

The Prevalence of Allergic Rhinitis in Asthmatics and the Impact on Bronchial Asthma Control: A Single Center Experience

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ABSTRACT

Objectives

The objective is to investigate the prevalence of allergic rhinitis as a cause of bronchial asthma among patients visiting the Royal hospital, (a tertiary care center, Muscat, Oman). In addition, the impact of allergic rhinitis in bronchial asthma patient management and control will be investigated.

Method

A retrospective study looked for patients diagnosed with bronchial asthma based on the Global Initiative for Asthma (GINA) criteria. In addition, to look at bronchial asthma with coexisting allergic rhinitis. Allergic rhinitis diagnosis with nasal symptoms and on active allergic rhinitis medication.

All patients were selected from the Royal Hospital from January 2014 to December 2018.

The impact of allergic rhinitis on bronchial asthma patient management, severity, and control was looked at by forced vital capacity in the first second (FEV1), management steps according to GINA guidelines, and asthma attacks per year i.e. emergency visits and prednisolone usage.

Results

A total of 569 patients fulfilled the inclusion criteria. The prevalence of allergic rhinitis in bronchial asthma patients in our institution (Royal Hospital) was estimated at 58.7%. Females (61.1%) were more affected with bronchial asthma and concomitant allergic rhinitis. Bronchial asthma with allergic rhinitis had higher management steps as per GINA guidelines than bronchial asthma alone, 10% and 5.6%, respectively, with a p-value of 0.034. However, there was no significant difference between the 2 groups, those with bronchial asthma with allergic rhinitis and those with bronchial asthma alone, in lung function as measured by FEV1 or frequency of asthma exacerbation.

Conclusion

Patients with bronchial asthma and allergic rhinitis had higher management steps as per GINA guidelines than with bronchial asthma alone.

Keywords: Bronchial asthma, allergic rhinitis, global initiative for asthma (GINA)

BACKGROUND

Bronchial asthma (BA) is a chronic inflammatory airway disease causing serious health and economic burdens, which affects the entire globe.

The prevalence of allergic rhinitis varies across countries ranging from 0.8% to 14.9% in the

children and from 1.4% to 39.7% in adolescents.¹ The SNAPSHOT program suggested that the prevalence of asthma ranged from 4.4% in Turkey to 6.7% in Egypt and 7.6% in the Gulf countries, including Kuwait, Saudi Arabia, and the United Arab Emirates.² A study conducted in Oman revealed that the prevalence of bronchial asthma is estimated to be 7.3% of

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adults and 12.7% of children. The cost of asthma treatment was estimated to be over OMR 61,500,294 per year (USD 159,900,761).³ The prevalence of allergic rhinitis in the Omani adult population was found to be 7%.⁴

Bronchial asthma and allergic rhinitis highly overlap, for example, 94% of people with allergic bronchial asthma have coexisting allergic rhinitis in Canada.⁵

Allergy rhinitis has many impacts on bronchial asthma patients and health services. It increases the economic burden, increases consumption of health resources, changes the therapeutic decision-making, and increases the severity of morbidity. In addition, the yearly medical costs were significantly higher for bronchial asthma patients with coexisting allergic rhinitis compared with those with only bronchial asthma.⁶

The previous studies in Oman investigated the prevalence of bronchial asthma and allergic rhinitis separately, and another investigation looked for asthma management control and costs.^{3,4}

Our study aims to estimate the prevalence of allergic rhinitis in bronchial asthma patients with its effect on asthma management in one tertiary care hospital.

METHOD

A retrospective study was conducted at the Royal Hospital, Muscat, Sultanate of Oman. The data were collected from patient records using the Al-Shifa 3+ system from January 2014 to December 2018.

Study design: We looked at the medical records of patients who were follow up at the Royal Hospital. Patients included in this study were 13 years old and above. Patients were diagnosed to have bronchial asthma using the Global Initiative for Asthma (GINA) guidelines, and then looked at for concomitant with allergic rhinitis. The diagnosis of allergic rhinitis was confirmed if patients had documented symptoms of rhinorrhea, nasal obstruction, nasal itchiness or sneezing, and if the patients were on active treatment (e.g., oral antihistamine and nasal steroid) for at least 12 months.

This study aimed to look at the prevalence of allergic rhinitis in BA patients and the contribution of allergic rhinitis in BA management and control. Those with other respiratory and cardiac diseases such as chronic obstructive pulmonary disease (COPD), decompensated heart failure, and interstitial lung disease were excluded from the study.

Demographic data were collected from patients' clinical records. A total of 3124 patient records were reviewed out of which 569 fulfilled the criteria.

The severity of asthma was looked at by forced vital capacity in the first second (FEV1), management steps, according to GINA guidelines, and asthma attacks per year. Asthma exacerbation was identified by frequency of emergency visits or the use of systemic corticosteroids as per the advice of a clinician.

Data was initially collected on a data collection sheet contained demographic then transferred to EpiData software. Data were analysed using the statistical package for social sciences SPSS 20 software. Descriptive statistics were used for mean and standard deviations and frequency distribution was used for count and percentages. Results were considered significant when pvalue was less than 0.05.

RESULTS

A total of 569 patients were diagnosed to have bronchial asthma and were treated according to GINA guidelines. A total of 162 (28.5%) were males, whereas 407 (71.5%) were females. The mean age was 48 years, and the standard deviation was 16 ± 17 .

The overall prevalence of documented allergic rhinitis in this study was 58.9% (335). Out of 569 patients, a total of 234 (41.1%) had bronchial asthma alone.

Females were more affected with bronchial asthma concomitant allergic rhinitis (61.6%), which was statistically significant with a p-value of 0.029 (see Figure 1). Younger patients are more at risk to develop allergic rhinitis with bronchial asthma than bronchial asthma alone, 45.09 +/- 15 years vs 52 +/- 18 years, respectively, with a p-value of 0.0001(seeTable 1).

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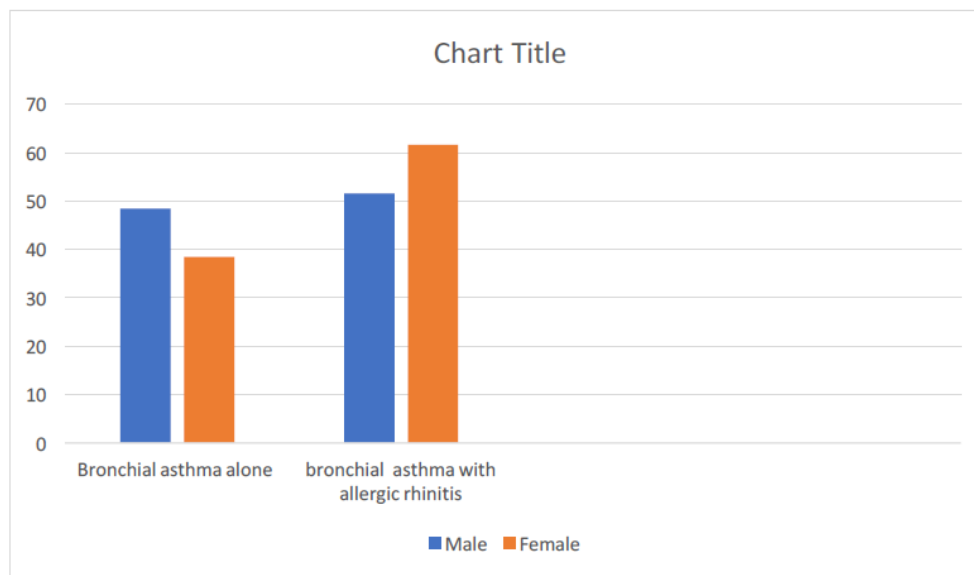


Figure 1: Distribution of gender in bronchial asthma alone vs concomitant with allergic rhinitis

Table 1: Demographic characteristics of the patients

	Bronchial asthma alone	Bronchial asthma with allergic rhinitis
Gender:	78/234 (48.4%)	83/333 (51.6%)
Male	156/234 (38.4%)	250/333 (61.6%)
Female		p-value 0.029
Age	Mean: 52 +/- 18 years	Mean: 45.09 +/- 15 years
		p-value 0.0001
Management steps:	38 (16.3%)	35 (12.9%)
Mild	182 (78.1%)	265 (79.5%)
Moderate	13 (5.6%)	33 (10%)
Severe		p-value: 0.034
FEV1:	5 (4.1%)	19 (10.1%)
Normal	36 (29.5%)	60 (31.7%)
Mild	71 (58.2%)	99 (52.4%)
Moderate	10 (8.2%)	11 (5.8%)
Severe	Mean(SD) 72.9% +/- 16.1	Mean(SD) 76.7% +/- 18.2
		p-value: 0.072
Emergency department visit:	0.36	0.35 p-value: 0.6
Prednisolone	0.41	0.36 p-value: 0.5

The patients that had bronchial asthma along with allergic rhinitis had more severe symptoms and required higher dose of medication as per GINA management steps in comparison with patients with bronchial asthma alone, 10% and 5.6%, respectively, with a p-value of 0.034 (see Table 1).

The lung function test, as assessed by FEV1, found no significant difference in FEV1 76.7% +/- 18.2 and 72.9% +/- 16.1 in patients with bronchial asthma and allergic rhinitis, respectively.

Similarly, the number of emergency department visits was insignificant in both groups with a p-value of 0.6. There was also no significant difference in the use of systemic corticosteroid, as it was 0.41 in patients with BA alone and

0.36 in patients with BA with concomitant allergic rhinitis, with a p-value 0.5.

DISCUSSION

The pathophysiology of bronchial asthma and allergic rhinitis is the same. Similarly, there is a link between the upper and lower airway. Allergic rhinitis usually precedes bronchial asthma symptoms and asthma diagnosis, so there is strong link between bronchial asthma and allergic rhinitis.⁷

In this study, the estimated prevalence among Royal Hospital patients developing bronchial asthma with allergic rhinitis is 57.8%. Females (61.1%) were significantly more affected than males (38.9%). Of note is the fact that the worldwide prevalence of BA concomitant AR ranges between 50 to 94%.^{5,8}

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The Allergic Rhinitis and its Impact on Asthma (ARIA) program examined the impact of allergic rhinitis on asthma. The ARIA study links allergic rhinitis to bronchial asthma. Bronchial asthma morbidity has a substantial economic burden. The leading cause of the increased cost of this illness is from emergency care visits and hospitalisation. Furthermore, it affects lifestyle through the loss of school days for children, less family activity, and a loss of work which causes an economic burden.⁶

Our study showed that patients with BA and AR need higher steps in the management process of BA when compared with BA alone.

AR has a strong association in the pathogenesis of asthma. It is believed that the management of AR is likely to result in the improvement of asthmatic symptoms.⁹ Studies have shown that patients with concomitant allergic rhinitis who were treated for AR with any type of medication had decreased frequency of exacerbation of asthma (i.e., fewer emergency visits and/or hospitalisations) than those who were not on any treatment. Treatment of allergic rhinitis using intranasal steroids and antihistamines has been shown to be effective in the protection against exacerbations of asthma, which led to fewer emergency visits for asthma and improved asthma symptoms, it lessened the need for a rescue inhaler, and improved lung function.^{10,11,12}

Bronchial exacerbation occurred more often for the untreated AR group than the treated group, 6.6% compared with 1.3%, respectively.¹³

In our study, there was no significant difference in lung function tests, emergency visits, or the use of systemic steroids between BA concomitant AR patients and BA patients alone. This could be explained by the fact that our patients were already on treatment for AR, hence the improvement of their BA symptoms.

CONCLUSION

High prevalence of allergic rhinitis in asthmatic patients results in higher medication steps in asthma patients with allergic rhinitis. More attention is needed to manage allergic rhinitis due to the fact that it improves lung function, asthma symptoms, and decreases the number of emergency visits and hospitalisations.

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