S1- S68.
8. Rachelefsky GS, Katz RM, Siegel SC. Chronic sinus disease with associated reactive airway disease in children. *Pediatrics* 1984; 73: 526-529.
9. de Benedictis FM, Bush A. Rhinosinusitis and asthma – epiphenomenon or causal association? *Chest* 1999; 115: 550-556.
10. Bresciani M, Paradis L, des Roches A, Vernhet H, Vachier I, Godard P, et al. Rhinosinusitis in severe asthma. *J Allergy Clin Immunol* 2001; 107: 73-80.
11. ten Brinke A, Grootendorst DC, Schmidt JT, de Bruine FT, van Buchem MA, Sterk PJ, et al. Chronic sinusitis in severe asthma is related to sputum eosinophilia. *J Allergy Clin Immunol* 2002; 109:621-626.
12. Yousem DM. Imaging of sinonasal inflammatory disease. *Radiology* 1993; 188: 303-314.
13. National Heart Lung and Blood Institute. Global initiative for asthma: global strategy for asthma management and prevention: NHLBI/WHO workshop report.2002 National Heart Lung and Blood Institute. Bethesda, Maryland: Publication No.95-3659, 69-70.
14. Dykewicz MS, Fineman S. Diagnosis and management of rhinitis: Parameter documents of the Joint Task Force on practice parameters in Allergy, Asthma, and Immunology. *Ann Allergy Asthma Immunol* 1998; 81:463-518.
15. Bousquet J, van Cauwenberge PB, Khaltaev N, et al. Allergic rhinitis and its impact on asthma (ARIA

workshop report). *J Allergy Clin Immunol* 2001; 108: S147-S336.

16. Businco L, Fiore L, Fredianin T, Artuso A, di Fazio A, Bellioni P. Clinical and therapeutic aspects of sinusitis in children with bronchial asthma. *Int J Pediatr Otorhinolaryngol* 1981; 3: 287-294.
17. Berrettini S, Carabelli A, Sellari-Franceschini S, Bruschini L, Abruzzese, Quartieri F, et al.Perennial allergic rhinitis and chroni rhinosinusitis : correlation with rhinological risk factors. *Allergy* 1999; 54: 242-248.
18. Lund V, Kennedy D. Quantification for staging sinusitis. *Ann Otol Rhinol Laryngol* 1995; 167: 17-22.
19. Konen E, Faibel M, Kleinbaum Y, Wolf M, Lusky A, Hoffman C, et al. The value of the occipitomental (Waters') view in diagnosis of sinusitis: a comparative study with computed tomography. *Clin Radiol* 2000; 55: 856-860.
20. Bhattacharyya N, Fried MP. The accuracy of computed tomography in the diagnosis of chronic rhinosinusitis. *Laryngoscope* 2003; 113:125-129.
21. de Benedictis FM, Bush A. Rhinosinusitis and Asthma. Epiphenomenon and Causal Association? *Chest* 1999; 115:550-556.
22. Bhattacharyya N. Chronic rhinosinusitis: is the nose really involved? *Am J Rhinol* 2001; 15:169-173.
23. Meltzer EO, Hamilos DL, Hadley JA, Lanza DC, Marple BF, Nicklas RA, et al. Rhinosinusitis: establishing definitions for clinical research and patient care. *J Allergy Clin Immunol* 2004; 114: S155-S212.
24. Meltzer EO, Hamilos DL, Hadley JA, Lanza DC, Marple BF, Nicklas RA, et al. Rhinosinusitis: establishing definitions for clinical research and patient care. *Otolaryngol Head Neck Surg* 2004; 131: S1- S62.
25. Hamilos DL, Lanza DC, Kennedy D. Rhinosinusitis and the revised "Sinusitis practice parameters". *J Allergy Clin Immunol* 2005;116:1267-1268.