Research Paper

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Diagnostic Value of Pleural Fluid Examination

Pathology

KEYWORDS : Pleural fluid, Cytology, Cell count

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ABSTRACT

Introduction:Both malignant and non malignant causes of effusion can be identified by relatively non invasive technique of pleural fluid cytology and cell count. Cytological study of the fluid is important because the cell population present is representative of a much larger surface Are than obtained by needle biopsy.Aims and Objective:

- *To identify various causes of pleural effusion and their incidence in India.*
- *To determine the role of cytological examination of pleural fluid in diagnosis of malignant Effusion.*

Materials and Method: A study of 103 samples was carried out in our tertiary care teaching hospital, Ahmedabad. Samples received during june 2014 to September 2014 were examined for total count and cytology. They were also subjected to biochemical study for protein, glucose, and chloride.

Results: A total 82% samples were exudative and 18% were transudative.Total leucocyte count was less than 1000cells/cumm in most (88.89%)% of transudative effusions and it was greater than 1000cells/cu.mm in 52.44% of exudative effusions.Most of the transudative effusions were secondary to cirrhosis and congestive cardiac failure.The most frequent cause of exudative effusion was tuberculosis (55.11%) followed by malignancy (28.68%), Empyema(8.89%), And pneumonia (7.32%).It was noted that 94.66% of tuberculosis effusions and more than 50% lymphocytes, 70.2% had protein greater than 5 gm/dl and 89.63% had glucose 60 mg/dl.

Approximately 18 % of pleural effusions were positive for malignant cells.Most (89%) of malignant effusions were exudative.

Conclusion: Pleural fluid cytology and cell count are important for knowing etiology of effusion.As compared to biopsy pleural fluid cytology is simple and relatively noninvasive technique for differentiating benign from malignant effusion.

Introduction:

- Aspiration of pleural cavity is a simple and relatively non-invasive technique to achieve a diagnosis. In most diseases related to pleural effusion , the fluid analysis yields important diagnostic information .In certain cases , fluid analysis alone is enough for diagnosis.
- Pleural fluid analysis assists the clinician in formulating, in order of priority a list of differential diagnoses. Pleural fluid also allows one to follow the result of therapy.
- The diagnostic performance of the cytological study of the pleural fluid may be attributable to the fact that the cell population present in sediment is representative of a much larger surface area than that obtained by needle biopsy.

Aims and Objectives:

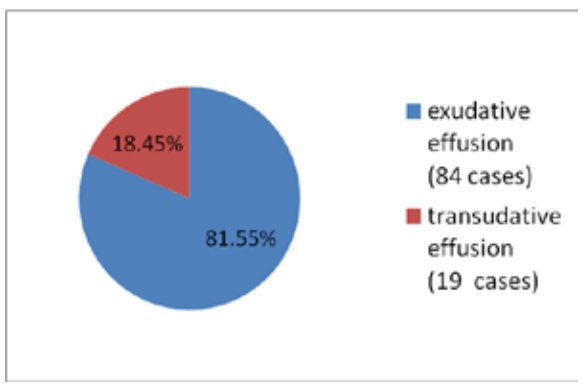
- To identify incidence of various causes of pleural effusion in India.
- To classify various causes in to transudative and exudative for further evaluation.
- To determine role of cytological examination of pleural fluid in diagnosis of malignant effusion.

Materials and Method:

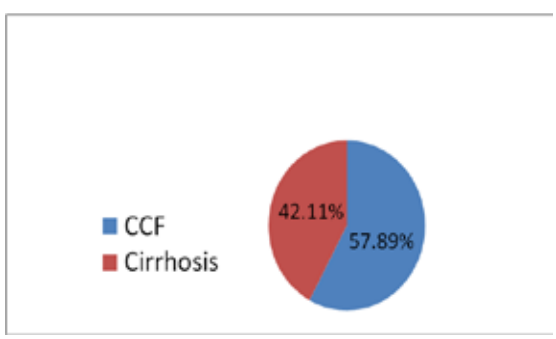
- A study of 103 samples received during June 2014 to September 2014 was carried out in our tertiary care teaching hospital, Ahmedabad, Gujarat. After centrifuging the fluid was divided into two parts, one part was used for cell count and the other part was used for cytology.
- For cell count some part of sediment from centrifuge tubes was mixed with a drop of toluidine blue and the cells were counted in an improved Neubauer counting chamber
- From remaining sediment slide was prepared and examined.Fluid was also subjected to biochemical study for protein, LDH and glucose. Blood samples were also collected in plain tube for obtaining pleural fluid/ serum protein and pleural fluid/serum LDH ratio.

Results:•

- TOTAL NUMBER OF CASES EXAMINED- 103
- Exudative = 84 cases
- Transudative = 19 cases



Out of 103 cases 19 cases ,Transudative effusion of which
Congestive cardiac failure- 11
Cirrhosis of liver - 8

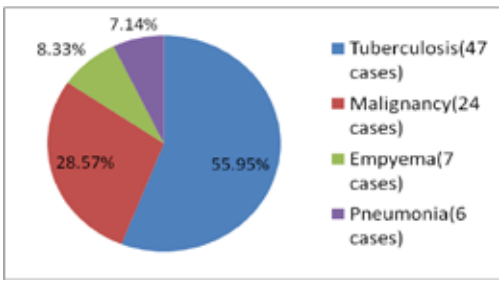


Exudative effusion:

- Out of 103 cases 84 cases were of exudative effusion of which

Tuberculosis -47 cases
Malignancy -24 cases
Empyema -7 cases
Pneumonia -6 cases

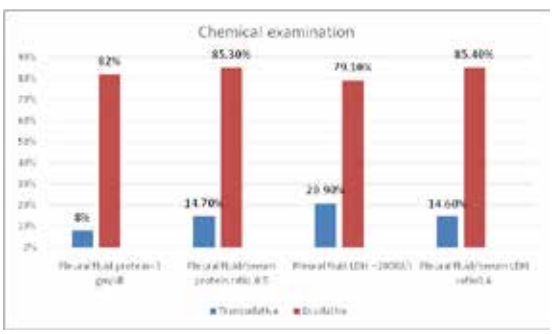
Distribution of various exudative effusion:



Total Leucocyte count :

No of cases	< 1000 cells / cmm	>1000 cells / cmm
Transudative cases	17 cases	2 cases
Exudative cases	40 cases	44 cases

Chemical examination:

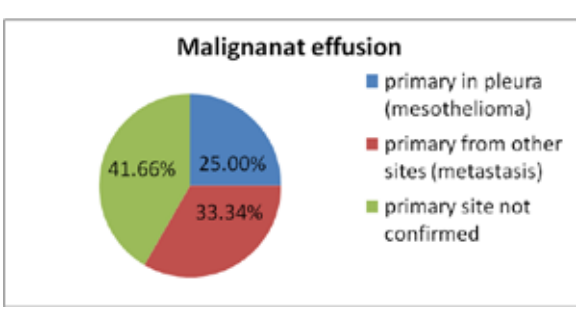


TUBERCULOUS EFFUSION

	NO OF CASES (Total 47 cases)	PERCENTAGE
>50 Lymphocyte	44 cases	93.61%
<50 lymphocyte	3 cases	6.39%
>5gm/dl protein	33 cases	70.21%
<5gm/dl protein	14 cases	29.79%
<60mg/dl glucose	39 cases	83.22%
>60 mg/dl glucose	8 cases	16.78%

MALIGNANAT EFFUSION

Total malignant effusion - 24 cases
Primary site confirmed - 14 cases
Primary in pleura - 6 cases
Primary from other sites - 8 cases
Primary site not confirmed - 10 cases



Empyema: Total cases 7 cases

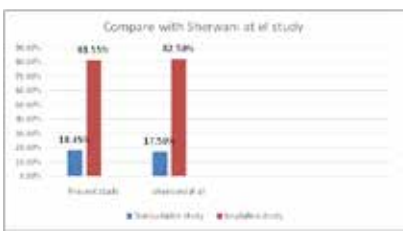
➢ Leukocyte count in the range of 5000/µl to 25,000/µl with predominance of neutrophils >50% seen in all cases.

Pneumonia: Total cases 6 cases

➢ All cases shows very high leukocyte count(> 50,000/µl) with predominance of neutrophils.

Discussion:

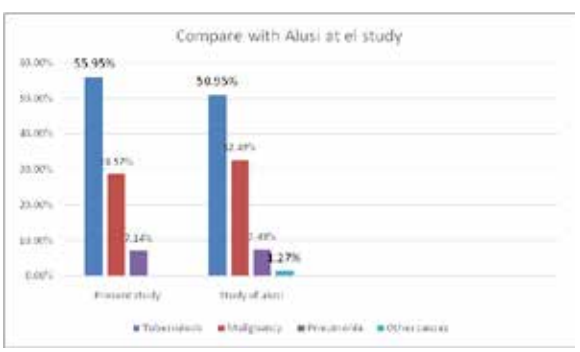
- The relative ease of pleural fluid aspiration analysis and cytological examination has kept alive the search for a test to unequivocally differentiate the various causes of effusion.
- The present study deals with the accuracy of diagnosis on the basis of contemporary cytological features and cell count.
- In present study most of effusion(81.55%) were exudative. This findings are in line with study done by Sherwani at el.[1]



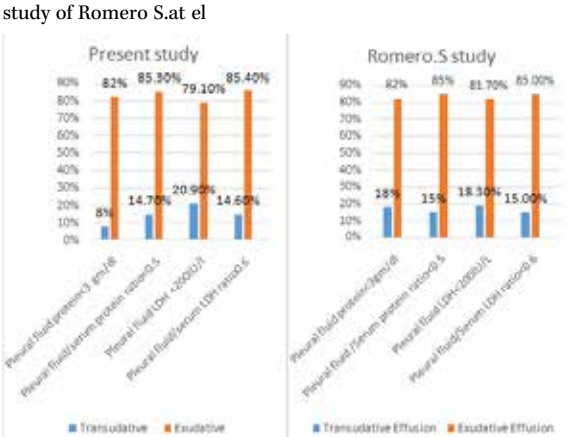
- In present study most of exudative effusion were due to Tuberculosis(55.95%) followed by Malignancy,

Empyema and Pneumonia.

- This results were comparable with study of Alusi.[2]

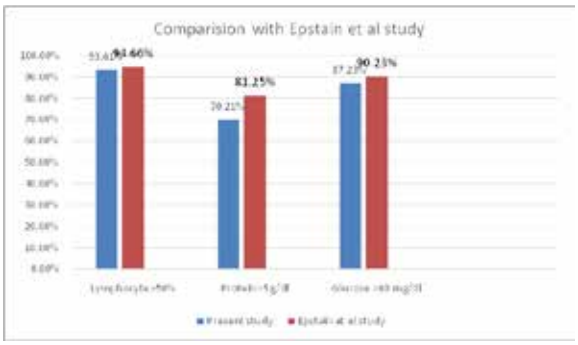


Comparision of chemical examination of present study with study of Romero S.at el



In this study majority of tuberculous effusions had >50% lymphocytes, 70.21% had >5 gm/dl of protein and 87.23% had glucose >60mg/dl.

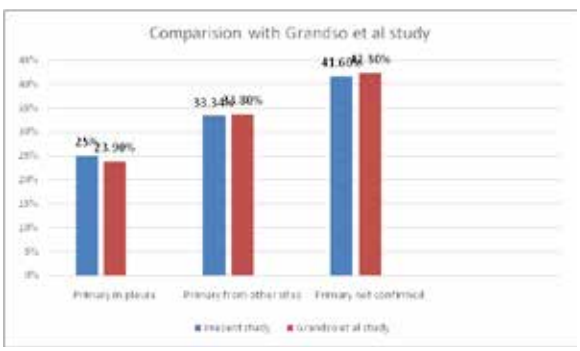
- This findings were comparable with study done by Epstain et al.[4]



➢ In present study in 25% cases - primary was in pleura33.34% cases - metastasis from other sites

41.66% cases - primary site was not confirmed

➢ This findings were in line with study done by Grandso et al.[5]



Conclusion:

- Pleural fluid cytology, cell count and chemical examination are important for knowing aetiology of effusion.

- As compared to biopsy pleural fluid cytology is simple and relatively non-invasive technique for differentiating benign from malignant effusion but for final confirmation histology is necessary.

- Diagnostic performance may be attributable to the fact that the cell population present in the sediment is representative of a much larger surface area than that obtained by needle biopsy.

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