Original Article

Medicine Section

The Prevalence of the Gastro Oesophageal Reflux Disease in Asthmatics

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ABSTRACT

Background: Asthma and Gastro Oesophageal Reflux Disease (GERD) often coexist. The prevalence of GERD is estimated to be around 30-80% among asthmatics. GERD may worsen during an episode of airway obstruction and could also serve as a trigger for such an attack. The proposed mechanisms of GERD induced asthma include a vagally mediated reflex, micro aspiration and altered immune activity. As only limited information is available regarding its prevalence in asthmatics in developing countries such as India, this study was undertaken.

Aim of the Study: To estimate the prevalence of GERD in adult asthmatics

Settings and Design: This cross sectional study was conducted among asthmatics who were recruited from a tertiary centre in Chennai.

Methods and Material: This study was conducted among 86 asthmatics which included both males and females in the age group of 20-65 years. Known asthmatics who were diagnosed to be asthmatics at least a year ago, were included in the study. Smokers, subjects with a history of chronic obstructive pulmonary disease, tuberculosis, gastro intestinal malignancies and pregnant women were excluded from the study. A structured questionnaire was administered and GERD was determined if they had the typical clinical symptoms such as postprandial chest pain, heart burn, nausea and sour regurgitation.

Statistical Analysis Used: The data was analyzed by using the SPSS software. The prevalence rate was expressed in terms of percentage.

Results: The overall prevalence of GERD in asthmatics was 51.1%. The prevalence of GERD was higher in female asthmatics as compared to that in men. (56% vs 46%) The prevalence of GERD was higher in younger individuals as compared to that in the elderly.

Conclusion: This study has quantified the prevalence of GERD in individuals with asthma, and it has contributed to our understanding about the association between these two diseases. This study can be used to estimate the burden of GERD among asthmatics. Whether it is asthma that precedes GERD or whether it is GERD that precedes asthma has to be explored. This study stresses the need for patients with asthma to be evaluated for gastroesophageal reflux and to be treated with aggressive anti-reflux therapy to reduce the morbidity.

Key Words: Gastro oesophageal reflux disease, Asthma, Spirometry

KEY MESSAGE

- Higher prevalence of GERD in asthmatics
- Asthma considered as a risk factor for GERD
- Proper management of asthma would reduce the incidence of GERD

INTRODUCTION

Gastro-oesophageal reflux and asthma, both of which are common conditions often coexist and the association between the two has long been recognized, both mechanistically and epidemiologically [1]. The global prevalence of GERD was reported to be around 30-80% among asthmatics [2] and it has been suggested that GERD may be a predisposing factor for the asthmatic episodes [3,4]. Both animal and clinical data suggest that gastro-oesophageal reflux serves as a trigger of bronchospasm and that it potentiates the bronchomotor response to additional triggers or both. GERD may worsen during an episode of airways obstruction and could also serve as a trigger for such an attack. The clinical relevance of this interplay continues to be explored, with special interest being given to the role of GERD in the worsening of asthma. Although several studies have been conducted to estimate the prevalence of GERD and asthma independently in the general population, only limited information is available regarding the prevalence of GERD in asthmatics. Despite the enormous volume of literature that exists on this subject, there is a shortage of data in a developing country such as India. Hence, this study was conducted in Chennai to estimate the prevalence of GERD in asthmatics, which in turn may pave way to calculate the burden of this disease in asthmatic individuals. This study may not only serve as a platform to elucidate the pathophysiological relationships between asthma and GERD, but it may also help in exploring the links between the treatment of GERD and asthma.

MATERIALS AND METHODS

This cross sectional study was conducted among 86 asthmatics which included both males and females in the age group of 20-65 years. All the study subjects were recruited from the outpatient department of a tertiary centre in Chennai. The diagnosis of asthma was established both clinically (characteristic history of variable wheezing, cough and breathlessness) and by spirometry (evidence of reversibility on spirometry with > than 15% of FEV1 after salbutamol inhalation). Known asthmatics who were diagnosed to be asthmatics at least a year ago, were included in the study. Smokers, subjects with a history of chronic obstructive pulmonary disease, tuberculosis and gastro intestinal malignancies and pregnant women were excluded from the study.

The study participants gave their consent prior to the study. A structured questionnaire for evaluating GERD was administered to the study participants. The presence of GERD was determined in accordance with the standards which are given below: typical clinical symptoms of GERD such as postprandial chest pain, heart burn, nausea and sour regurgitation.

STATISTICAL ANALYSIS

The data was analyzed by using the SPSS software and the statistical significance was estimated. The prevalence rate was expressed in terms of percentage. The Chi square test was used to estimate the statistical significance. P values which were less than 0.05 were considered as significant.

RESULTS

This cross sectional study was conducted among asthmatics and the descriptive characteristics of the study subjects are provided in [Table/Fig-1]. Most of the study subjects were under 45 years of age with a third above 45 years. Overall, 51.1% of the study participants (of the 86 subjects) were diagnosed to have GERD.

[Table/Fig-2] provides the prevalence rates of GERD among several subcategories within the study subjects. Although the difference in the prevalence of GERD across the subcategories was not statistically significant, we have described the differential prevalence across the select subcategories to illustrate the potential contributions from other risk factors. The prevalence of GERD was higher in women asthmatics (55.8%) as compared to that in asthmatic men (43%). The prevalence of GERD was higher in younger individuals from the age group 20-44 yrs (57.1% vs 43.3%) as compared to that in the elderly (45-60 yrs). Individuals who had asthma for more than 5 yrs had a higher prevalence of GERD as compared to the asthmatics with a history of shorter duration (59% vs 43%), although the difference was not statistically significant.

Study Variables		n	Prevalence of GERD (%)
Gender	Male	43	46.5%
	Female	43	55.8%
Age	20-44yrs	56	57.1%
	45-60yrs	30	43.3%
Duration of Asthma	1-5 yrs	42	42.8%
	>5 yrs	44	59.1%
BMI	BMI>30	60	56.6%
	BMI≤30	26	38.4%

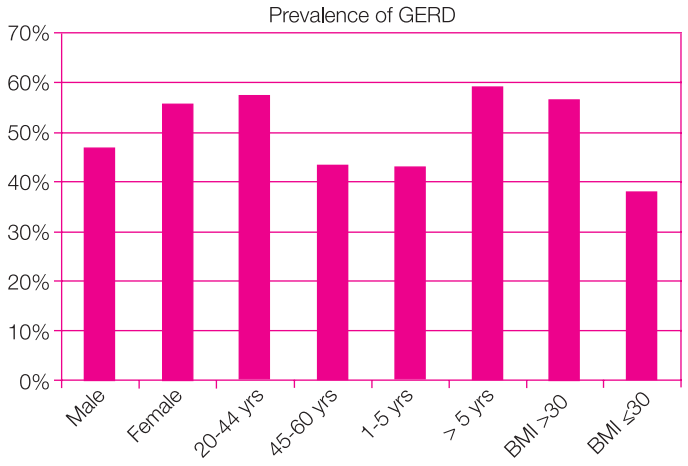
[Table/Fig-1]: Descriptive characteristics of the study subjects

DISCUSSION

This epidemiological study was carried out for estimating the prevalence of GERD, as there have been only few prevalence assessments for GERD in our geographical location, especially among asthmatics. A majority of the studies have been conducted in the general population. Although the studies vary in their criteria for diagnosing as to what level of symptoms were pathological, the symptoms of GERD appear to be more common among the asthma populations as compared to a 35 to 40% incidence which was reported for the general population. The clinical features were almost the same between normal GERD and asthma induced GERD, except for the fact that the asthmatics had GERD symptoms following episodes of asthma and after taking anti asthmatic medication.

The overall prevalence of GERD was found to be 51.1% among the study subjects. The altered respiratory physiology in the asthma patients may predispose them towards GERD. Such a higher prevalence of GERD in asthmatics could be attributed to the following reasons. Respiratory obstruction can result in negative pleural pressures, thus increasing the pressure gradient between the thorax and the abdominal cavity and facilitating the movement of gastric secretions towards the lower oesophageal sphincter (LES), thus promoting reflux [5]. Moreover, the diaphragm's contribution to the sphincter tone is decreased in asthma. Furthermore, bronchodilator therapies (both beta-agonists and theophylline) appear to reduce the LES pressure and increase the pressure gradient across the LES, thereby promoting the development of GERD [6, 7]. The GERD in asthma can be summarized as a reflux which leads to micro-aspiration, which occurs in persons with a heightened bronchial reactivity and an immune system modification [8]. Obesity both in men and women can also predispose to GERD [9]. The mechanisms which underlie the association between obesity and GERD are only partly understood. Obesity-related changes in the gastro-oesophageal anatomy and physiology such as an increased prevalence of oesophageal motor disorders, a diminished lower oesophageal sphincter pressure, the development of hiatal hernia and increased intra gastric pressure might contribute to an explanation for this association. In women, oestrogen might also be involved in this association. The prevalence of GERD was found to be higher (57%) in asthmatics with a BMI which was > 30 as compared to that in asthmatics with a lower BMI (38%). But the difference was not statistically significant.(P value- 0.13).

There was no statistically significant difference in the prevalence of GERD between women and men. Similar results were obtained



[Table/Fig-2]: Prevalence of GRED

by Dennis and Wang [10,11] who stated that there was no specific gender difference in the prevalence of GERD. There was no statistically significant difference in the prevalence of GERD between young adults (20-45) yrs and older adults (45-60). The prevalence of GERD was more in asthmatics who had a longer duration of the disease, though it was not statistically significant, thus suggesting the interplay of asthma and GERD. This could be because of the frequent exacerbations of asthma and anti asthma medication use, which may have decreased the LES pressure.

RELEVANCE

As this was a cross sectional study which was aimed at estimating the baseline prevalence, the available evidence does not yet clearly indicate whether GERD precedes asthma or whether asthma triggers GERD. The recently published Montreal definition of GERD concludes that GERD can be an "aggravating cofactor" in asthma [12]. Future research will further define the association between asthma and gastro oesophageal reflux.

LIMITATIONS OF THE STUDY

More sophisticated methods including barium oesophagogram, endoscopic examination, mucosal biopsy and the measurement of the LES pressure could not be done in this study due to logistic reasons.

CONCLUSION

This cross sectional study has quantified the prevalence of GERD in individuals with asthma and this baseline prevalence may serve as a platform to estimate the burden of the disease in vulnerable populations such as asthmatics. The higher prevalence of GERD in asthmatics highlights the existence of certain pathophysiological relationships between asthma and GERD, which have to be evaluated and explored in order to understand the association between these two diseases and to recognize the links between the treatment of GERD and asthma. Moreover, this stresses the need for patients with asthma to be evaluated for gastro-oesophageal reflux to be treated with aggressive anti reflux therapy and if required, to be subjected to anti reflux surgery in order to reduce the respiratory morbidity.

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