International Journal of Research in Medical Sciences
Singh RK. Int J Res Med Sci. 2019 Oct;7(10):3739-3743
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: http://dx.doi.org/10.18203/2320-6012.ijrms20194302

Original Research Article

Prevalence of asthma and association with the allergic rhinitis among the patients attending a tertiary care hospital of district Varanasi: a cross sectional study

Raj Kamal Singh*

Department of TB and Chest, MLB Medical College, Jhansi, Uttar Pradesh, India

Received: 17 July 2019
Accepted: 07 September 2019

***Correspondence:**
Dr. Raj Kamal Singh,
E-mail: drrajkamala2602@gmail.com

ABSTRACT

Background: The prevalence of Bronchial Asthma and Allergic Rhinitis is increasing not only in developing countries but also in developed as well. These two has been the subject of several epidemiological investigations and found an overlapping of symptoms between both diseases.
Methods: Present study conducted on the patients attending the OPD of Department of TB and chest, Institute of Medical Sciences, Banaras Hindu University, Varanasi and confirmed diagnosis of asthma and allergic rhinitis were made using spirometry and nasal-endoscopy respectively.
Results: 110 participants of age between 15 to more than 56 years were included attending the OPD of Department of TB and Chest with signs and symptoms related to the asthma. 32(29.09%) participants were age group of 15-25 years, 34(30.09%) of 26-35 years,18(16.36%) of 36-45 years and 15(14%) participants were from age group of 46-55years and rest 11(9%) were of 56years and above. common symptom was found nasal discharge 62(79.48%) participants followed by headache which was there in 59(75.64%) participants, excessive sneezing was found in 54(69.23%) participants and facial, postnasal discharge was found in 48(61.53%) of participants .Only 6(5.45%) participants had confirmed asthma. 6 asthmatic participants undergone the nasal endoscopy and out of 6(100%), 4(66.66%) had confirmed the diagnosis of allergic rhinitis but association was not found statistically significant.
Conclusions: The prevalence of bronchial asthma was higher among the younger age group Due to the overlapping of the symptoms between asthma and allergic rhinitis confirmatory diagnostic tools should be used before starting the treatment.

Keywords: Allergic rhinitis, Asthma, Spirometry

INTRODUCTION

Allergic respiratory conditions are a major public health challenge worldwide. According to the World Health Organization (WHO) estimates, about 300 million people around the world suffer from asthma and about 250,000 people die from the disease each year.[1] Likewise about 12% to 30% of the population across regions suffer from allergic rhinitis.[2] Although allergic rhinitis is not a fatal condition, it is associated with impaired quality of life, absenteeism from work and substantial financial costs.[3] Although over 80% of asthmatics have co-morbid allergic rhinitis (AR), the condition is frequently under-diagnosed in individuals with asthma.[4-6] Treatment of co-

morbid AR can reduce the odds of asthma-related healthcare, specifically emergency room visits and hospitalizations, by up to 80%.[7] Asthma is the most frequent chronic respiratory disease in childhood in many regions, including developing countries, and it is thus a serious public health problem with high morbidity and economic burden.[8] Asthma has several common characteristics with AR.[9] In addition, asthma is more common among AR patients, and it is a recognized risk factor for development of asthma in adults and in children.[10-13] Therefore, it has been suggested that both conditions would be different manifestations of a common pathogenic phenomenon of airways, representing a continuum of the same illness, although the mechanisms involved are not fully known. [14]

A recent multicentric study by the Asthma Epidemiology Study Group of the Indian Council of Medical Research found the prevalence of bronchial asthma in Indian adults to be 2.38%. They also ob-served that "recurrent coryza" occurred in 3.45%, "recurrent skin rashes" in 2.1%, and "recurrent eye itching" in 2.78% in Indian adults. Considering a population of 1.2 billion, these numbers suggest that the burden of rhinitis as well as asthma in India is immense. However, in India, AR still does not re-ceive the attention it deserves by both patients as well as clinicians15. Inflammation is an inert response of human body - is being understood better year by year and complexity of diseases related to inflammation. It is accepted and well understood that both allergic rhinitis (AR) and bronchial asthma (BA) are inflammatory disease. Inflammatory mechanisms are similar; in terms of infiltration by cells - eosinophils, T cells, and mast cells, release mediators and IgE - local and systemic. Hence "One airway - One disease" is acceptable in modern treatment options while managing both.[16] A few studies have conducted to establish the relation between asthma and allergic rhinitis so present study is conducted to find out the prevalence of asthma in the patients attending a teaching hospital and its association with allergic rhinitis.

METHODS

Present cross sectional study was conducted in department of TB & chest diseases and department of otorhinolaryngology in the Institute of Medical Sciences, Banaras Hindu University, Varanasi, UP from October 2003 to December 2005. After taking the prevalence of asthma 6.9% and 95% of confidence interval sample size came to 105 after applying the formula 4pq/L2. Then ethical approval from the Institute ethical committee had been taken and patients were explained about the study and those patients who gave their consent were included in this study. Patients between the age group of 15-50 years, who were previously diagnosed of asthma and currently diagnosed, nonsmokers were included in this study and patients less than 15 years of age and more than 50 years of age, smokers, patient with other lung diseases were excluded from the study. Questionnaire was developed and translated into vernacular language and again back translated to assure the validity. A structured questionnaire was prepared based on literature review, expert opinion, and group consensus. It included socio-demographic characteristics, details respiratory symptoms, details of active and passive smoking, and indoor air pollution. Detailed history including family history of asthma and allergy was taken attending the OPD of the department of TB & Chest and to make diagnosis confirmed pre and post bronchodilator spirometry was done and if the difference in FEV1was found more than 12% or 200ml then the patients were labeled as asthmatic and patients with asthma were evaluated for allergic rhinitis by taking history and diagnosis was confirmed by nasal endoscopy finding showing of nasal mucosa inflammation which were in concurrence to the history provided by the participants.. The data was collected and entered in Microsoft excel sheet and frequencies were calculated in percentage and Chi-square test was applied to find out the association of asthma and allergic rhinitis in Statistical package for social sciences(SPSS).

RESULTS

Present study was conducted in Institute of Medical Sciences, Banaras Hindu University Varanasi, UP. 110 participants of age between 15 to more than 56 years were included attending the OPD of Department of TB & Chest with signs and symptoms related to the asthma. As table 1 depicts that 32(29.09%) participants were age group of 15-25 years, 34(30.09%) of 26-35 years, 18(16.36%) of 36-45 years and 15(14%) participants were from age group of 46-55years and rest 11(9%) were of 56years and above, 67(60.9%) and 43(39.09%) participants was belonging to rural and urban area respectively.

Table 1: Socio demographic profile of the participants.

Socio-demographic		No (%)
Age groups	15-25	32 (29.09%)
	26-35	34(30.09%)
	36-45	18(16.36%)
	46-55	15(14.0%)
	56 and above	11(9.0%)
Sex	Female	55(50%)
	Male	55(50%)
Socioeconomic Status	Upper Middle Class	11(10%)
	Lower Middle Class	53(4818%)
	Lower Class	46(41.81%)
Living Area	Rural	67(60.90%)
	Urban	63(39.09%)

It also shows that majority of participants 53(48.18%) was from lower middle class followed by 46 (41.81%) of lower class of socioeconomic status,55 (50%) female and 55(50%) male were included in the study.

All the 6 asthmatic participants undergone the nasal endoscopy and out of 6(100%), 4(66.66%) had confirmed the diagnosis of allergic rhinitis (Figure 2). Association of asthma with allergic rhinitis was not found statistically significantly as p-value was found >0.05.

Table 2: Distribution of Signs/ Symptoms of lower respiratory tract involvement among the participants.

Signs/Symptoms of lower respiratory tract involvement	No.(%)
Productive cough	74(68.51%0
Sputum amount	
Scanty	58(53.70%)
Moderate	16(14.81%)
Copious	0(0%)
Nature of expectorant	
Mucoid	60(55.56%)
Mucopurulent	13(12.03%)
Purulent	1(0.9%)
Breathlessness	110(100%)
Chest Pain	23(21.29%)
Haemoptysis	0(0%)
Clubbing	0(0%)
Rhonchi	110(100%)
Crepts	90(81.82%)

Table 3: Breakdown of occurrence of different symptoms and signs related to nasosinal involvement.

Symptoms of naso-sinal involvement	No. (%)
Nasal discharge	62(79.48%)
Headache	59(75.64%)
Facial pain	48(61.53%)
Postnasal discharge	48(61.53%)
Nasal obstruction	38(48.71%)
Excessive sneezing	54 (69.23%)
Signs of naso-sinal involvement	
DNS	12(15.38%)
Nasal mucosal congestion	49(62.82%)
Postnasal drip	48(61.53%)

Table 2 depicts the symptoms and signs of lower respiratory tract involvement, all the participants were presented with the breathlessness followed by productive cough in 74(68.51%) of the participants out of 74 patients with productive cough was having scanty amount of sputum in 58 participants and 16 participants had moderate amount of sputum.110 participants out of 110 had rhonchi and 90(8.82%) had crepts on auscultation.

Table 3 tells about the nasosinal symptoms among the participants and most common symptom was found nasal discharge 62(79.48%) participants followed by headache which was there in 59(75.64%) participants, excessive sneezing was found in 54(69.23%) participants and facial, postnasal discharge was found in 48(61.53%) of participants. Nasal mucosa congestion and postnasal drip were found 49(62.82%) and 48(61.53%) respectively.

Table 4: Distribution of patients according to their initial diagnosis at the time of presentation.

Diseases	No. (%)
Bronchial Asthma	43(39%)
Allergic Rhinitis	67(61%)

Table 4 explains that at the time of presentation in OPD out of 110(100%), 50(45%) presented with the allergic rhinitis. Later on, the diagnosis of allergic rhinitis was confirmed in only 4 patients by nasal endoscopy. Out of 110 participants only 6(5.45%) had confirmed diagnosis of asthma by doing perimetry.

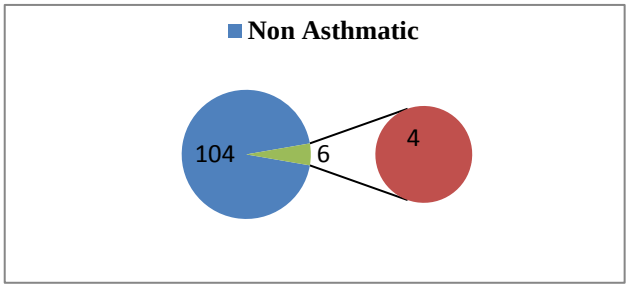

Figure 1: Distribution of nasosinal involvement among the participants.

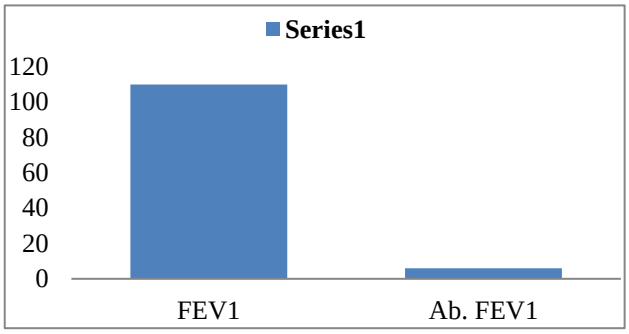

Figure 2: Distribution of deranged FEV1 among the participants.

Table 5: Association of asthma and allergic rhinitis.

Allergic rhinitis	Asthma		Total
	Present	Absent	
Present	4	106	110
Absent	2	108	110

Chi Square Value =0.68, p-Value>0.05

DISCUSSION

Asthma is recognized as a major health problem by WHO, there is still paucity of data on the prevalence of bronchial asthma among adolescents in India. The present study is hospital based study conducted on 110 patients

attending the OPD of the Department of TB & Chest, Institute of medical sciences, BHU, Varanasi. Majority of patients 34 (30.04%) were from age group of 26-35 years. As table 1 depicts that 32(29.09%) participants were age group of 15-25 years, 34(30.09%) of 26-35 years, 18(16.36%) of 36-45 years and 15(14%) participants were from age group of 46-55years and rest 11(9%) were of 56 years and above. A multicentric study was conducted by Jindal et-al and found that majority of patients having the symptoms like asthma was from the age group of 15-24 years followed by 25-34 years, 67(60.9%) and 43(39.09%) participants was belonging to rural and urban area respectively[17]. Jindal et al also found the majority of patients were from rural background.[17] It also shows that majority of participants 53(48.18%) was from lower middle class followed by 46(41.81%) of lower class of socioeconomic status, 55(50%) female and 55(50%) male were included in the study.

Table 2 depicts the symptoms and signs of lower respiratory tract involvement, all the participants were presented with the breathlessness followed by productive cough in 74(68.51%) of the participants out of 74 patients with productive cough was having scanty amount of sputum in 58 participants and 16 participants had moderate amount of sputum.110 participants out of 110 had rhonchi and 90(8.82%) had crepts on auscultation. Study conducted by Bhalla Kapil, Nehra Deepak found rhonchi in 89% of the participants whereas in present study it was all the participants had the rhonchi this is might be because of the rural background of participants.[18] Table 3 tells about the nasosinal symptoms among the participants and most common symptom was found nasal discharge 62(79.48%) participants followed by headache which was there in 59(75.64%) participants, excessive sneezing was found in 54(69.23%) participants and facial, postnasal discharge was found in 48(61.53%) of participants. Nasal mucosa congestion and postnasal drip were found 49(62.82%) and 48(61.53%) respectively. A study conducted by P. montenmery et al find the significant relation between the nasosinal symptoms and asthma.[19] Table 4 explains that at the time of presentation in OPD out of 110(100%), 50(45%) presented with the allergic rhinitis. Later on the diagnosis of allergic rhinitis was confirmed in only 4 patients by nasal endoscopy. Out of 110 participants only 6(5.45%) had confirmed diagnosis of asthma by doing perimetry. A study was carried out by Prakash Kumar in which he find out the prevalence of asthma is 4.19-5.49% similar finding has been found in the present study. All the 6 asthmatic participants undergone the nasal endoscopy and out of 6(100%), 4(66.66%) had confirmed the diagnosis of allergic rhinitis (Figure 2). Association of asthma with allergic rhinitis was not found statistically significantly as p-value was found >0.05. Study conducted by Benedicte Leynaert et al conducted a study and findings were found to be similar, they found 74% to 81% of subjects with asthma reported rhinitis, depending on sensitization to specific allergens.[20] Conversely, the risk of asthma increased from 2.0% in subjects without rhinitis to 6.7% in subjects with rhinitis only when exposed to pollen, 11.9% in subjects with rhinitis when exposed to animals, and 18.8% in subjects with rhinitis either when exposed to pollen or to animals. The association between rhinitis and asthma remained significant after adjustment for total IgE, parental history of asthma, and allergen sensitization (OR, 3.41; 95% CI, 2.75-4.21), suggesting that the coexistence of asthma and rhinitis is not solely due to atopic predisposition to these diseases.

CONCLUSION

There were few overlapping among the symptoms of between asthma and rhinitis due to variation in sensitization to individually, the strong association between asthma and rhinitis was not fully explained.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. World Health Organisation. Asthma. Fact sheet no.307, 2011. Available at: http://www.who.int/mediacentre/factsheets/fs307/en/index.html.
2. Zhang Y, Zhang L. Prevalence of allergic rhinitis in china. Allergy, Asthma Immunol research. 2014 Mar 1;6(2):105-13.
3. Schoenwetter WF, Dupclay L Jr., Appajosyula S, Botteman MF, Pashos CL. Economic impact and quality-of-life burden of allergic rhinitis. Curr Med Res Opin. 2004;20(3):305-17.
4. Bousquet J, Khaltaev N, Cruz AA, Denburg J, Fokkens WJ, Togias A, et al.Allergic Rhinitis and its Impact on Asthma (ARIA) 2008 update (incollaboration with the World Health Organization, GA(2)LEN and AllerGen). Allergy. 2008;63 Suppl 86:8-160.
5. Bunyavanich S, Soto-Quiros ME, Avila L, Laskey D, Senter JM, Celedon JC. Risk factors for allergic rhinitis in Costa Rican children with asthma. Allergy. 2010;65(2):256-63.
6. Jacobs TS, Forno E, Brehm JM, Acosta-Perez E, Han YY, Blatter J, et al. Underdiagnosis of allergic rhinitis in underserved children. J Allergy Clin Immunol. 2014;134(3):737-9
7. Corren J, Manning BE, Thompson SF, Hennessy S, Strom BL. Rhinitis therapy and the prevention of hospital care for asthma: a case–control study. J Allergy Clin Immunol. 2004;113(3):415-9.
8. Bousquet J, Bousquet PJ. Godard P, Daures JP, "The public health implications of asthma," Bulletin of the WHO. 2005;83(7);548-54.
9. Cruz AA, Popov T, Pawankar R, Annesi-Maesano I, Fokkens W, Kemp J, et al. ARIA Initiative Scientific Committee. Common characteristics of upper and lower airways in rhinitis and asthma:

ARIA update, in collaboration with GA2LEN. Allergy. 2007 Nov;62:1-41.
10. Leynaert B, Neukirch C, Kony S, Guénégou A, Bousquet J, Aubier M, et al. European Community Respiratory Health Survey. Association between asthma and rhinitis according to atopic sensitization in a population-based study. J Allergy and Clin Immunol. 2004 Jan 1;113(1):86-93.
11. Brożek JL, Bousquet J, Baena-Cagnani CE, Bonini S, Canonica GW, Casale TB, et al. Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines: 2010 revision. J Aller Clin Immunol. 2010 Sep 1;126(3):466-76.
12. Shaaban R, Zureik M, Soussan D, Neukirch C, Heinrich J, Sunyer J, et al. Rhinitis and onset of asthma: a longitudinal population-based study. The Lancet. 2008 Sep 20;372(9643):1049-57.
13. Van Den Nieuwenhof L, Schermer T, Bosch Y, Bousquet J, Heijdra Y, Bor H, et al. Is physician-diagnosed allergic rhinitis a risk factor for the development of asthma? Allergy. 2010 Aug;65(8):1049-55.
14. Caimmi D, Marseglia A, Pieri G, Benzo S, Bosa L, Caimmi S. Nose and lungs: one way, one disease. Italian J pediatr. 2012 Dec;38(1):60.
15. Aggarwal AN, Chaudhry K, Chhabra SK, D Souza GA, Gupta D, Jindal SK, et al. Prevalence and risk factors for bronchial asthma in Indian adults: a multicentre study. Indian Journal of Chest Diseases and Allied Sciences. 2006 Jan 18;48(1):13.
16. Mehta Parthiv, supplement to Journal of the association of physicians of india. March 2014;62;23-6.
17. Jindal SK, Aggarwal AN, Gupta D, Agarwal R, Kumar R, Kaur T, et al. Indian study on epidemiology of asthma, respiratory symptoms and chronic bronchitis in adults (INSEARCH). The Int J Tuberculosis and Lung Disease. 2012 Sep 1;16(9):1270-7.
18. Bhalla K, Nehra D, Nanda S, Verma R, Gupta R, Mehra S, et al. J Fam Med Pri Care, November-December 2018;7(6).
19. Montnemery P, Svensson C, Ädelroth E, Löfdahl CG, Andersson M, Greiff L, et al. Prevalence of nasal symptoms and their relation to self-reported asthma and chronic bronchitis/emphysema. Eur Res J. 2001 Apr 1;17(4):596-603.
20. Leynaert B, Neukirch C, Kony S, Guénégou A, Bousquet J, Aubier M, et al. European Community Respiratory Health Survey. Association between asthma and rhinitis according to atopic sensitization in a population-based study. J All Cli Imm. 2004 Jan 1;113(1):86-93.

Cite this article as: Singh RK. Prevalence of asthma and association with the allergic rhinitis among the patients attending a tertiary care hospital of district Varanasi: A Cross sectional study. Int J Res Med Sci 2019;7:3739-43.