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The Pattern of Osteoporosis in Chronic Obstructive Pulmonary Disease (COPD) in Bangladeshi Patients

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Abstract **Original Research Article**

Objective*:** In this study our main goal is to assess the pattern of Osteoporosis in Chronic obstructive Pulmonary Disease (COPD) in Bangladeshi Patients. ***Method: This observational type study was carried out at the tertiary medical college and hospital from February 2017 to February 2018.A total of 50 patients of acute exacerbation meeting the selection criteria were consecutively included in the sample. ***Results:*** most of the patients belong to >40 years age group, 53.30% only 20% patients where female, where 80% were male out of 50 patients, (56.7%) presented with current smoker and only (6.7%) with nonsmoker person. According to T-score in lumbar spine, normal bone mineral density was in (6.7%), osteopenia in (28.3%) and osteoporosis in (65.0%) patients. ***Conclusion*:** From our study we can conclude that, our findings highlight the potential value of studying BMD and reinforce the need for earlier identification and targeting of risk factors for osteoporosis as part of the management of COPD. However further study is required for better outcome.

Keywords: Osteoporosis, Chronic obstructive Pulmonary Disease (COPD), lumbar spine.

INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is a major cause of morbidity and mortality in adults and is the fourth leading cause of death in the world [1]. It is characterized by chronic air flow limitation that is usually progressive [2]. COPD is now considered as a multicomponent disorder associated with systemic inflammation and extra pulmonary manifestations [3].

Osteoporosis is a systemic skeletal disease characterized by a low bone mineral density (BMD) and micro architectural changes in bones leading to an increased bone fragility and, in turn, resulting in an increased fracture risk. The prevalence of osteoporosis in COPD patients is 2-foldto 5-fold higher than in age-matched subjects without air flow obstruction [4, 5]. Osteopenia is present in 35-72% of patients with COPD, and 36-60% of patients with COPD have been reported to be osteoporotic. Moreover, COPD patients have a 60 to 70% higher risk of death following hip fracture than people without COPD. It is therefore of high clinical importance to diagnose and treat osteoporosis in COPD according to international guidelines [6].

In this study our main goal is to evaluate the pattern of Osteoporosis in Chronic obstructive Pulmonary Disease (COPD) in Bangladeshi Patients.

OBJECTIVE

General Objective

- To assess the pattern of Osteoporosis in Chronic obstructive Pulmonary Disease (COPD) in Bangladeshi Patients.

Specific objective

- To detect basal characteristic of the patients.
- To identify stages of COPD in the patients.

METHODOLOGY

Study type:

- The study was a observational study.

Place and period of study

- The study was carried out at the tertiary medical college and hospital from February 2017 to February 2018.

Sample Size

- A total of 50 patients of acute exacerbation meeting the selection criteria were consecutively included in the sample.

Inclusion Criteria

- Previously diagnosed or newly diagnosed COPD according to GOLD criteria.

Exclusion Criteria

- Patients who had asthma, any disease affecting bones and calcium homeostasis or were receiving drugs related to bone metabolism

Detailed Procedure

In all cases a detailed history and clinical examination were done. Demographic data were collected including age, smoking history, inhaled corticosteroid use, alcohol consumption, menopausal history in case of female cases, comorbidities, duration of treatment, long term domiciliary oxygen therapy, body mass index, treatment history, hospital admission. Which were recorded in data entry from.

Data Analysis

- Collected data were analysed using software SPSS (Statistical Package for Social Sciences) version 11.5 for windows. Descriptive statistics were used to analyse the data. Analysed data were presented in the form of tables and charts with due interpretation.

RESULT

In Figure-1 shows age distribution of the patients where most of the patients belong to >40 years age group, 53.30%. The following figure is given below in detail:

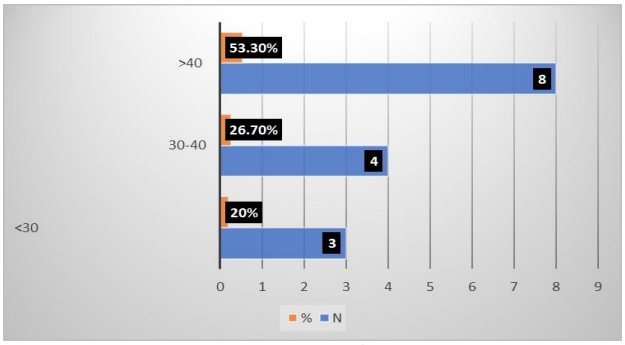

Fig-1: Age distribution of the patients

In Table-1 shows gender distribution of the patients where only 20 % patients where female, where 80% were male. The following table is given below in detail:

Table-1: Gender distribution of the patients

Gender	%
Male	80%
Female	20%

In Figure-2 shows distribution of the patients according to occupation where most of the patients were day laborer, 63.60%. The following figure is given below in detail:

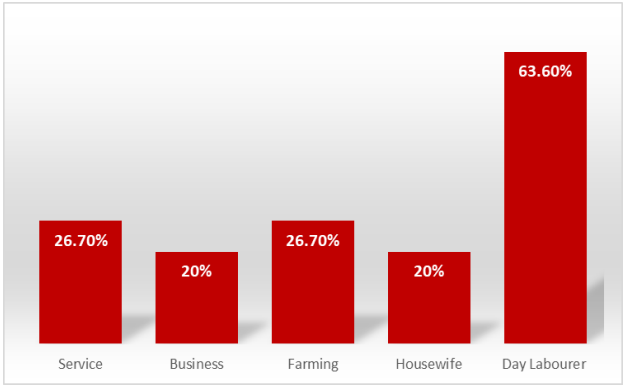

Fig-2: Distribution of the patients according to occupation

In Table-2 shows baseline characteristics of the patients where out of 50 patients, (56.7%) presented with current smoker and only (6.7%) with nonsmoker person. The following table is given below in detail:

Table-2: Distribution of patients by baseline characteristics (n = 50)

Baseline characteristics	Percentage
Weight (kg), mean±SD	54.92±9.17
Height (cm), mean±SD	155.10±13.02
BMI, mean±SD	23.09±4.82
Tobacco use: Current smoker Ex-smoker Never smoker	 56.7% 36.7% 6.7%

In Table-3 shows distribution of patients by severity of COPD where, majority (58%) of the patients belong to stage III. The following table is given below in detail:

Table-3: Distribution of patients by Severity of COPD

Severity of COPDPercentage	
Stage-II	5
Stage-III	58
Stage-IV	39

In Table-4 shows distribution of patients by BMI where according to T-score in lumbar spine, normal bone mineral density was in (6.7%), osteopenia in (28.3%) and osteoporosis in (65.0%) patients. the following table is given below in detail:

Table-4: Distribution of patients by BMI

Activity level	Femoral neck Percentage Lumbar spine Percentage
T-score	-2.31 ± 0.96-2.92 ± 1.33
Normal	10.0% 6.7%
Osteopenia	40.0% 28.3%
Osteoporosis	50% 65.0%

DISCUSSION

In this study the age of the patients of COPD ranged from<30 to>40 years and most of the patients belong to >40 years age group, 53.30%. This result was quite similar to the one study where mean age of the COPD patients was 62.8 ±5.6 years. This result also correlated with other studies [6-8].

In this study we found that, 56.7%) presented with current smoker and only (6.7%) with nonsmoker person.

In one study it was reported that, mean smoking-pack year was36.8±17.2 (range, 10-90) pack-years [8].

Another study said that, mean duration of COPD was 5.4± 3.3 years (range, 1-15 years); the duration of COPD was1 to 5 years in 38 (63.3%), 6 to 10 years in 18 (30.0%) and 11 to 15 years in 4 (6.7%) patients [7]. One article reported that COPD duration was 1 year in 13.1%, 1-5years in 31.2% and above 5 years in 55.8% of patients [9].

In our study we noticed that, majority (58%) of the patients belong to stage III. Which was supported by one study, where they found that GOLD stage-III was the most frequent severity of COPD constituted 56.7% cases, followed by stage-IV(38.31%) and stage-II (5.0%) [10].

One study showed that use of oral steroid in 7 (11.7%) patients, inhaled steroid was in 38 (63.3%) and 15(25.0%) patients did not use any types of steroid [11]. Another study reported that oral corticosteroid in 4.5%, inhaled corticosteroid in 54.1% and both oral and inhaled corticosteroid in 10.6% cases of COPD [12].

In our study, according to T-score in lumbar spine, normal bone mineral density was in (6.7%), osteopenia in (28.3%) and osteoporosis in (65.0%) patients.

One study reported that, BMD in femoral neck was 0.77 ± 0.17gm/cm2 (range, 0.58 to 1.03) [8]. This result was almost similar to the other study where BMD in femoral neck was 0.74 ± 0.11 gm/cm2 in men with chronic obstructive pulmonary disease [9].

CONCLUSION

From our study we can conclude that, our findings highlight the potential value of studying BMD and reinforce the need for earlier identification and targeting of risk factors for osteoporosis as part of the management of COPD. However further study is required for better outcome.

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