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# Prevalence of Peptic Ulcer Disease in Patients with Chronic Obstructive Pulmonary Disease in a Teaching Hospital

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## Abstract

**Objective: Chronic obstructive pulmonary disease is major cause of chronic morbidity and mortality throughout the world. Peptic ulcer disease is not uncommon in patients with chronic medical condition like chronic obstructive pulmonary disease. Patients who smoke or have chronic obstructive pulmonary disease carry higher risk of developing peptic ulcer disease. The aim of this study was to saw the prevalence of peptic ulcer disease as well as prevalence variation in relation with severity of chronic obstructive pulmonary disease. Methods: This was cross sectional observational study from January, 2013 to January, 2014 in department of Medicine, Rajshahi Medical College Hospital, Rajshahi who fulfilled the inclusion & exclusion criteria were selected in this study. Data was collected in a prefixed questionnaire form and data collection sheet after taking informed consent of the patient. All the patients were investigated with spirometry, chest X-ray, complete blood count, electrocardiogram, echocardiography and endoscopy upper gastrointestinal tract. Results: Among the study population 100% patient was male. Most of them were 51-60 years (42.4%) with mean aged was 56.48 ± 7.64 years. Endoscopic finding was normal (55, 85.94%), gastritis (02, 3.12%), gastric erosion (03, 4.69%), peptic ulcer (03, 4.69%) and peptic ulcer with active bleeding (01, 1.56%).Prevalence of peptic ulcer disease in this study was 14.06%.**

**Conclusion: Prevalence of peptic ulcer was more in chronic obstructive pulmonary disease patient than normal population. The prevalence of peptic ulcer diseases also increases with the severity of the disease.**

**Key words: Chronic obstructive pulmonary disease, spirometry, Endoscopy upper gastrointestinal tract**

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## Introduction

Chronic Obstructive Pulmonary Disease (COPD) is major cause of chronic morbidity and mortality throughout the world. Many people suffer from this disease for years and die prematurely from it or its complications. COPD is the fourth leading cause of death and affects >16 million persons in the United States. COPD is also a disease of increasing public health importance around the world. GOLD estimates suggest that COPD will rise from the sixth to the third most common cause of death worldwide by 2020.The most recent update of the Global Initiative for Chronic Obstructive Lung Disease (GOLD)[1,2] defines chronic obstructive pulmonary disease (COPD) as: "a preventable and treatable disease with some significant extra pulmonary effects that may contribute to the symptom characterized by

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airflow limitation that is not fully reversible. The airflow limitation is usually progressive and associated with an abnormal inflammatory response of the lung to noxious particles or gases." A systemic review and meta- analysis of studies carried out in 28 countries between 1990 and 2004 [3] and additional study from Japan [4] provide that the prevalence of COPD is appreciably higher in smoker and ex- smoker than in non- smoker, in those over 40 years than those under 40, and in men than in women. In Bangladesh a study carried out in 2007 showed that prevalence of COPD in >40 years population was 21.24% and the overall prevalence of COPD in total population of Bangladesh is estimated to be 4.32%. About 80% of smokers need to smoke only around 10 pack years to catch the disease.[5] Peptic ulcer is a common disease of gastrointestinal tract. Peptic ulcer is ulcer in stomach and duodenum. The overall prevalence of gastrointestinal ulcer is 8.4%.[6] Gastric ulcer is usually single, men>women, most common among elderly, 90% are situated on the lesser curve within the antrum or at the junction between body and antral mucosa. Chronic duodenal ulcer usually occurs in the 1st part of duodenum just distal to the junction of pyloric and duodenal mucosa; 50% are on anterior wall. It is 1.5 times as common as gastric ulcer; peak incidence for duodenal ulcer is in 5th decade in men & 6th decade in women. Peptic ulcer is strongly associated with H. pylori infection. There are many risk factors for the pathogenesis of PUD like male sex, 1st degree relative with duodenal ulcer, H. pylori infection found in 90% of patients with duodenal ulcer & 60-80% of patients with gastric ulcer, cigarette smoking, genetic marker, NSAIDs & COX-2 inhibitor, corticosteroids, Zollinger- Ellison Syndrome, chronic renal failure, COPD, alcoholic cirrhosis, hyperparathyroidism, post-surgical, organic nitrates, physiologic stress, caffeine, psychosocial stress. Clinically PUD present with midline epigastric discomfort, gnawing feeling, gnawing, burning often not actual pain, sometime also nausea &/or vomiting. For duodenal ulcer, discomfort usually occurs 1-3 hours after eating, often during sleep, relieved by food, antacids or vomiting.[7,8] Although Helicobacter pylori (H. pylori) infection and the use of Non-steroidal anti-inflammatory drugs (NSAIDs) play important roles in peptic ulcer formation and bleeding.[9] A small number of epidemiological and serologic case-control studies suggest that patients with chronic obstructive pulmonary disease have an increased sero-prevalence of H. pylori. The activation of inflammatory mediators by H. pylori infection might be the pathogenic mechanism of the observed association.[10] The Acta Med Iran 2011 results suggest that there was no significant association between H. pylori IgG seropositivity and COPD.[11]Peptic ulcer disease is not uncommon in patients with chronic medical condition like liver cirrhosis, renal failure and COPD. Patients who smoke or have COPD carry higher risk of developing peptic ulcer disease.[12-14] Moreover; COPD patients often have others smoking related chronic diseases, such as hypertension, coronary artery disease, or heart failure, and use similar medication, including anti-platelet drugs or corticosteroids. These drugs may be ulcerogenic or delay ulcer healing.[15-17] Peptic ulcer bleeding remains a major healthcare problem[18] with substantial economic impact[19,20] despite decreasing peptic ulcer disease prevalence.[21,22] Recent concept that COPD is no longer a localized inflammatory disease limited to the lungs but is a systemic inflammatory disease [23, 24] that may be associated with other systemic diseases like hypertension, diabetes, cardiovascular disease or chronic kidney disease.[25-27]

## Materials and Methods

A total of 64 COPD patients attending at medicine department of Rajshahi medical college hospital were included in this study. Patient age < 40 years, > 70 years, other known co-morbidities like carcinoma stomach, bronchial asthma, DPLD, LVF, carcinoma lungs, very advanced COPD and old delineated patients who cannot perform spirometry and Endoscopy upper GIT were excluded from the study. The study was carried out in the department of Medicine at Rajshahi Medical College Hospital, Rajshahi from January 2013 to January 2014. It was cross sectional observational study. SPSS version 10.0 was used for statistical analysis.

## Results

The maximum numbers of study subject (43.75%, 28/64) were 51-60 years with mean age 56.48±7.64 years. In this study most of the patients (34.38%, 22/64) were farmer and primary level of education (42.19%, 27/64). Majority of the patients (60.94%, 39/64) used tobacco at least >20 pack-years. (Table: 1) Present study showed that mean FEV1 (SD) (% of predicted) was 36.01% (±12.23), 42.19% (27/64) had FEV1 < 40% of the predicted i.e. severe obstructive disease. Only 18.75% of the patients were in mild category. (Table: 2)

Table-1: Demographic profile of study population (n=64)

| Age (years) | Number of patient | Percentage |
|---|---|---|
| 40-50 | 20 | 31.3 |
| 51-60 | 26 | 40.6 |
| 61-70 | 18 | 28.1 |
| Total | 64 | 100.0 |
| Mean ±SD | 56.48±7.64 | |
| Occupation | | |
| Farmer | 22 | 34.4 |
| Business | 18 | 28.1 |
| Service holder | 10 | 15.6 |
| Fisherman | 6 | 9.4 |
| Retired | 2 | 3.1 |
| Housewife | 0 | 0.0 |
| Others | 6 | 9.4 |
| Smoking class | | |
| Active | 64 | 100.0 |
| Passive | 0 | 0.0 |
| Smoking status | | |
| Current smoker | 35 | 54.7 |
| Ex-smoker | 29 | 45.3 |
| Pack year | | |
| 10-20 packs/year | 25 | 39.1 |
| > 20 packs/year | 39 | 60 |

Table-2: Distribution of COPD patients according to severity of the disease (post-bronchodilator FEV1) (n=64)

| Degree | FEV1 | No of case | Percentage (%) |
|---|---|---|---|
| Mild | >80 | 12 | 18.75 |
| Moderate | 50-80 | 25 | 39.06 |
| Severe | 30-49 | 19 | 29.69 |
| Very severe | <30 | 08 | 12.50 |
| Total | | 64 | 100.0 |

Table-3: Endoscopic finding of the study patients (n=64)

| Endoscopy | Number of patients | Percentage (%) |
|---|---|---|
| Normal | 55 | 85.94 |
| Erosion | 03 | 4.69 |
| Gastritis | 02 | 3.12 |
| Ulcer | 03 | 4.69 |
| Ulcer with active bleeding | 01 | 1.56 |
| Total | 64 | 100.0 |

Endoscopic finding of study subject was normal (55, 85.94%), gastritis (02, 3.12%), gastric erosion (03, 4.69%), peptic ulcer (03, 4.69%) and peptic ulcer with active bleeding (01, 1.56%). (Table: 3)Prevalence of peptic ulcer disease in this study was 14.06% (9/64). (Table: 4)

Table-4: Prevalence of peptic ulcer in COPD patient:

| Endoscopic finding | Number of patients | Percentage (%) |
|---|---|---|
| Peptic ulcer | 9 | 14.06 |
| Normal | 55 | 85.94 |

Table-5: Endoscopic findings in relation with severity of the COPD (n=64)

| Endoscopic findings upper GIT | | Degree of COPD | | | | Total |
|---|---|---|---|---|---|---|
| | | Mild (FEV1 >80) | Moderate (FEV1 50-80) | Severe (FEV1 30-50) | Very Severe (FEV1 < 30) | |
| Normal | No | 12 | 23 | 16 | 4 | 55 |
| | % within degree of COPD | 100.0% | 92.0% | 84.21% | 50.0% | 85.94% |
| Erosion | No | 0 | 1 | 1 | 1 | **3** |
| | % within degree of COPD | 0 | 4.0% | 5.27% | 12.5% | 4.69% |
| Gastritis | No | 0 | 0 | 1 | 1 | **2** |
| | % within degree of COPD | 0 | 0 | 5.26% | 12.5% | 3.12% |
| Ulcer | No | 0 | 1 | 1 | 1 | **3** |
| | % within degree of COPD | | 4.0% | 5.26% | 12.5% | 4.69% |
| Ulcer bleeding | No | 0 | 0 | 0 | 1 | **1** |
| | % within degree of COPD | | | | 12.5% | 1.56% |
| Total | No | 12 | 25 | 19 | 8 | 64 |
| | % within degree of COPD | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

## Discussion:

Chronic obstructive pulmonary disease is one of the leading causes of chronic morbidity and mortality worldwide. This may reflect the actual real-life conditions and coincide with a recent concept that COPD is no longer a localized inflammatory disease limited to the lungs but is a systemic inflammatory disease[14,15] that may be associated with other systemic diseases like hypertension, diabetes, cardiovascular disease or chronic kidney disease.[16-18] COPD patients indeed had a higher risk of developing peptic ulcer bleeding than the general population.[28] There may be several reasons why COPD increases peptic ulcer risk. First, COPD is characterized not only by chronic local but also by systemic inflammation.[15] Thus, COPD patients are exposed to oxidative stress secondary to chronic hypoxia and produce reactive oxygen species (ROS)[21,22] that may damage gastric or small intestinal mucosa.[23] Second, COPD patients share other smoking-related chronic diseases, such as hypertension, coronary artery disease, or heart failure, and have more instances using anti-platelet agents, which protect against cardiovascular events but increase ulcer bleeding risk.[24, 25] Third, COPD patients often need steroids for controlling lung inflammation. Steroid-induced peptic ulcer disease is controversial but steroids reportedly delay peptic ulcer healing.[5, 6, 26-27, 29]

Previous studies also showed that smoking and COPD were risk factors of peptic ulcer disease.[2-4] Present study found that COPD patients had a higher proportion of peptic ulcer than normal population (14.06% vs. 8.4%).[6,14] Previously, most studies for evaluating the risk factors of peptic ulcer disease mainly focused on NSAIDs or aspirin use, or H. pylori infection. Very few

studies delved on the relationship between peptic ulcer bleeding and smoking or COPD. A population-based cohort study in Denmark showed that smoking was a risk factor for ulcer perforation but not for ulcer bleeding.[19] The other case–control study found that patients with co-existing lung disease increased the risk of ulcer bleeding (OR: 2.5, 95% CI 1.40–4.46) but did not specify the associated lung disease.[20] In this study, endoscopic changes correlated with the severity of the disease. Prevalence of peptic ulcer in this study was 14.06% which was similar to previous study done by Schneider et al. Latts et al. & Green and Dundee which showed that peptic ulcer was 14.8%, 15.4% & 19.0% respectively.[30-32] But higher prevalence also found by Weber & Gregg, Plotkin and Lowell et al. study (42.8%, 32.0% & 24.0% respectively). [33-35]

## Conclusion:

COPD is more common in males and usually occurs in the 5th and 6th decade. Most of the patients have fairly advanced disease at presentation. Patients with COPD have a higher risk of developing peptic ulcer. Older age, male sex, hypertension, diabetes, peptic ulcer history and NSAIDs are important risk factors for peptic ulcer in COPD patients. Endoscopy upper GIT are better method in detecting peptic ulcer disease in COPD. Prevalence of peptic ulcer disease was more in relation with severe form of COPD.

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