

Clinico-Demographic characteristics of Patients Presented with exudative Pleural Effusion

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Abstract

Background: Pleural effusion can occur with varied clinical presentations. **Objective:** The purpose of the present study was to see the demographic characteristics and clinical profiles of patients presented with exudative pleural effusion. **Methodology:** This cross-sectional study was carried out at medicine indoor department of Sylhet MAG Osmani Medical College Hospital, Sylhet over a period of six month from October 2009 to March 2010. Patients who were admitted with pleural effusion were selected as the study population. Pleural fluid was collected by a physician. The laboratory tests were performed in the Department of Laboratory medicine of the Hospital. The details history of age, sex, socio-economic condition, clinical features were collected from the patients. **Results:** A total of 50 cases were selected consecutively in the study. The mean age of the patients was 44.5±12.86 years. Male to female ratio was 2.1:1. Over half of the patients (54.0%) was poor; 32.0% cases was middle class and 14.0% cases was rich. Low-grade fever (92.0%), cough (86.0%), weight loss (74.0%) and dyspnoea (56.0%) were found as the most common symptoms of exudative pleural effusion. **Conclusion:** In conclusion middle age adult male living in poor socio-economic condition are most commonly suffering from exudative pleural effusion. [Journal of National Institute of Neurosciences Bangladesh, July 2022;8(2):167-170]

Keywords: Clinico-demographic characteristics; exudative; pleural effusion

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Introduction

Pleural effusion is defined as an abnormal accumulation of fluid in the pleural space¹. Excess fluid results from the disruption of the equilibrium that exists pleural membranes. In terms of anatomy, the pleural space is bordered by parietal and visceral pleura. Parietal cover the inner surface of the thoracic cavity, including the mediastinum, diaphragm and ribs². Visceral pleurae envelop all surfaces of the lungs,

including the interlobar fissures. This lining is absent at the hilus, where pulmonary vessels, bronchi and nerves center the lung tissue. The mediastinum completely separates the right and left pleural spaces³.

Normal pleural fluid has the following characteristics like clear ultrafiltrate of plasma, pH 7.60-7.64, protein content less than 2% (1 to 2 g/dL), fewer than 1000 WBCs per cubic millimeter, glucose content similar to that of plasma, lactate dehydrogenase (LDH) level less

than 50.0% of plasma and sodium and potassium and calcium concentration similar to that of the interstitial fluid⁴⁻⁵. Clinical presentation of pleural effusion varies from asymptomatic to life-threatening symptoms depending upon the volume of effusion and the underlying disease process⁷.

Pleural effusions that affect minimal lung function are well tolerated, whereas similar effusions in patients with underlying severe lung disease may cause ventilatory failures⁸. By taking proper history, performing a physical examination and necessary investigations definitive etiological diagnosis of pleural effusion could be made which would help and influence the effective management of pleural effusion⁹. However, in some cases, the exact cause and clinical significance of pleural effusion is not obvious. The purpose of the present study was to see the demographic characteristics and clinical profiles of patients presented with exudative pleural effusion.

Methodology

Study Settings and Population: This comparative cross-sectional study was carried out at medicine indoor department of Sylhet MAG Osmani Medical College Hospital, Sylhet, Bangladesh over a period of six months from October 2009 to March 2010. Patients who were admitted with pleural effusion were selected as the study population. Patients who were presented with clinically and radiologically detected pleural effusion with exudative pleural effusion were included in this study. Exclusion criteria were transudative pleural effusion, traumatic pleural effusion or haemothorax, effusion due to chest surgery and chylothorax. The variables studied were demographic characteristics like age, sex and clinical presentation.

Study Procedure: Pleural fluid was collected by a physician. The laboratory tests were performed in the Department of Laboratory medicine of the Hospital. Data were collected using a structured questionnaire (research instrument) containing all the key variables.

Statistical Analysis: Statistical analyses were performed with SPSS software, versions 22.0 (IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.). Continuous data were summarized in terms of the mean, standard deviation, median, minimum, maximum and number of observations. Categorical or discrete data were summarized in terms of frequency counts and percentages. For end points analysis, Fisher's exact test was used for categorical variables and an analysis of variance (Student t Test) was applied for continuous outcomes. A two-sided P

value of less than 0.05 was considered to indicate statistical significance.

Results

A total of 50 cases were selected consecutively in the study. Out of 50 patients, 28% was in the range of 41-50 years followed by 26% between 31-40 years. 18% was in the range of 51-60 years and 14% was above 60 years. Very few (2%) were below 20 years of age. The mean age of the patients was 44.5 ± 12.86 years with age range 16 to 70 years (Figure I).

Majority of patients were male. Out of 50 patients, 34 (68%) were male and 16(32%) were female. Male to female ratio was 2.1:1 (Table 1).

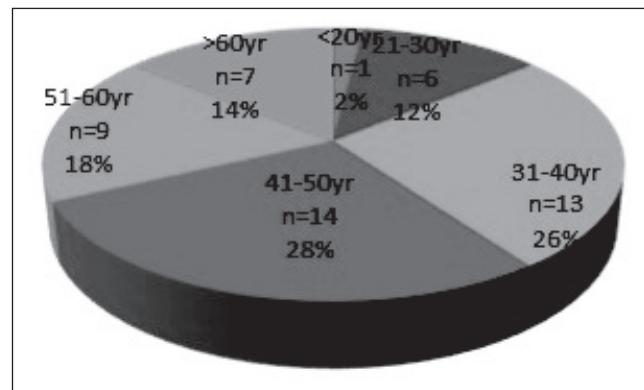


Figure I: showing age distribution of patients having pleural effusion (n=50)

Table 1: Distribution of patients by sex (n=50)

Gender	Frequency	Percent
Male	34	68.0
Female	16	12.0
Total	50	100.0

Figure II had showed the socio-economic status of the patients. Over half of the patients (54.0%) was poor; 32.0% cases was middle class and 14.0% cases was rich.

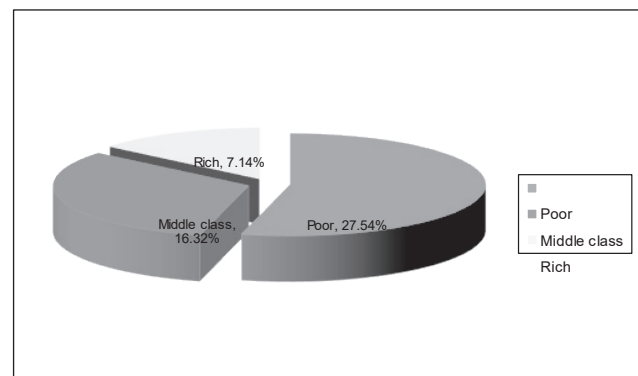


Figure II: showing socio economic status of the patients

Smoking habit of the patients depicted that over three quarter (76%) of the patients was smoker and the remaining (24%) non-smoker (Table 2).

Table 2: Distribution of Patients according to Smoking Habit (n=50)

Smoking Habit	Frequency	Percent
Smoker	38	76.0
Non-Smoker	12	24.0
Total	50	100.0

Low-grade fever (92.0%), cough (86.0%), weight loss (74.0%) and dyspnoea (56.0%) were found as the most common symptoms of exudative pleural effusion. Hoarseness of voice was found in 7 cases of pleural effusion patients (Table 3).

Table 3: Distribution of patients according to Symptoms of Pleural Effusion

Symptoms	Frequency	Percent
Fever	46	92.0
Cough	43	86.0
Sputum	32	64.0
Dyspnoea	28	56.0
Chest pain	30	60.0
Haemoptysis	23	46.0
Weight loss	37	74.0
Hoarseness of voice	7	14.0

Discussion

Tuberculous pleural effusion may also occur when tuberculous cavity in a patient with extensive post primary disease rupture into pleura¹⁰⁻¹¹. This usually causes a tuberculous pyopneumothorax. When the tuberculous material enters the pleural space of an individual who has become hypersensitive to tubercular protein from a previous infection, causes exudative inflammation in the pleura resulting in effusion. Following a peripheral primary infection, the pleural space may be contaminated by organisms that are transported lymphogenously to the pleura and hence across the surface of the lung to the hilum. Classically tuberculous pleurisy with effusion occurs in younger individuals in the absence of pulmonary infection⁹. Although simultaneous pulmonary tuberculosis may be present.

Pleural effusion is a very common problem in our clinical practice¹². Etiological diagnosis is essential for

the proper management of effusion. In this study, 50 cases of exudative pleural effusion were studied prospectively. In this study, among 50 patients 34 were male and 16 were female. This is a quite common picture in hospital admission in our country. The etiology of pleural effusion has been studied extensively at different times. In a series of 97 patients with pleural effusion, Haque et al¹³ found the following final diagnosis.

The mean age of the patients was 44.5 ± 12.86 years and the lowest and highest ages were 16 and 70 years respectively. The majority (68.0%) of the patients were male and 32.0% female giving a male to female ratio roughly of 2.1:1. Vaides et al¹⁴ reported that pleural effusion patients aged 57.1 ± 21.1 years. In this study maximum number of patients belonged to 31 to 60 years of age (72%). Incidence was found lower before 20 years (02%) which is more or less similar to another study in Bangladesh¹⁵. This study indicates that the incidence of malignant pleural effusion is still less common in females than males but the incidence is gradually increasing. This is probably due to less smoking habits of females than male¹⁶.

Over half (54.0%) of the patients were poor, 32.0% middle class and 14.0% rich. Over three-quarters, (76.0%) of the patients were a smoker and the remaining 24.0% were non-smokers. The majority of the patients complained of fever (92.0%), cough (86.0%), weight loss (74.0%), productive sputum (64.0%), chest pain (60.0%), dyspnoea (56%), haemoptysis (32.0%) and hoarseness of voice (12.0%). More than three-quarters (82.0%) of the patients exhibited decreased chest movement and expansion and 64.0% of cases had mediastinal shifting. The chest was stony and dull on percussion (98.0%). twenty percent of the patients exhibited signs of tenderness.

In 74.0% of cases, breath sound was absent and vocal resonance decreased while in 18% of the cases added sound was heard. Around 54.0% of the patients had right-sided pleural effusion, 40.0% left-sided and 6.0% had bilateral. Patchy opacities with cavitary lesions were found in 16.0%, and mass lesion with irregular margin in 14.0% patients.

Valdes et al¹⁴ conducted a study on 120 patients and observed that 64.5% had right-sided pleural effusions, 31.7% had left-sided pleural effusions, while in 3.8% both sides were involved. In another study by Haque et al¹³ right-sided pleural effusions were found to be more common (56.0%). As infections are more common on the right side than on the left, most types of pleural effusions showed a preference for the right side the

right principal bronchus is shorter 1 inch, wider and more in line with the trachea than the left principal bronchus which causes inhaled particles to pass more frequently to the right lung.

Conclusion

In conclusion, middle age adult males living in poor socioeconomic conditions are most commonly suffering from exudative pleural effusion. In light of the findings of the present study and discussion thereof, the following recommendations are put forward. All those interested in pleural diseases should determine the etiologic pattern of exudative pleural effusion using as less invasive diagnostic aids as possible. Further studies are needed to evaluate the utility of the procedures presently being used to come to a diagnosis of pleural effusion.

References

1. Daniil ZD, Zintzaras E, Kiropoulos T, Papaioannou AI, Koutsokera A, Kastanis A, Gourgoulialis KI. Discrimination of exudative pleural effusions based on multiple biological parameters. *European Respiratory Journal*. 2007;30(5):957-64
2. Light RW. Pleural effusion. *New England Journal of Medicine*. 2002 Jun 20;346(25):1971-7
3. Prabhu VG, Narasimhan R. The role of pleuroscopy in undiagnosed exudative pleural effusion. *Lung India: official organ of Indian Chest Society*. 2012;29(2):128
4. Romero-Candeira S, Hernández L, Romero-Brufao S, Orts D, Fernández C, Martín C. Is it meaningful to use biochemical parameters to discriminate between transudative and exudative pleural effusions?. *Chest*. 2002 Nov 1;122(5):1524-9.
5. Light RW. Useful tests on the pleural fluid in the management of patients with pleural effusions. *Current opinion in pulmonary medicine*. 1999;5(4):245.
6. Wilcox ME, Chong CA, Stanbrook MB, Tricco AC, Wong C, Straus SE. Does this patient have an exudative pleural effusion? The rational clinical examination systematic review. *JAMA* 2014;311(23):2422-31.
7. Agarwal R, Aggarwal AN, Gupta D. Diagnostic accuracy and safety of semirigid thoracoscopy in exudative pleural effusions: a meta-analysis. *Chest*. 2013;144(6):1857-67.
8. Light RW. Management of pleural effusions. *Journal of the Formosan Medical Association= Taiwan yi zhi*. 2000 Jul 1;99(7):523-31.
9. Chakrabarti B, Ryland I, Sheard J, Warburton CJ, Earis JE. The role of Abrams percutaneous pleural biopsy in the investigation of exudative pleural effusions. *Chest*. 2006 Jun 1;129(6):1549-55.
10. Na MJ. Diagnostic tools of pleural effusion. *Tuberculosis and respiratory diseases*. 2014 May 29;76(5):199-210.
11. Heffner JE, Sahn SA, Brown LK. Multilevel likelihood ratios for identifying exudative pleural effusions. *Chest*. 2002;121(6):1916-20.
12. Janssen JP, Ramlal S, Mravunac M. The long-term follow up of exudative pleural effusion after nondiagnostic thoracoscopy. *Journal of Bronchology & Interventional Pulmonology*. 2004;11(3):169-74.
13. Haque ME, Ahmad MM, Hiron MM. Aetiological diagnosis of pleural effusion. *Chest & Heart Journal*. 2000;24(1):1-4
14. Valdes L, Alvarez D, Valle JM, Pose A, San José E. The etiology of pleural effusions in an area with high incidence of tuberculosis. *Chest*. 1996;109(1):158-62.
15. Ernam D, Atalay F, Hasanoglu HC, Kaplan Ö. Role of biochemical tests in the diagnosis of exudative pleural effusions. *Clinical biochemistry*. 2005;38(1):19-23.
16. Heffner JE, Brown LK, Barbieri CA, Primary Study Investigators. Diagnostic value of tests that discriminate between exudative and transudative pleural effusions. *Chest*. 1997;111(4):970-80.