



## A CASE STUDY OF ETIOLOGICAL PROFILE OF PLEURAL EFFUSION AND DIAGNOSTIC EFFICACY OF PLEURAL FLUID ANALYSIS

**KEYWORDS**

perception, OPD attendees, primary health centres

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**ABSTRACT**

To study about the etiological profile of pleural effusion in patients admitted in our hospital. To evaluate the reliability and diagnostic efficacy of pleural fluid glucose, Lactate dehydrogenase and Adenosine deaminase estimation in diagnosis of pleural effusion.

**Sample Size:** 100 Patients of pleural effusion.

**INCLUSION CRITERIA:**

1. Any case of Pleural effusion.
2. Age 18-85 years.

**EXCLUSION CRITERIA:**

1. Age < 18 years.
2. Hemodynamically unstable patients.
3. Pregnant women.
4. Patients with bleeding disorders or diathesis.

**RESULTS:**

**1. Etiology**

In this study patients with pleural effusion were classified as transudative and exudative pleural effusion based on Lights criteria. These were further classified based on etiology and clinical profile as,

**• Transudative pleural effusions:**

Among transudative pleural effusion majority were due to CCF (80%), followed by effusion due to Renal failure (20%).

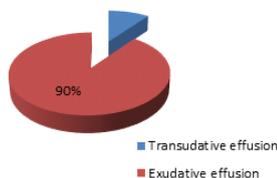
**• Exudative pleural effusions:**

The majority were tubercular in origin (66.7%), followed by empyema (13.3%), parapneumonic effusion (12.2%) and malignant effusion (7.8%).

**• Table - 1 :Classification of transudative and exudative pleural effusion**

Etiology	No. of cases (n=100)	Percentage
Transudative effusion	10	10
Exudative effusion	90	90
Total	100	100

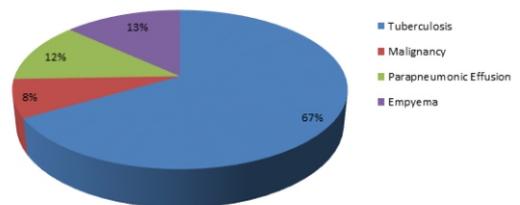
**Graph -1 : Classification of Transudative and Exudative Pleural Effusion**



**Table 2 -Etiological Classification of Exudative Effusion.**

Etiology	No. of cases ( n = 90)	Percentage
Tuberculosis	60	66.7
Malignancy	7	7.8
Parapneumonic Effusion	11	12.2
Empyema	12	13.3
Total	90	100

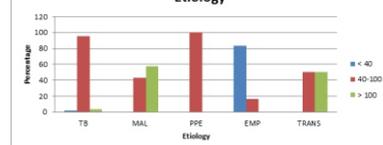
**Graph 2 :-Etiological Classification of Exudative Effusion**



**Table 3: Pleural fluid Glucose levels and Etiology**

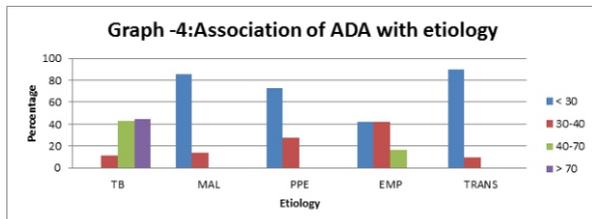
Pleural fluid glucose	Etiology					Total
	TB	MAL	PPE	EMP	TRANS	
<40	1(1.7%)	0	0	10(83.3%)	0	11
40-100	57(95%)	3(42.9%)	11(100%)	2(16.7%)	5(50%)	78
>100	2(3.3%)	4(57.1%)	0	0	5(50%)	11
Total	60(100%)	7(100%)	11(100%)	12(100%)	10(100%)	100

**Graph -3:Pleural fluid Glucose levels and Etiology**



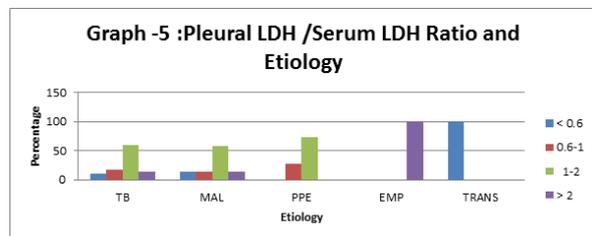
**Table 4: Association of ADA with Etiology**

ADA	Etiology				
	Exudate				
	TB	MAL	PPE	EMP	TRANS
< 30	0	6(85.7%)	8(72.7%)	5(41.7%)	9(90%)
30-40	7(11.7%)	1(14.3%)	3(27.3%)	5(41.7%)	1(10%)
40-70	26(43.3%)	0	0	2(16.6%)	0
> 70	27(45%)	0	0	0	0
Total	60(100%)	7(100%)	11(100%)	12(100%)	10(100%)



**Table 5: Pleural LDH / Serum LDH ratio and Etiology**

Pl.LDH/Sr.LDH	Etiology					Total
	Exudate					
	TB	MAL	PPE	EMP	TRANS	
<0.6	6(10%)	1(14.3%)	0	0	10(100%)	17
0.6-1	10(16.7%)	1(14.3%)	3(27.3%)	0	0	14
1-2	36(60%)	4(57.1%)	8(72.7%)	0	0	48
>2	8(13.3%)	1(14.3%)	0	12(100%)	0	21



**DISCUSSION  
ETIOLOGY**

Out of the 100 cases of pleural effusion, 60 cases were of tuberculous effusion(60%). This was similar to the observation in another study from India by Maldhureet al<sup>53</sup> where they showed that the tuberculous effusions constitute 66% of the effusions. General prevalence of TB is high in India and Southeast Asian countries than in the West. In India tuberculous effusion is the commonest cause of all exudative effusions. This observation is different from the Western studies, where the incidence of parapneumonic effusion and malignant effusion are much higher compared to tuberculous effusion.

In comparison with some of the previous studies are: Prabhudesai et al<sup>38</sup>-tuberculous effusion comprises 22.4% and 64% were of malignancy

**Table 6: Etiology of pleural effusion in our study and other reference studies**

Studies	Common etiology
Our study	Tuberculosis -60% Empyema -12%
Maldhure et al <sup>53</sup>	Tuberculosis -66.4% Malignancy -15.2%
Prabhudesai et al 38	Malignancy -64% Tuberculosis -22.4%

**PLEURAL FLUID GLUCOSE:**

The majority of pleural fluid glucose levels were between 40-100mg/dl in tuberculous effusions (95%) while only 1.7% of tuberculosis effusions had sugars less than 40mg/dl..

**ADENOSINE DEAMINASE:**

In tuberculous pleural effusion pleural fluid Adenosine deaminase level (ADA) has got a good diagnostic index after excluding other causes of raised ADA levels. Although a pleural fluid ADA above 70IU/L is diagnostic of tuberculosis<sup>57</sup>, it has to be considered if the pleural fluid ADA is between 40 IU/L and 70 IU/L. An ADA level less than 40IU/L very much unlikely of pleural tuberculosis.

**Table 7: Utility of ADA in Tuberculous pleural effusion with cut off 40IU/L in our study and other reference studies**

Our study	Asmita A. Mehta et al <sup>45</sup> (Reference study)
Sensitivity -96.36%	Sensitivity-85.7%
Specificity -84.4%	Specificity-80.8%
Positive predictive value - 80.3%	Positive predictive value -75%
Negative predictive value - 95%	Negative predictive value - 89.5%

**Table 8: Pleural fluid ADA levels in different etiologies in our study**

Etiology	No. of cases	ADA activity(IU/L) (X+SD)
Tuberculosis	60	69.7+23.78
Malignancy	7	23.5+7.06
Parapneumonic effusion	11	28.6+3.77
Empyema	12	34.4+12.01
Transudate	10	20.3+7.11
Total	100	52.82+28.45

**Pleural LDH to serum LDH ratio:**

The ratio of pleural fluid LDH to serum LDH was more than 2 in 100%, 13.3% and 14.3% of patients with empyema, tuberculous effusion and malignancy respectively.

**Table 9: Pleural fluid mean LDH levels in different etiologies in our study**

Etiology	No. of cases	LDH(X+SD)
Tuberculosis	60	407.06±165.03
Malignancy	7	381.71±165.4
Parapneumonic effusion	11	359.9±69.98
Empyema	12	879±120.42
Transudates	10	178.6±32.92

**SUMMARY AND CONCLUSIONS**

- In our study, Exudative effusion remains most common cause of pleural effusion. Tuberculous effusion remains the commonest etiology of all exudative effusions, where as Congestive cardiac failure remains commonest cause among transudative effusions.
- Pleural fluid, with low glucose (<40 mg/dl) was seen predominantly in empyema.
- Pleural LDH to serum LDH ratio >2 was seen predominantly in empyema.
- Pleural fluid ADA more than 70 IU/L was associated with nearly half of Tuberculous effusions, where as others with ADA levels between 30 to 70 IU/L along with clinicoradiological findings suggestive of tuberculous effusion. Thus proving diagnostic importance of ADA in TB effusions.

- Early initiation of antitubercular drugs in TB pleural effusion, early intervention and treatment in cases of empyema and parapneumonic effusion showed improvement and signs of recovery.

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