INTRODUCTION
Pleural effusion is an abnormal accumulation of fluid in the Pleural space. The pleural space lies between the lung and chest wall and normally contains a very thin layer of fluid, which serves as a coupling system. Excess fluid results from the disruption of the equilibrium that exists across pleural membranes. Pleural effusion is an indicator of a pathologic process that may be of primary pulmonary origin or of an origin related to another organ system or occasionally the first evidence of some other systemic disease.

It may occur in the setting of acute or chronic disease and is not a diagnosis in itself. The occurrence of pleural effusion [PE] is a common finding, with higher incidence of effusions secondary to non infective pathology in the western studies and infective pathology in India. Diagnosing the etiology of pleural effusions clinically with certainty is a challenging task for physicians.

The advancements in the field of medicine and with the advent of various diagnostic aids like pleural fluid analysis, pleural fluid cytology, pleural biopsy, ultrasonography, bronchoscopy, thoracoscopy, serological tests like Antinuclear antibody, ADA, Rheumatoid factor, CT thorax help the physician to arrive at the diagnosis at an earlier course of the disease.

Determining the aetiological & clinical profile of PE helps in adoption of regionally optimized diagnosis & therapeutic approach.

AIMS OF STUDY
• To study about the clinical presentation of various causes of pleural effusion.
• To evaluate the cytological profile of pleural effusion.

MATERIALS AND METHODS
• SAMPLE SIZE: 100 Patients of pleural effusion.
• STUDY DESIGN: Cross-sectional study

INCLUSION CRITERIA:
1) Any case of Pleural effusion.
2) Age 18-85 years.

EXCLUSION CRITERIA:
a) Age < 18 years.
b) Hemodynamically unstable patients.
c) Pregnant women.
d) Patients with bleeding disorders or diathesis.
2. Presenting symptoms:
Patients with tubercular effusion presented with cough as the predominant symptom (91.6%) more of dry cough (73.3%) than cough with expectoration (18.3%) followed by fever (70%), breathlessness (66.7%), chest pain (35%) and hemoptysis (1.7%).

In empyema patients cough was the predominant symptom (83.3%), followed by chest pain (75%), fever (66.7%), breathlessness (58.3%) and hemoptysis (8.3%).

Parapneumonic effusion cough (100%) followed by fever (90.9%) and in transudative effusion cough (100%) and breathlessness (100%) were major symptoms respectively.

In malignant pleural effusion cough (100%) and breathlessness (100%) followed by chest pain (28.6%) and fever (14.3%) respectively were the presenting symptoms.

3. Pleural fluid appearance:
Majority of the effusions were straw colored especially tubercular (88.3%) and transudative effusion (80%). Hemorrhagic effusions were seen most commonly in malignant pleural effusions (100%). Parapneumonic effusion were associated with turbid (90.9%) and all patients with pus (100%) were characterised as Empyema.
6. Pleural Fluid cytology in Malignant pleural effusion:
Among 7 patients of malignant pleural effusion, 4 cases were due to carcinoma lung (57.1%) of which 2 cases were adenocarcinoma and other 2 was due to squamous cell carcinoma. Out of remaining 3 cases, 1 case each was due to carcinoma cervix (14.3%), carcinoma ovary (14.3%) and carcinoma breast (14.3%) respectively.

Table 7: Etiology of Malignant effusion

<table>
<thead>
<tr>
<th>Etiology</th>
<th>No. of cases</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Carcinoma Lung</td>
<td>4</td>
<td>57.1</td>
</tr>
<tr>
<td>Carcinoma cervix</td>
<td>1</td>
<td>14.3</td>
</tr>
<tr>
<td>Carcinoma ovary</td>
<td>1</td>
<td>14.3</td>
</tr>
<tr>
<td>Carcinoma breast</td>
<td>1</td>
<td>14.3</td>
</tr>
</tbody>
</table>

Among the patients with malignant pleural effusions diagnosed, 85.7% had positive malignant cytology and 14.3% had negative malignant cytology in pleural fluid.

Table 8: Malignant cytology

<table>
<thead>
<tr>
<th>Malignant cytology</th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>Percentage</td>
<td>No.</td>
</tr>
<tr>
<td>6</td>
<td>85.7%</td>
<td>1</td>
</tr>
</tbody>
</table>

In carcinoma lung patient where pleural fluid malignant cytology was negative it was further investigated for sputum malignant cytology (which was negative in that patient) and further subjected to Bronchoalveolar lavage (BAL) fluid / endobronchial biopsy which was positive for malignant cells. Thus signifying the importance of role of BAL fluid / endobronchial biopsy in patients with negative malignant cytology.

DISCUSSION

SYMPTOMATOLOGY
The most common symptom encountered by TB patients were dry cough (73.3%), followed by fever (70%), breathlessness (66.7%) and chest pain (35%) in comparison with the study done earlier by Arun Gopi et al54 in which most common symptom were chest pain (75%) and dry cough (70%).

Patients with malignant effusion had cough (100%) and dyspnea (100%) as predominant symptoms followed by chest pain (28.6%) which was similar to a study by Chernov B et al.55 where breathlessness (57%) and cough (43%) are predominant symptoms.

APPEARANCE OF PLEURAL FLUID:
The majority of effusions were straw colored (61%) in which TB effusion was the most common cause (88.3%), hemorrhagic effusions were encountered predominantly in malignant effusions (100%), Parapneumonic effusion cough (100%) followed by fever (90.9%) were the predominant symptoms. Most of the patients with synpneumonic effusion, had complaints of a short duration with an acute onset, whereas those with tuberculous effusion and malignancy had complaints of a longer duration.

Among the transudative pleural effusion, Congestive heart failure was the most common cause in our study. Cough (100%) and breathlessness (100%) were major symptoms respectively which was nearly consistent with the Lights description of Congestive heart failure.

PLEURAL FLUID CELL TYPE AND CELL COUNT:
The majority of effusions had total leukocyte count less than 1000 cells/mm³ of which Tuberculosis constitutes 50%. All patients of empyema had cell count greater than 5,000/mm³ (100%) followed by parapneumonic effusions (36.4%) consistent with Light’s observation et al. The low cell counts in tuberculous pleural effusion compared to empyema and parapneumonic effusion may be due to cell mediated immunity, lymphocyte predominance in tuberculous effusion whereas antibody mediated immunity and neutrophil predominance in empyema and parapneumonic effusion. 83.3% of TB effusions and 100% of malignant effusions had lymphocyte predominance. In comparison to other studies Valdes L et al77 where they have encountered neutrophil predominant tuberculous effusion in only 6.7% of patients and only one malignant effusion had neutrophil predominant effusion(3%). Folland11 demonstrated predominance of lymphocytes and scarcity of mesothelial cells in tubercular effusion; Light RW12 – large number of neutrophils indicate the presence of bacterial pneumonia. Lymphocytes predominant in tubercular pleural effusion.
Table 12: cell cytology in our study and other reference studies

<table>
<thead>
<tr>
<th>Studies</th>
<th>Predominant cells</th>
<th>Etiology of effusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our study</td>
<td>Lymphocytes</td>
<td>83.3% of TB effusion 100% of malignant effusion</td>
</tr>
<tr>
<td>Valades et al</td>
<td>Lymphocytes</td>
<td>93.3% of TB effusion 97% of malignant effusion</td>
</tr>
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</table>

**SUMMARY AND CONCLUSIONS**

- Tubercular effusion affects most commonly young and is associated with cough and fever as the most common presenting symptom.
- Malignant effusions were seen in older age group with cough and dyspnoea as predominant symptoms.
- Massive effusion with hemorrhagic pleural fluid is commonly associated with malignant effusion, while small to moderate effusions with straw colour pleural fluid is associated with Tubercular effusion whereas empyema cases presented with pus.
- Empyema was most commonly associated with high Leukocytes.
- Tubercular effusion was associated with lymphocytic predominant effusion whereas neutrophilic dominant effusion included empyema and parapneumonic effusion.

**REFERENCES**

2. Etiological distribution of pleural effusions in rural hospital. Department of Medicine, Malhatma Gandhi Institute of Medical Sciences. The Indian Practitioner. 1998 Jul; 51(7):517-21.