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Frequency of Clinical symptoms of Gastroesophageal Reflux Disease in Asthmatic Patients	
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<p>Abstract:</p> <p>Background: Gastroesophageal reflex is known as an acid reflex, is long term condition where stomach contents back into the oesophagus resulting in either symptoms or complications. GERD disease is caused by weakness or failure of the lower oesophageal sphincter. Symptoms include the acidic taste behind the mouth, heart burn, chest pain, difficult breathing and vomiting. Complication includes esophagitis, oesophageal strictures and barrettes oesophagus.</p> <p>Objective: The aim of this research was to introduce the symptoms of GERD disease in asthmatic patients and how these symptoms worsen the symptoms of asthma disease and what clinical pictures present with the asthmatic disease.</p> <p>Methodology: A designed performa was used to collect the data and after filling the performa, results were drawn and conclusion through the facts and the information given by patients.</p> <p>Results: In the present study among all 164 asthmatic patients, 70 (42.7%) patients showed dyspepsia, 58 (35.4%) were with chest burning, 23 (14%) were asking about chest pain, with acidic mouth taste were 39 (23.8%), 22 (13.4%) were feeling sore throat and 44 (26.8%) showed regurgitation reflex. Among these 164 patients 16 (9.8%) were smokers and 148 (90.2 %) were non-smokers. 47 (28.7%) were males and 117 (71.3%) were females.</p> <p>Conclusion: It is concluded that gastroesophageal reflux disease in asthmatic patients present symptoms of acidic mouth taste, chest burning, chest pain, dyspepsia, regurgitation reflex and sore throat.</p> <p>Keywords: GERD, Dyspepsia, Chest burning, Chest pain, Regurgitation</p>	
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Introduction:

Gastroesophageal reflex is known as an acid reflex, is long term condition where stomach contents back into the oesophagus resulting in either symptoms or complications (1). GERD disease is caused by weakness or failure of the lower oesophageal sphincter (2). Symptoms include the acidic taste in back of the mouth, heart burn, chest pain, difficult breathing and vomiting.

Complication include esophagitis, oesophageal strictures and barrettes oesophagus (1). Risk factors are obesity, pregnancy, smoking, hiatus hernia, antidepressants and sleeping medications (1). The gold standard test for the diagnosis of GERD disease is 24 hours Ph monitoring. Another test in which improvement of symptoms occur after giving a proton pump inhibitors is a positive test for GERD disease

(3). Oesophageal manometry is required only prior to surgery (4). Investigations may need gastroduodenoscopy and endoscopy (4). Lying down on bed at least three hours after meal, reduce weight, avoids certain foods, stop smoking, not lying down on bed after eating. antacids, H₂ receptor blocker, Proton pump inhibitors, Prokineti. Surgery is recommended in severe cases (5). In western world 10 to 20 % population are affected by a GERD disease (5). The GERD condition was first described by an American gastroenterologist ASHER WINKELSTEIN 1935 (6). A common long term inflammatory disease of the airways of the lungs is called asthma (7). It is characterized by reversible airflow obstruction and bronchospasm (8). The symptoms of asthma include episodes of coughing, wheezing, shortness of breath, and chest tightness (9). These episodes of asthma occur mostly in day time or per week or in the night time. Thy symptoms of asthma may worse at night or during exertion (10). Asthmatic disease usually occurs due to various environmental and genetic factors. Environmental factors are exposure to air, pollution and various allergens. The other triggers include medications such as aspirin and beta blockers (10). The diagnosis of the asthma depend on major symptoms, response to therapy over time, and spirometry values (11). The classification of the asthma is on the basis of the frequency of symptoms, (FEV₁) values, and peak expiratory flow rate (12). Asthmatic disease may be classified as atopic or non-atopic. Atopy refers to a predisposition toward developing type 1 hypersensitivity reaction (13, 14). There is no treatment or cure for asthma (15). The symptoms of the asthma can be prevented by avoiding from the triggering

factors, such as irritants and allergens, and with the use of inhaled corticosteroids (16, 17). The rapid treatment for worsening symptoms of asthma is usually with an inhaled short-acting beta-2 agonist such as salbutamol and corticosteroids. (18). In very severe cases intravenous drugs used e.g corticosteroids, magnesium sulfate and hospitalization may be required (19).

In 2015, 358 million people globally had asthma, up from 183 million in 1990 (19, 20). It caused about 397,100 deaths in 2015, most of which occurred in the developing world (10). It often begins in childhood (21). The rate of asthma have increased significantly since the 1960s (22). Asthma was recognized as early as Ancient Egypt (23). A total of 20 articles that described 5706 patients fulfilled the inclusion and exclusion criteria. Seventeen studies used objective methods for documenting reflux (e.g., pH probe, contrast imaging, impedance, and esophagogastroduodenoscopy), 2 studies relied on symptom-based questionnaires, and 1 study used diagnostic codes. Most studies ($n = 19$) examined the prevalence of GERD in 3726 individuals with asthma and reported highly variable estimates (19.3%–80.0%) and a pooled average of 22.8% with GERD symptoms, 62.9% of 789 patients with abnormal oesophageal pH, and 34.8% of 89 patients with esophagitis. Only 5 studies included controls and enrolled 1314 case-patients with asthma and 2434 controls without asthma. The average prevalence of GERD was 22.0% in asthma cases and 4.8% in controls (pooled odds ratio: 5.6 [95% confidence interval: 4.3–6.9]) (24).

The aim of this research is to introduce the symptoms of GERD disease in asthmatic patients and how these symptoms worsen the symptoms of asthma disease. And what

clinical pictures presents with the asthmatic disease.

Material and Methods:

Study design: This was Cross-sectional study.

Setting: Ward, OPDs and ICUs of Gulab Devi Chest Hospital.

Duration: The duration of study was 6 months.

Sample size: 164 asthma patients were required for the purpose to complete this research. Sample was calculated using $p=16\%$ (25), $d=5\%$ using the following formula:

$$n = \frac{Z^2_{1-\alpha/2} P (1-P)}{d^2}$$

Sampling technique: Purposive sampling technique was used to collect the data.

Sample selection criteria:

Inclusion criteria: Cases of bronchial asthma were taken on the basis of clinical symptoms, sign and pulmonary function test showing airway reversibility of 12 percent and 200 ml in FEV1.

Exclusion criteria: COPD patients and Asthmatic patients taking any medications known to cause upper gastro intestinal adverse effect like oral steroids and theophylline.

Methodology: A designed performa was used to collect the data and after filling the performa we draw results and conclusion through the facts and the information given by patients.

Analysis procedure: The data was entered and analysed by using SPSS version 20. The quantitative data like age was presented in the form of mean \pm SD. While the qualitative data like GERD symptoms and gender were presented in the form of charts along its percentage.

Operational definitions:

GERD is a digestive disorder that affects the lower oesophageal sphincter (LES), the ring of muscle between the oesophagus and stomach.

Asthma is a chronic (long-term) lung disease that inflames and narrows the airways. Asthma causes recurring periods of wheezing (a whistling sound when you breathe), chest tightness, shortness of breath, and coughing.

Dyspepsia is a common condition and usually describes a group of symptoms rather than one predominant symptom. These symptoms include Belly pain or discomfort, Bloating, feeling uncomfortably full after eating, Nausea, Loss of appetite, Heartburn, Burping up food or liquid (regurgitation) and Burping.

Results:

Age distribution: Minimum age was 13 years in this research and maximum was 70 years, the age distribution was 40.04 ± 12.34 .

Gender Distribution: Among 164 patients 47 were males and 117 were females.

Marital status: 143 were married and 21 were unmarried among 164 patients.

Smoking Habit: Out of 164 patients, only 16 showed smoking habit while 148 did not.

Dyspepsia: Dyspeptic problem was shown in 70 patients and 94 didn't show this problem.

Chest Burning: In 164 patients 58 patients complained that they feel chest burning and 106 did not feel this.

Chest Pain: 23 patients felt chest pain and 141 did not feel this problem among 164 patients.

Oral acidic taste: Among 164 patients 39 patients were feeling acidic taste in mouth but 125 patients didn't feel this.

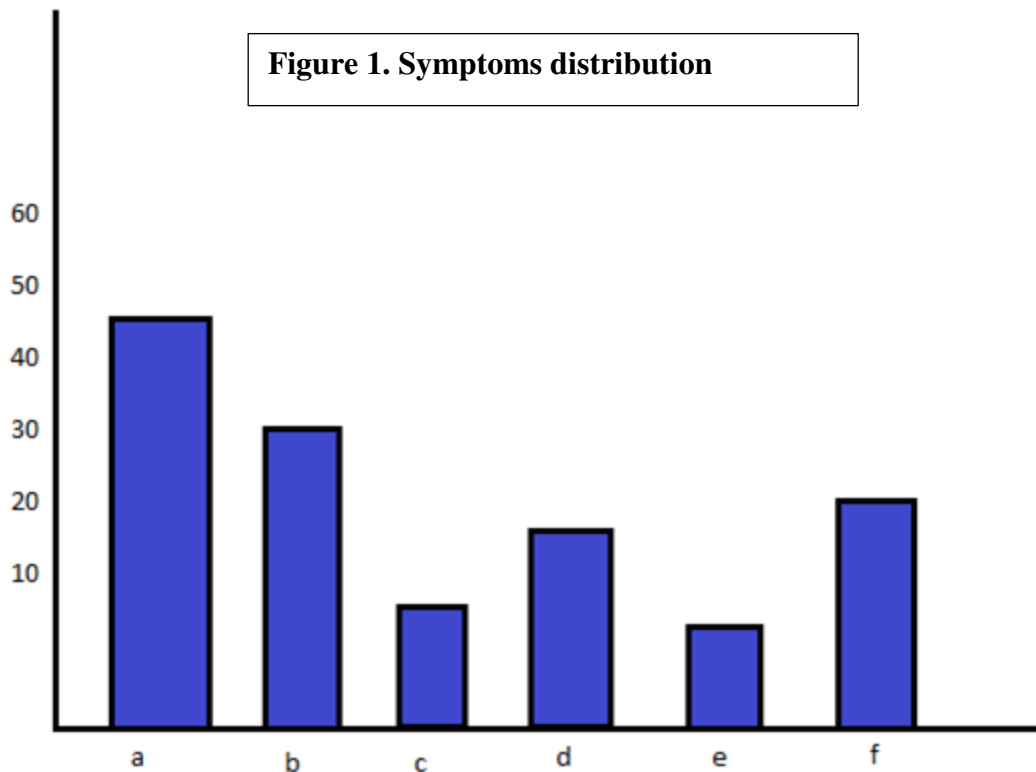
Sore Throat: 22 patients were with sore throat and 142 were not complaining among all 164 patients.

Regurgitation of food or acid reflex: In 164 patients 44 patients showed anti-reflex and 120 showed normal characteristics related to this aspect.

Symptoms distribution: The symptom distribution is shown in **Error! Reference source not found.** and in this figure, “a”

Among these 164 patients 16 (9.8%) were smokers and 148 (90.2 %) were non-smokers. 47 (28.7%) were males and 117 (71.3%) were females.

According to a research conducted in 2003, chest burn and acid regurgitation of moderate severity or above were present in 12.1% and



shows dyspepsia that was 42.7%, “b” was chest burning 35.4%, “c” was chest pain found in 14%, “d” was used for acidic taste in mouth its 23.8%, “e” was sore throat and was 13.4% and ‘f’ was the regurgitation of food that was 26.8%.

Discussion:

In the present study among all 164 asthmatic patients, 70 (42.7%) patients showed dyspepsia, 58 (35.4%) were with chest burning, 23 (14%) were asking about chest pain, with acidic mouth taste were 39 (23.8%), 22 (13.4%) were feeling sore throat and 44 (26.8%) showed regurgitation reflex.

19.6%, respectively. And among 659 patients, dyspepsia were informed in 29.3 % patients, acidic feeling in mouth was shown in 45.52 % patients (26)

In a study ($n = 19$) examined the prevalence of GERD in 3726 individuals with asthma and reported highly variable estimates (19.3%–80.0%) and a pooled average of 22.8% with GERD symptoms, 62.9% of 789 patients with abnormal oesophageal pH, and 34.8% of 89 patients with esophagitis (24).

There is a great difference between this research and the previous researches. The

main reason of this difference is that there are highly improved facilities, related to health and medications. There is a change in awareness of treatment and prevention of GERD. The asthmatic patients use medications, therapies and facilities to cure asthma and to reduce the symptoms of GERD disease.

The prevalence rates of heartburn and acid regurgitation over the past year were 8.9% and 25.9%, respectively. The 1-year prevalence of GERD was 29.8%. The age, gender distribution and socio-economic status were similar between subjects with GERD and subjects without. For subjects with GERD over the past year, the prevalence rates were similar between males and females, except for subjects ≥ 55 years of age, in whom the prevalence was higher in males. For subjects with frequent GERD (at least monthly), the prevalence rates were similar between males and females. The prevalence of GERD was similar between different occupations. For subjects with GERD over the past year, heartburn and acid regurgitation of moderate severity or above were present in 12.1% and 19.6%, respectively. GERD symptoms (heartburn and/or acid regurgitation) of moderate severity or above were significantly more frequent in subjects with frequent GERD (at least monthly) (28.5% vs. 50.5%, $P < 0.001$). The annual, monthly and weekly prevalence rates of non-cardiac chest pain were 19.5%, 5% and 1%, respectively, and dyspepsia was present in 17.1% of the study subjects. There was a considerable overlap between dyspepsia, non-cardiac chest pain and GERD symptoms over the past year.

Conclusion: It is concluded that among all 164 asthmatic patients, 70 (42.7%) patients

showed dyspepsia, 58 (35.4%) were with chest burning, 23 (14%) were asking about chest pain, with acidic mouth taste were 39 (23.8%), 22 (13.4%) were feeling sore throat and 44 (26.8%) showed regurgitation reflex.

Conflict of interest: Authors do not have any conflict of interest.

Human & Animal Rights: No human or animal rights were harmed during the study.

Informed Consent: An informed consent was obtained from participants.

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Supplementary File 1:
Study Questionnaire

Name: _____

S/O, D/O, W/O: _____

Age: _____ years

Gender:

Male

☐

Female

☐

Address: _____

Ward: _____

Hospital: _____

Date: ____/____/____

Marital status: Married

Yes

☐

Unmarried

☐

Smoking: Yes

☐

No

☐

Asthma Diagnosis: Yes

☐

No

☐

Dyspepsia: Yes

☐

No

☐

Burning sensation in chest: Yes

☐

No

☐

Chest pain: Yes

☐

No

☐

Acidic taste in mouth: Yes

☐

No

☐

Sore throat: Yes

☐

No

☐

Regurgitation of food or acid reflex: Yes ☐ No ☐

CONSENT: it is informed me that this group is conducting a research on “Frequency of Clinical symptoms of GERD in asthmatic patients” to improve health facilities related to this disease and ensured me that my data will not be misused. So I’m agree to give my personal data to him.

Name:

Signature:
