



## A CLINICOLABORATORY STUDY OF CASES OF PLEURAL EFFUSION (A STUDY OF 75 CASES)

### Medicine

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### ABSTRACT

Abnormal collection of fluid in pleural cavity is known as pleural effusion . it is a syndrome of clinical signs and symptoms with varying etiologies, most common being koch's and malignant effusion. The main focus of disease is commonly in pleura and lungs but it can be extra-pulmonary as well as systemic disorder most common it is Rheumatoid Arthritis. So it is necessary in today's life to know about it. Because it can present to anybody from physician to surgeon.

### KEYWORDS

Breathlessness, Tuberculosis, Polyserositis, Carcinoma Bronchus.

### INTRODUCTION

Abnormal collection of fluid in pleural cavity is known as pleural effusion . it is a syndrome of clinical signs and symptoms with varying etiologies, most common being koch's and malignant effusion. In india tuberculosis is the major health problem. It is the most common cause of pleural effusion followed by malignancy. About 5% of the patient have more than one cause for pleural effusion. In this study, attempt was put to etiologic diagnosis of pleural effusion and particular emphasis was put on ADA estimation as a marker diagnosis tuberculous pleural effusion.

### AIMS & OBJECTIVES

1. To study incidence, age and sex distribution of pleural effusion in indian population.
2. To study the clinical profile of pleural effusion.
3. To study the physical, biochemical, enzymatic and cytological parameters for classification and disease specific diagnosis.
4. To study the complication of pleural effusion and pleural tapping

### MATERIALS AND METHODS

In this study total 75 adult patients of both sex were randomly taken from patients admitted in Guru Gobind Singh hospital and TB and Chest diseases Hospital, Medical wards or coming to O.P.D.

### INCLUSION CRITERIA:

Patients with pleural effusion as determined by clinical and/or radiological means, thoracentesis on whom could yield a minimum amount of fluid enough to carry out routine tests were included in the study.

### EXCLUSION CRITERIA:

Patients with pleural effusion with non-aspirable fluid quantity decided clinically and radios logically, were excluded.

All patients underwent detailed clinical examination and routine laboratory examination like Urine, examination blood tests like total WBC count, differential WBC count, hemoglobin, erythrocyte Sedimentation rate, sputum examination for acid fast bacilli was carried out in all patents.

A plain x-ray of the postero-anterior view of the chest was obtained prior to thoracentesis and another was taken after thoracentesis torule out complication. Additional films, fluoroscopy and ultrasonography were done when ever indicated.

Pleural fluid analysis was done for protein, sugar, total cell count, differential cell count, gram stain for bacteria, Ziehl Nelson staining and cytology.

Pleural fluid with protein > 3gm% was considered as exudative

effusion and <- 3 gm % was considered as transudative effusion. Diagnosis was made on basis of clinical examination and analysis of laboratory data.

### RESULT

The present study was carried out in the department of medicine consisting of 75 cases of pleural effusion admitted during June 201 5 to December 201 7 in our tertiary care hospital.

### Etiological Diagnosis

| Diagnosis                        | No. of cases (out of 75) | %   |
|----------------------------------|--------------------------|-----|
| Tuberculosis                     | 44                       | 58  |
| Malignancy                       | 1 2                      | 1 6 |
| Para pneumonic                   | 8                        | 1 0 |
| Congestive cardiac failure (CCF) | 5                        | 7   |
| Cirrhosis                        | 2                        | 3   |
| Nutritional Hypoproteinemia      | 2                        | 3   |
| Acute Renal Failure (ARF)        | 2                        | 3   |

### Correlation of associated illness with diagnosis

| Diagnosis          | Diabetes | IHD | Asthma | COPD |
|--------------------|----------|-----|--------|------|
| TB(44)             | 3        | 0   | 0      | 1    |
| Malignancy (1 2)   | 1        | 1   | 0      | 0    |
| Para pneumonic(8)  | 0        | 0   | 1      | 0    |
| CCF (5)            | 1        | 2   | 0      | 0    |
| Cirrhosis(2)       | 0        | 0   | 0      | 0    |
| Hypoproteinemia(2) | 0        | 0   | 0      | 0    |
| ARF(2)             | 0        | 0   | 0      | 0    |
| Total              | 5        | 3   | 1      | 1    |

### Classification into transudates and exudates according to clinical and fluid analysis

| Diagnosis                   | Transudate | Exudate |
|-----------------------------|------------|---------|
| Tuberculosis                | 2          | 42      |
| Malignancy                  | 2          | 1 0     |
| Para Pneumonic              | 0          | 8       |
| CCF                         | 5          | 0       |
| Cirrhosis                   | 2          | 0       |
| Nutritional hypoproteinemia | 2          | 0       |
| Acute Renal Failure         | 1          | 1       |
| Total(75)                   | 1 4        | 61      |
| Percentage%                 | 1 9%       | 81 %    |

### DISCUSSION

The observation made on 75 cases of pleural effusion admitted to the Department of medicine, Shri M.P. Shah Medical College Jamnagar between October 2016 to October 2017 are discussed and result obtained are compared with study.

**Comparison of Etiological diagnosis of pleural effusion**

| Diagnosis       | Valdes <sup>1</sup> | A D ambal <sup>2</sup><br>(1998) | S. kava <sup>3</sup> (2000) | J.E. Heffner <sup>4</sup> (2002) | J.E. Heffner <sup>5</sup> (2003) | Bhavsar <sup>6</sup> (2015) | Raja rao <sup>7</sup> (2016) | Present study (2017) |
|-----------------|---------------------|----------------------------------|-----------------------------|----------------------------------|----------------------------------|-----------------------------|------------------------------|----------------------|
| Tuberculosis    | 25%                 | 65%                              | 80%                         | 20%                              | 66%                              | 60%                         | 58%                          |                      |
| Malignancy      | 23%                 | 18%                              | 4%                          | 30%                              | 32.4%                            | 18%                         | 15%                          | 16%                  |
| parapneumonic   | 13%                 | 18%                              | 4%                          | 12%                              | 13.9%                            | 10%                         | 8.3%                         | 10%                  |
| CCF             | 22%                 | 18%                              | 8%                          | 18%                              | 5%                               | 2%                          | 7%                           |                      |
| Cirrhosis       | 1%                  | 3.6%                             | 2%                          | 3%                               | 2.8%                             | 3%                          |                              |                      |
| hypoproteinemia | 1%                  | 2%                               | 1.7%                        | 1.6%                             | 4%                               | 3%                          |                              |                      |
| ARF             | 1.8%                | 3%                               |                             |                                  |                                  |                             |                              |                      |

**Incidence of various symptoms in tuberculous effusion**

| Authors                       | No of pt | Cough   | Chest pain | dyspnea   | Fever     |
|-------------------------------|----------|---------|------------|-----------|-----------|
| Berger HW <sup>8</sup> (1937) | 23       | 46(93%) | 38(77%)    | 42(85.7%) |           |
| Adambal <sup>2</sup> (1998)   | 36       | 35(97%) | 24(66%)    | 23(91%)   | 33(91%)   |
| Shah <sup>9</sup> (2006)      | 54       | 47(47%) | 35(64%)    | 33(61%)   | 30(55.5%) |
| Present study (2017)          | 75       | 38(86%) | 26(59%)    | 28(64%)   | 24(54%)   |

**Additional parenchymal lesion on X ray chest**

| Study                             | Patient with parenchymal lesion |
|-----------------------------------|---------------------------------|
| Richard shaw <sup>10</sup> (1961) | 26(43.3%)                       |
| Burgess <sup>11</sup> (1973)      | 12(24.5%)                       |
| Carmen S.V <sup>12</sup> (1987)   | 7(30.44%)                       |
| K.N.Ram <sup>13</sup> (1995)      | 16(21%)                         |
| S.Kava <sup>3</sup> (2000)        | 11(28%)                         |

**ADA level in the tuberculous and non tuberculous pleural effusion**

| Study                                  | Tuberculous (mean±SD) | Non tuberculous (mean±SD) |
|--|-----------------------|---------------------------|
| Baldev raj <sup>14</sup> (1985)        | 99.56±9.78            |                           |
| Chopra RK <sup>14</sup> (1989)         | 114.2±7.22            |                           |
| E Peraz Rodriguez <sup>15</sup> (1999) | 54.7±23.5             | 18.3±43.2                 |
| S.K.Sharma <sup>16</sup> & co(2001)    | 95.8±57.5             | 30.7±25.42                |
| Shah <sup>17</sup> (2006)              | 105.12±57.06          | 21.24±25.42               |
| Present study(2017)                    | 105.6±30.8            | 14.13±8.43                |

**CONCLUSION**

Tuberculosis was the most common cause of pleural effusion with higher incidence in younger age group (below 40 years) and subacute onset of symptoms followed by malignancy with higher incidence in older age group (above 50 years) with male predominance in both groups. CCF was commonest cause of transudative pleural effusion.

- Cough was the commonest symptom while reduced movement of chest with respiration, dull note on percussion and diminished air entry on auscultation were the commonest clinical signs of pleural effusion. Presence of fever indicative of infective etiology (tuberculosis, para-pneumonic).
- Right sided pleural effusion was more common in tuberculous, malignant, para-pneumonic, due to cirrhosis, while bilateral pleural effusion was more common in patients with CCF and hypoproteinemia. In appropriate clinical setting for bilateral pleural effusion underlying cardiac dysfunction is highly probable.
- Majority of the patients with malignant pleural effusion had large, hemorrhagic fluid while tuberculous pleural effusion had small to moderate, yellowish fluid. Large, hemorrhagic fluid is suspicious of malignancy.
- Mediastinal shift should be thoroughly searched for central bronchogenic carcinoma.
- Most common cause of encysted pleural effusion was tuberculosis followed by para-pneumonic. In patients with encysted effusion one should consider for tuberculous etiology.
- Pleural effusion due to CCF, cirrhosis, ARF, hypoproteinemia had clear fluid. Patients with clear transudative pleural fluid should be considered for non-infectious and non-malignant etiology such as CCF, cirrhosis etc.
- PF-ADA > 40IU/L was present in tuberculous pleural effusion and occasionally in complicated para-pneumonic effusion, while it was < 40IU/L in non-tuberculous pleural effusion. So, pleural fluid ADA at 40 IU/L cut off level can serve as distinctive parameters for separation of tuberculous and non-tuberculous effusion.
- Majority of patients with tuberculous and malignant effusion had

total WBC count < 1000/cmm with predominant lymphocytes while majority of the patients with para-pneumonic effusion had total WBC count > 1000/cmm with predominant polymorphs. So pleural fluid having WBC count > 1000/cmm with predominant polymorphs should arouse suspicion of para-pneumonic effusion.

- Pleural fluid was positive for AFB in insignificant number of patients with tuberculous effusion. So, negative pleural fluid for AFB can not rule out possibility of tuberculous etiology.
- Pleural fluid cytology positive for malignant cells was present in significant number of patients with hemorrhagic effusion. Pleural fluid cytology for malignant cells can help in categorization of pleural effusion into specific diagnostic group.
- Post thoracocentesis pneumothorax complication was occasional and no one had required any treatment for that. With highest technical care and clinic-radiological guidance, thoracocentesis is a safe ward procedure.

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