



CLINICAL PROFILE OF PATIENTS OF PLEURAL EFFUSION IN A TEACHING HOSPITAL LOCATED IN NORTHERN PART OF INDIA

Internal Medicine

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ABSTRACT

Introduction: Pleural effusion is the excessive buildup of fluid between the two pleural layers, often caused by various pathogenic processes. It can be classified as exudative or transudative based on the characteristics of the fluid. The causes of pleural effusion are diverse, with congestive cardiac failure, pneumonia, malignancy, and tubercular effusion being common etiologies. Prompt diagnosis and treatment are essential to prevent complications. This study aimed to identify the clinical characteristics of pleural effusion patients in teaching hospitals in Northern India.

Objectives: To study the clinical profile of patients with pleural effusion in a teaching hospital in Northern India. **Methods:** A prospective observational study was conducted in the Department of Medicine at Shri Mahant Indresh Hospital, SGRRIM&HS Dehradun. The study included 100 patients diagnosed with pleural effusion. Detailed history, physical examinations, and diagnostic tests were performed, including chest radiography, pleurocentesis, biochemical, cytological, and microbiological investigations. Statistical analysis was conducted using SPSS Version 21.0 and Microsoft Excel 2010. **Results:** The study participants had a mean age of 58.1%, with a slight female predominance (54.0%). Smoking history was reported by 35% of cases, while 13% had a history of tuberculosis (TB) or TB contact. The most common presenting symptoms were cough (78%), weight loss (38%), breathlessness (32%), night sweats (24%), and chest pain (18%). Exudative pleural effusion had significantly higher levels of pleural fluid proteins, LDH, and ADA compared to transudative effusion ($p < 0.01$). **Conclusion:** This study provided insights into the clinical profile and etiological causes of pleural effusion in a teaching hospital in Northern India. The study population had diverse symptoms and underlying etiologies, highlighting the importance of thorough investigation and considering tuberculosis in cases with weight loss and night sweats. A comprehensive cardiac workup is also necessary for cases with vague symptoms.

KEYWORDS

INTRODUCTION

Between the lungs and the chest wall, in the pleural space, there is typically a thin layer of fluid that serves as a coupling system. When pathogenic processes lead to an imbalance of the hydrostatic pressure gradient, capillary membrane permeability, and lymphatic capacity, which results in inadequate protein metabolism or inflammatory exudates, pleural fluid buildup happens [1]. An excessive fluid buildup between the two pleural layers is known as a pleural effusion [2]. It is not a distinct disease but rather a pulmonary or non-pulmonary disease's presentation or complication, and if not treated promptly, it can have serious implications. The list of pleural effusion causes is extremely comprehensive [3].

Based on the characteristics of light, they are widely divided into exudative and transudative effusion [3]. The most frequent cause of transudative pleural effusion worldwide is congestive cardiac failure (CCF) [3]. In the west, pneumonia and malignancy are the most frequent causes of exudative pleural effusions, however in India, tubercular effusion is the most prevalent cause, followed by malignant effusion and a very small number of cases are caused by parapneumonic effusion (PPE) [3,4]. Transudative pleural effusions are quite simple to diagnose because the underlying reasons are readily apparent from the history, physical examination, and a few routine laboratory tests. The majority of exudative pleural effusions, on the other hand, are challenging to diagnose and necessitate a thoracentesis initially, followed by a series of biochemical, cytological, and microbiological investigations. In some instances, it also necessitates the use of specialized diagnostic methods, including computed tomography (CT) scan of the thorax, pleural biopsy, bronchoscopy, and thoracoscopy.

Thus, the purpose of the current study was to identify the clinical characteristics of pleural effusion patients who primarily presented to teaching hospitals in Northern India.

OBJECTIVES

To study the Clinical profile of patients of pleural effusion in a teaching hospital located in Northern part of India.

MATERIAL AND METHODS

Study Area

Department of Medicine, Shri Mahant Indresh Hospital, SGRRIM & HS Dehradun

Study Population Patients diagnosed as having Pleural Effusion, coming to our hospital.

Study Design A Prospective Observational Study

Sample Size Calculation Consecutive type of sampling was followed during study. Study included a total of 100 patients diagnosed as having Pleural Effusion at this tertiary care centre, during study period.

Study Duration July 20 – Dec 21

Inclusion Criteria

1. Patients of both genders and more than 18 years of age with clinical, radiological features of pleural effusion and ultimately confirmed by pleurocentesis.
2. Patients giving valid informed consent.

Exclusion Criteria

1. Patient whose age is less than 18 years.
2. Patients having Haemothorax and chylothorax.
3. Hemodynamically unstable patients.
4. Patients unwilling to give valid consent.

Methodology

The study included 100 participants who were admitted and diagnosed with pleural effusion. A pre-made proforma was used to collect detailed history, perform physical examinations (general, respiratory, and systemic), and record findings. Chest radiography (posteroanterior view) was conducted for all patients, and in some cases, additional views such as lateral and decubitus were taken. Diagnostic pleurocentesis was performed for every patient, and the fluid was subjected to cytological, microbiological, and biochemical tests. Pleural biopsy with an Abram's needle was conducted for specific cases. Blood tests, including hemogram, glucose, LDH, renal and liver function tests, were performed for all patients. Sputum examination for acid-fast bacilli (AFB) staining and culture, as well as HIV status check, were carried out. CT thorax, ultrasound, electrocardiography, and echocardiography were performed when necessary. Thoracoscopy was performed for patients who remained unidentified after thorough evaluation.

Statistical Analysis

The data was collected using a pre-designed study proforma.

Qualitative data was analyzed using frequency and percentage. The association between qualitative variables was assessed using the Chi-Square test with Continuity Correction and Fisher's exact test for 2x2 tables. Quantitative data was represented using Mean $\pm$ SD. Statistical analysis for quantitative data involved the unpaired t-test for normally distributed data and the Mann-Whitney test for non-normally distributed data. A significance level of $p < 0.05$ was considered. Graphical representation was employed when necessary, using SPSS Version 21.0 for most analysis and Microsoft Excel 2010 for creating graphs.

RESULTS

Table 1: Distribution of Baseline Characteristics of study participants

Baseline Characteristics	Mean
Age	58.1%
Female	54.0%
Male	46.0%
Smoking	35.0%
Weight Loss	38.0%
DM	9.0%
TB Contact history	13.0%

Table 2: Distribution of study groups as per co-morbidities/ risk factors

Co-morbidities/ Risk factors	N	%
History of TB	13	13.0%
Smoking	35	35.0%
TB Contact history	13	13.0%
Diabetes	9	9.0%

History of smoking was given by 35% cases while history of TB or TB contact history was given by 13% cases each. (Table 1 and Table 2)

Table 3: Distribution of study groups as per presenting symptoms

Symptoms	N	%
Cough	78	78.0%
Weight Loss	38	38.0%
Breathlessness	32	32.0%
Night Sweats	24	24.0%
Chest Pain	18	18.0%
Fever	2	2.0%
Hemoptysis	1	1.0%

Most common presenting symptom in cases of pleural effusion was cough (78%) followed by weight loss (38%), breathlessness (32%), night sweats (24%) and chest pain (18%). (Table 3)

Table 4: Mean comparison of pleural fluid parameters among exudative and transudative effusion

Pleural fluid Parameters	Exudative		Transudative		p-value
	Mean	SD	Mean	SD	
Pl. Proteins: S. Protein	1.156	0.4152	0.335	0.0813	<0.01
Glucose (mg%)	53.20	20.927	101.50	9.611	<0.01
Pleural fluid Proteins (mg%)	6.175	1.3640	2.280	0.7281	<0.01
LDH (mg%)	1204.76	549.948	607.35	392.051	<0.01
ADA (IU/L)	70.46	97.220	11.15	5.122	<0.01

Mean pleural fluid proteins, LDH and ADA levels were significantly higher in exudative type of pleural effusion as compared to transudative type ($p < 0.01$). (Table 4)

DISCUSSION

Pleural effusion is an excess fluid that accumulates between the two pleural layers [2]. It is not a disease entity but is either a manifestation or a complication of pulmonary or non-pulmonary diseases and can lead to grave consequences if not managed timely.

Mean age of the study subjects with pleural effusion was 58.11 years with 33% cases in the age range of 61 to 80 years and 9% above 80 years of age. Comparable gender distribution was seen among cases with pleural effusion with 54% females to 46% males.

Adeoye et al. [5] study observed the mean age of cases as 38.3 years with 57.7% males to 42.3% females in the study group. The lower age in the study can be attributed to the inclusion of pediatric age group in

this study. Sharma et al. [6] observed that out of 104 patients, male were 75 (72.11%) and female were 29 (28.43%). Patients were between 16 –90 yrs. of age with mean age of 53.4 years. Malikap et al. [7] study observed that among 250 patients of PE, 165 (66%) were male and 85 (34%) were female with male: female ratio of 1.9:1. Mean age of the study group was 51.7 years. Golwalkar JK et al. [8] study observed that pleural effusion was commonly seen in male (73%). The incidence of pleural effusion was maximum in the age group 41-50 years (39%).

Most common presenting symptom in cases of pleural effusion was cough (78%) followed by weight loss (38%), breathlessness (32%), night sweats (24%) and chest pain (18%). Bilateral involvement was seen in 13% cases while right and left side was involved in 61% and 26% cases respectively.

Adeoye et al. [5] study observed that most of the cases presented with difficulty in breathing (50.2%) while 39.4% and 24.9% reported cough and chest pain. Sharma et al. [6] observed that out of 104 patients, pleural Effusion was right sided in 51 patients, left sided in 40 patients and bilateral in 13 patients. Effusion was mild in 58 patients, moderate in 35 patients and massive in 11 patients. Common symptoms observed were: cough (70.2%), chest pain (65.4%), decreased appetite (57.6%), fever (53.8%) and breathlessness (49%). Malikap et al. [7] observed that pleural effusion was more common on the right side (59.6%) in the study. 2% Cases were bilateral. Common symptoms seen in the study cohort were dry cough, breathlessness, fever and chest pain in that order.

Out of the 100 cases of pleural effusion, 80% cases were of exudative type and 20% were of transudative type.

Adeoye et al. [5] study observed the most common cause of PE as TB (32.9%), followed by malignancy (29.1%) and pneumonia (15.0%). CCF was seen in 1.4% cases. Furthermore, 89.1% of the cases had exudative PE. In the study by Sharma et al. [6], majority of patients were having exudative pleural effusion (89 out of 104 cases, 85.57%).

CONCLUSION

Present study aimed to evaluate the clinical profile and various etiological causes of pleural effusion in a teaching hospital located in Northern part of India. Most of the subjects were in their fourth and fifth decade of life with comparable gender distribution while male dominance was observed in tuberculosis cases. Most common presenting complaints were cough followed by breathlessness, weight loss and night sweats. The last two symptoms being pathognomonic for tuberculosis.

Thus, to conclude, cases with pleural effusion can present with varied symptoms and can have different underlying etiologies. The clinician should meticulously investigate every case and should consider for tuberculosis, especially if cases present with weight loss and night sweats. A complete cardiac work up is also required in cases presented with vague symptoms.

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