

Clinico Pathological Correlation in Pleural Effusion

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Abstract: Pleural effusion is excess fluid that accumulates between the two pleural layers, the fluid-filled space that surrounds the lungs. Excessive amounts of such fluid can impair breathing by limiting the expansion of the lungs during ventilation. The objective of this prospective study, carried out at Tirunelveli Medical College Hospital, was to document the clinic pathological correlations in pleural effusion.

Materials And Methods: Medical records of 20 patients with pleural effusion who came to hospital and underwent thoracentesis were collected. The collected pleural fluid was examined under microscope after H&E staining.

Result: Of the 20 cases, 12 were male and 8 were female with the age ranging from 20-65 years. 19 were inflammatory effusion and 1 was non-inflammatory effusion. Of the 19 inflammatory cases 8 were admitted with chief complaint of chest pain, another 8 with dyspnoea, another 2 with hemoptysis and remaining 1 with fever. Cytology of these 19 patients shows inflammatory cells.

Conclusion: This study highlights that Cytology of pleural fluid shows that most of the pleural effusion are inflammatory in origin. Chest pain and dyspnoea are the major symptoms in the patients with inflammatory pleural effusion.

Keywords: Pleural effusion, chest pain, dyspnoea.

I. Introduction

Fluid accumulation in the pleural space indicates pleural effusion. The accumulation is associated with many medical conditions that predispose to fluid accumulation via many different mechanisms, including increased pulmonary capillary pressure, decreased oncotic pressure, increased pleural membrane permeability, and obstruction of lymphatic flow.³

The most common conditions that result in effusions are cardiac failure, pneumonia, and malignant neoplasm. The clinical history and physical examination can be quite helpful in indicating appropriate investigation. Patients with pleural effusions usually have dyspnea, cough, and occasional sharp nonradiating chest pain that is often pleuritic. A history of cardiac, renal or liver impairment can suggest a transudative effusion. A history of cancer can be suggestive of a malignant pleural effusion. Pleural effusion can be exudative or transudative. A pleural effusion with a protein level less than 30 g/L indicates a transudate, whereas one with a level greater than 30 g/L indicates an exudate, provided the serum protein level is within the normal reference range. The most common causes of transudative pleural effusions are

- Left ventricular failure
- Cirrhotic liver disease
- Hypoalbuminemia
- Peritoneal dialysis
- Nephrotic syndrome
- Pulmonary embolism
- Hypothyroidism
- Mitral stenosis
- Constrictive pericarditis
- Meig syndrome
- Urinothorax
- Superior vena cava
- obstruction
- Ovarian hyperstimulation

The most common causes of exudative pleural effusions are

- Malignant neoplasm
- Pulmonary embolism

- Rheumatoid arthritis
- Benign effusion associated
- with exposure to asbestos
- Pancreatitis
- After myocardial infarction
- syndrome
- Autoimmune diseases
- After coronary artery bypass
- surgery
- Subphrenic, hepatic, or
- splenic abscess
- Uremia
- Chylothorax

II. Material and Methods

Pleural fluid collected from the patient is the main sample used for analysis collected by thoracentesis method. Thoracentesis or pleural tap is an invasive procedure to remove fluid or air for diagnostic or therapeutic purposes. The fluid obtained is centrifuged and the supernatant fluid is discarded. The cyto centrifuged sample is treated with H&E staining and viewed under the microscope.

III. Results

Out of 20 patients 19 patients had inflammatory pleural effusion and only one with non inflammatory type. The male (12) : female(8) ratio is 1.5[Table 1.1]. There were no significant differences between gender but however males had an increased incidence of pleural effusion.

1 was in the age group of 1-20 years, 6 were in the age group of 20-40 years, 12 were in the age group of 40-60 years and only 1 was above 60 years [Table 1.2].

The presenting signs and symptoms as chest pain was seen in 8 patients, dyspnea in 8 patients and hemoptysis in 2 patients [Table 1.3]. The cytology showed inflammatory cells in all the 19 patients .Another one patient was admitted with the complaint of fever. Those patients with inflammatory effusion showed the symptoms of chest pain and dyspnea. In the present study, 17 patients respectively had predominant lymphocytes in their pleural fluid

IV. Discussion

The findings are consistent with Sibley. In our series, most of the patients came with chest pain (86.8%), dyspnea (81.6%), and fever (68.4%). Other symptoms like loss of appetite (60.5%), cough (44.7%), and weight loss (34.2%) were less in frequency. The frequency of different symptoms in this study was more or less similar to the findings of Bhadada. He found that the most common symptoms in cases of pleural effusion were chest pain (60%), dyspnea (73%), fever (76.6%), and cough (70%). The increased respiratory rate was not proportional to the degree of pleural effusion, though all of the cases with massive pleural effusion had increased respiratory rates. The increased respiratory rate was not proportional to the degree of pleural effusion, though all of the cases with massive pleural effusion had increased respiratory rates.

Majority of the patients in our study were aged **50** years or more although other studies presented a different picture. This difference may be related to the fact that the most of the pleural effusions in older age group are difficult to diagnose or remain undiagnosed in a primary or secondary health center. In this study 4 cases are histopathologically proven tubercular pleural effusion cases presented with chest pain, dry cough, breathlessness and fever which correlates well with the study of *Chernow B who* observed breathlessness as the commonest symptom in cases of malignant pleural effusion but the present study reveals both chest pain and dyspnea to be the commonest symptoms followed by hemoptysis. Yam has shown that predominant lymphocytes in pleural fluid are suggestive of either tuberculosis or malignancy in the majority of cases. In the present study, 17 patients respectively had predominant lymphocytes in their pleural fluid. Morrone N and Algranti F. performed pleural biopsy in 55 cases of pleural effusion and they found 43.6% cases were due to tuberculosis. In a study from India, it was found that of the 50 patients of pleural effusion, 19(38%) were diagnosed as tuberculosis by pleural biopsy.¹ Mungal *et al.* performed his study on 55 cases of which malignancy was proved histopathologically in 47.3% cases. In another study, pleural biopsy established the etiology of pleural effusion as tuberculosis and malignancy in 31, 1 and 22.4% of cases respectively.

All the cases in this study had predominantly lymphocytic pleural effusion, and 89.5% of them had lymphocyte more than 75% in their pleural fluid. According to Light, in tubercular pleural effusion, the pleural fluid lymphocyte is usually more than 50%. Occasional mesothelial cells were found in 28.9% of cases, and in

no case, it was more than 3%. So, in pleural effusion, mesothelial cells of more than 5% strongly argue against a tubercular etiology. In addition to managing dyspnea and pain with opioids, physical drainage of the fluid may relieve symptoms quickly. For fluid that reaccumulates, pleurodesis may prevent the effusion from recurring. A semi permanent catheter may be placed for frequent drainage in cases where pleurodesis is not possible. Auscultation of the lungs reveals absent breath sounds in the area of the effusion and percussion over the area of involvement is dull. Using percussion, a line can often be drawn between the fluid level and aerated lung showing the size of the effusion. Pulsoximetry may be normal or low dependent on the size of the effusion and the amount of normal lung tissue present. If the pleural effusion is associated with cardiac disease, other signs of excess fluid should be present such as lower extremity edema or tachycardia. If associated with liver disease, there should be other signs of disease such as ascites or varicies (telangectasia)

V. Conclusion

In our study, the following points are highlighted

1. Chest pain and dyspnoea are the main symptoms of pleural effusion.
2. Cytology of pleural fluid shows that most of the pleural effusion are inflammatory in origin
3. Those patients with inflammatory pleural effusion presented with complaints of chest pain and dyspnoea.

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Table 1.1

| SYMPTOMS | NO. OF CASES | MALE | FEMALE |
|------------|--------------|------|--------|
| Chest pain | 8 | 6 | 2 |
| Dyspnoea | 8 | 5 | 3 |
| Hemoptysis | 2 | 1 | 1 |

Table 1.2

| AGE RANGE | NO. OF CASES |
|-------------|--------------|
| 0-20 years | 1 |
| 20-40 years | 6 |
| 40-60 years | 12 |
| >60 years | 1 |

Table 1.3

| TYPES OF EFFUSION | NO. OF CASES | MALE | FEMALE |
|-------------------|--------------|------|--------|
| Inflammatory | 19 | 11 | 8 |
| Non- inflammatory | 1 | 1 | - |