Original Article

# Frequency of Gastroesophageal Reflux Disease in Patients with Asthma

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**Objective:** To analyze the frequency of Gastroesophageal reflux disease in patients with asthma in our population.

**Methods:** A cross sectional study that was conducted through medical out-patient Department services hospital Lahore.100 asthmatic patients, among those 59 females and 41 males were screened for GERD in outpatient department. Patients were selected between age 20 and 70 years. The study was completed in six months. The calculated sample size was 100 cases, with 10% margin of error, 95% confidence level, taking expected percentage of GERD 36% in patients with asthma. Data was collected and compiled in the computer and analyzed using SPSS version 11 for Windows. Quantitative variables included age and expressed as mean±standard deviation.

**Results:** Out of 100 patients with asthma, 33% were found to have symptoms of GERD. Female patients were 59% and 34% suffered from GERD. In males, out of 41% asthmatics, 19% suffered from GERD.

**Conclusions:** Therefore we can conclude there is a high frequency of GERD in patients with asthma in our population. So, it is recommended that all asthmatic patients should be screened out for symptoms of GERD.

**Keywords:** asthma, gastroesophageal reflux disease, GERD, reflux.

## Introduction

Asthma is one of the commonest chronic diseases worldwide, affecting over 300 million population. The prevalence of asthma has increased steadily in the latter half of the last century and the early years of this century too. A genetic predisposition to asthma is recognized. Prevalence, hospitalizations, and fatal asthma have all increased worldwide over the past 20 years. The socio economic impact of asthma is enormous, particularly when poor control leads to absence from school or work, hospitalization and for some patients a premature death. One of the proposed risk factors for Asthma exacerbations is gastroesophageal reflux disease (GERD). Gastroesophageal reflux disease is one of the most commonly diagnosed diseases seen in outpatient clinics with the estimated prevalence of 14-20% in the adult general population.

Gastroesophageal reflux disease (GERD) is defined as a condition which occurs when the reflux of stomach contents cause troublesome symptoms.[1] It is a common disorder worldwide.[2] It usually runs a chronic course.[3] History is the quickest and simplest method to diagnose GERD. An objective evaluation to assess the severity and the response to treatment can be obtained by Frequency scale for the symptoms of GERD (FSSG) questionnaires.[4] Twenty four hour pH monitoring can also by employed but it is not widely available.[5] Prevalence of upper respiratory symptoms is high in patients with GERD, [6]and is a potential trigger of asthma, chronic obstructive pulmonary disease (COPD).[7]

GERD is one of the co-morbidities of Asthma. Asthma exacerbations are associated with frequent hospital admissions progressive deterioration of lung function and a poor quality of life. Asthma exacerbations have a very close association with the presence of GERD. It causes repeated asthma exacerbations and thus a progressive decline in lung function. By giving asthmatic patients anti reflux therapy, repeated exacerbations can be prevented. Different populations have different prevalence of GERD in asthmatics and no such data is available from our population. An estimate of this association in Pakistani population will help establish guidelines for improvement in quality of life of such asthmatic patients.

## Methods

Study was conducted through medical outpatient department, Services Hospital, Lahore. The study was completed in six months from 22nd December 2012 till 22nd June 2013. It was a cross sectional study. The calculated sample size was 100 cases, with 10 % confidence level, taking expected percentage of

Probability sampling technique was used. All the patients having asthma, both genders. Age between 20 to 70 years. All patients with history of medication intake for GERD were excluded.

Subjects were selected from medical outpatient Department, Services Hospital Lahore. The FSSG questionnaire was filled by all the patients. FSSG consists of 12 questions, which were scored to indicate the frequency of symptoms as follows: never=0; occasionally=1; sometimes=2; often=3; and always=4. Patients with FSSG scores of more than 8 were considered as suffering from GERD. All ethical issues were addressed by counseling patients and taking informed consent. Information was collected through a Performa attached as annexure

Data was collected and compiled in the computer and analyzed using SPSS version 11 for Windows. Quantitative variables included age and expressed as mean + standard deviation. Gender and presence or absence of GERD were qualitative variables and expressed as frequencies and percentages. Data was used to calculate frequency of GERD in asthmatic patients.

## Results

A total of 100 patients with asthma were selected according to inclusion and exclusion criteria from out-patient department, Services Hospital Lahore. **Fig-1** shows bar chart of the frequency of GERD in patients with asthma. It showed that GERD frequency was 33% in patients with asthma, while 67% asthmatics did not complain of reflux symptoms. Cross Tabulation between GERD and predefined age groups **(Table-1)** revealed maximum number of cases were 14 in patients 31-40 years old, followed by 11 cases in 41-50 years old, 5 cases in 51-60 years old, 2 cases in 20-30 years old and only 1 case of GERD in 61-70 years old patients. **Fig-2** shows histogram of age for asthma patients. Patients were distributed normally according to age. Mean Age of study population was 41.79 years ± SD of 9.872. **Fig-3** represents the gender distribution among study population. 41% of total asthmatics were male, while 59% were females. **Fig-4** shows Stratification of gender in asthmatic patients with GERD. It showed that for females, out of 59% asthmatics, GERD was present in 34%. While for males, out of 41% asthmatics, 19% suffered from GERD. **Fig-5** segregates the GERD confirmed individuals according to age groups and gender. Mostly GERD confirmed individuals had similar sex distribution

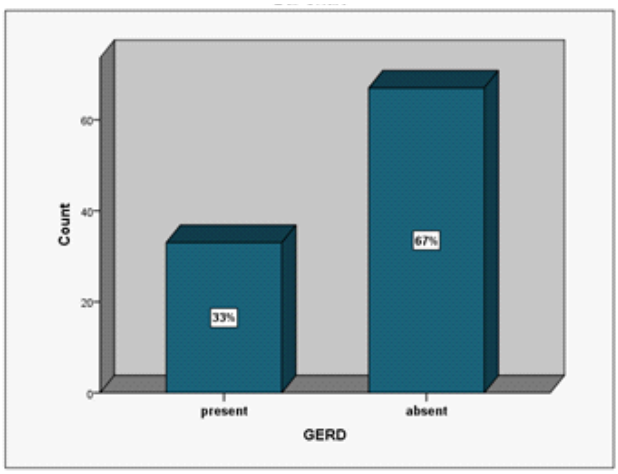


**Fig-1:** Frequency of GERD in asthmatics.

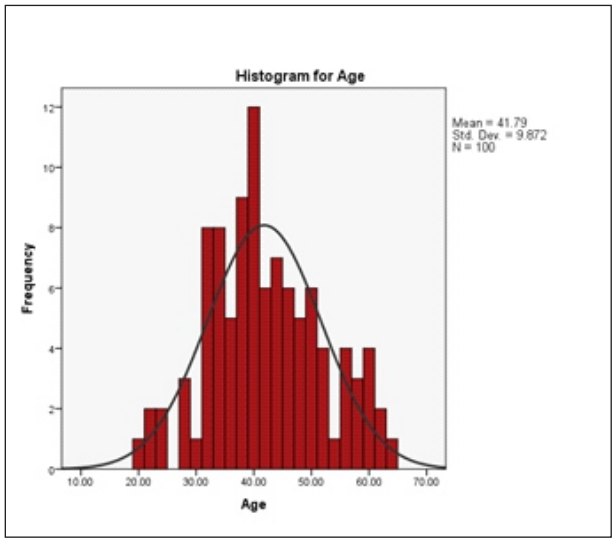


**Fig-2:** Age distribution in asthma patients.

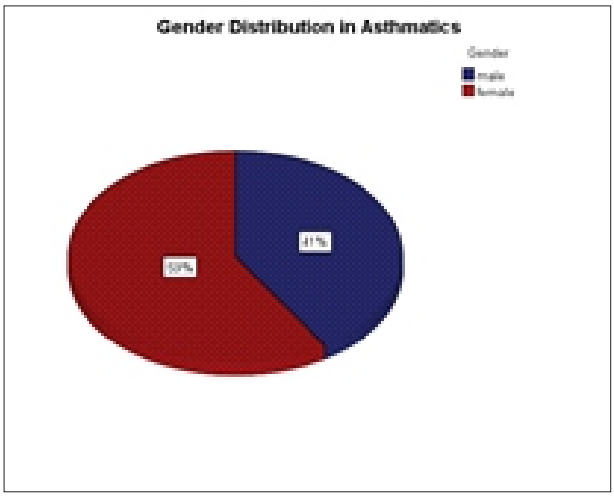


**Fig-3:** Gender distribution in asthma patients.

**Table-1:** Cross tabulation between GERD and predefined age groups.

| | | Age | | | | | |
|---|---|---|---|---|---|---|---|
| | | 20-30 | 31-40 | 41-50 | 51-60 | 61-70 | Total |
| GERD | Present | 02 | 14 | 11 | 05 | 01 | 33 |
| | Absent | 07 | 28 | 19 | 11 | 02 | 67 |
| Total | | 09 | 42 | 30 | 16 | 03 | 100 |

*GERD * Age Crosstabulation*

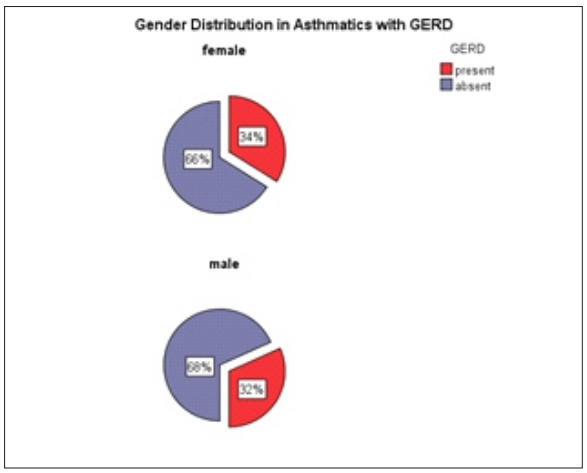


**Fig-4:** Gender distribution in Asthmatics with GERD.

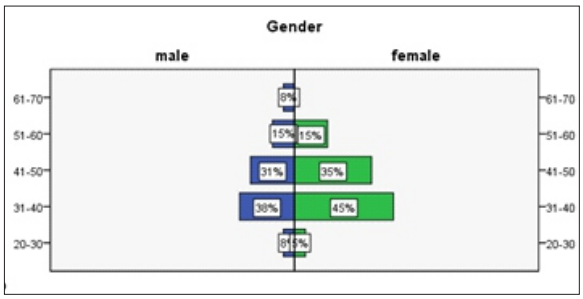


**Fig- 5:** Gender and age stratification in GERD confirmed Asthmatics.

## Discussion

A total Asthma is recognized as a major public health problem by WHO. The prevalence and associated mortality rate is increasing worldwide. Asthmatics presenting in outdoor and emergency departments constitute a major bulk of total patients. The burden is increasing with high resource utilization due to frequent outdoor visits, acute exacerbations, repeated hospitalizations and chronic therapy. The causes of asthma are multiple environmental triggers combined with genetic predisposition. One of the important proposed risk factor is gastroesophageal reflux disease (GERD).GERD and its manifestations are extremely common in outdoor department. Although it is considered to be less common in underdeveloped countries,[8,9] but many population-based studies confirm that the prevalence of GERD is increasing in Asia. A causal relationship between asthma and GERD has been known and researched upon for some time now. GERD is considered to be the third leading cause of chronic cough and affects an estimated 20% of the patients.[10,11]

Different mechanisms of esophageal acid-induced bronchoconstriction include a vagal-reflex, local axonal reflexes, bronchial hyper-reactivity, and microaspiration. Asthmatics are predisposed to GERD development because of a high prevalence of hiatal hernia, autonomic dysfunction and an increased pressure gradient between the abdominal and thoracic cavity. Asthma medications may cause GERD.Current study included 100 patients. All the patients were asthmatics (> 12% or 200ml increase in $FEV_1$ on pulmonary function tests after inhaled short acting bronchodilator). The study population had equal age distribution with majority of the subjects belonging to middle age groups. This is shown in **Fig-2.** Maximum number of subjects 42% (n=42) were 31-40 years old. Mean age of study population was calculated as 41.79 years±SD of 9.872. Asthma is more prevalent in middle age, with low prevalence in extremes of age.

This study population had 59% female patients and 41% male patients, as shown in **Fig-3.** These results supported the evidence that females are more affected by asthma in post-pubertal period. In pre-pubertal period, males are more affected than females and in pubertal period, both are equally affected. Since this study was conducted in post-pubertal population, the results were in accordance with the normal epidemiological data. The prevalence of GERD in asthmatics was found to be highest (14 patients) in 31-40 years old asthmatics. This was followed by 11 patients in 41-50 years old, as shown in **Table-1.**

Results were further segregated according to age groups and gender in GERD confirmed cases, as shown in **Fig-5.** There was similar gender distribution of GERD among all age groups with the maximum number of cases in 31-40 years old asthmatics. Amongst GERD confirmed cases, 34% were females and 32% were males. **(Fig-4)** The results of different studies investigating the prevalence of GERD in asthmatic patients vary greatly. It ranges from 25% to 80% in different

to calculate frequency and compare the results with pre-existing data. Field et al. [12] carried out a questionnaire-based, cross-sectional survey. Results showed that 70% of asthmatics admitted to some type of gastroesophegeal reflux symptoms, which was significantly higher than the control group. Among asthmatics, 77% had heartburn, 55% had regurgitation, 24% had dysphagia.

In another study, asthmatics were randomly selected from a multicenter group. Of the 90 asthmatics who participated, 51% had symptoms of GERD.[13] Perrin-Fayolle et al.[14] found evidence of GERD symptoms in 65% asthmatics. And 72% of asthmatics had heartburn in a study conducted by Sontag et al[15] The results of these four studies were very similar. If data of these four studies is taken as a group, it shows that 68% of asthmatics suffered from GERD symptoms. Another large scale study conducted in Turkey showed that the prevalence of GERD was higher in asthmatics compared to the control group. (25.4% vs. 19.4%, $p<0.05$)[16] The results of the current study showed that the frequency of GERD in asthmatics was found to be 33%. This prevalence rate is in agreement with few other studies. The prevalence rate of GERD in asthma patients was 36% in a study conducted by Kiljander.[13] Similar prevalence rates of 36% were calculated by Onyek were,[17] who also utilized the FSSG questionnaire.

Different population studies showed different prevalence rates. No such data is available from Pakistani population, and hence no local guidelines are present regarding treatment of GERD in asthma. This study was conducted with the intention to calculate frequency of GERD in our population of asthma patients and to provide data for future researches. Treatment of GERD in patients of asthma is an important step in managing asthmatics. Local guidelines should be made regarding treatment of GERD in asthma based upon local data.

## Conclusion

Epidemiologic data has consistently shown, with varying frequencies, an association between GERD and asthma. There is a high frequency of GERD in patients with asthma in our population. So it is recommended that all the patients presenting with asthma should be questioned about symptoms of GERD, for better and focused management plan.

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