# PLEURAL EFFUSION;
## PATTERN AT NISHTAR HOSPITAL, MULTAN

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**ABSTRACT… Objective:** To determine the frequency of various diseases presenting with pleural effusion. **Setting:** Department of Chest Medicine, Nishtar Hospital, Multan. **Period:** March 2010 to September 2010. **Material and methods:** A total of 100 patients both sexes, more than 12 years old, with clinically and radiologically confirmed pleural effusion underwent diagnostic thoracocentesis. Pleural fluid was examined grossly and for sugar, protein, LDH, total and differential white cell count and malignant cells. Pleural fluid culture and pleural biopsy was done in case of exudative effusion. Results: Tuberculosis was the most common cause (28%) of exudative pleural effusion followed by parapneumonic effusion (25%) and malignant effusion (9%). Congestive cardiac failure (13%) and liver cirrhosis (8%) were the commonest cause of transudative pleural effusion. Renal failure (5%), nephritic syndrome (2%), pancreatitis (2%), systemic lupus erythmatosus (2%) were the other significant causes of pleural effusion. Conclusion:- Tuberculosis, paraneumonic effusion and malignancies are the common cause of exudative pleural effusion while congestive cardiac failure, liver cirrhosis and nephritic syndrome are common causes of transudative effusion.

**Key words:**Tuberculosis, Exudativee, Transudative.

## INTRODUCTION

Pleural effusion can be manifestation of a wide range of local and systemic diseases[1]. The most common symptom of pleural effusion is dyspnea. Pleural effusion becomes clinically detectable when 500 ml fluid is present in pleural space. It is visually detectable on posterior-anterior (PA) chest x-ray film when 200 ml of pleural effusion is present and as 50 ml on lateral film[2]. As little as 5-10 ml of pleural fluid can be demonstrated with a lateral decubitus view[3]. Pleural effusion is classified as exudative and transudative on the basis of Light's criteria[4] which has an overall accuracy of 95%[5].

Common causes of exudative effusion are tuberculosis, malignancy, pneumonia, pulmonary embolism and viral infection while transudative effusion is usually due to heart failure (CCF), liver cirrhosis, nephritic syndrome, peritoneal dialysis and myxedema.

Pleural fluid analysis is mandatory in all cases of pleural effusion. If the effusion is exudative, then additional tests may be needed. Pleural fluid cytology helps in the diagnosis of malignant effusions. If the cytology is negative but there is strong clinical suspicion of malignancy then thoracoscopy is the procedure of choice6. Pleural fluid culture is positive less than 40% cases of tuberculous effusion7. In this situation, the determination of adenosine deaminase (ADA) and interferon gamma levels in pleural fluid are sensitive and specific biomarkers of tuberculous pleurisy8. Pleural fluid culture is negative in upto 50% cases of pleural effusion. It is either because of prior antibiotic therapy or lack of facilities for anaerobic culture. No diagnosis is ever established in a number of patients despite invasive investigations such as thoracoscopy and open pleural biopsy.

## OBJECTIVE

To determine the frequency of various diseases presenting with pleural effusion.

## MATERIAL AND METHODS

This study was conducted at the Department of Chest Medicine, Nishtar Hospital, Multan from March 2010 to September 2010. A total of 100 patients both sexes, more than 12 years old, with clinically and radiologically confirmed pleural effusion underwent diagnostic thoracocentesis. Pleural fluid was examined grossly and for sugar, protein, LDH, total and differential white cell count and malignant cells. Pleural fluid culture and pleural biopsy was done in case of exudative effusion.

## RESULTS

Age of patients ranged from 10-70 years, 72% of patients were 40 years old or younger and 59% were female. Six health care workers were identified in this group (Table-I).

**Table-I. Causes of pleural effusion (n=100)**

| Disease | Male | Female | Total |
|---|---|---|---|
| Tuberculosis | 16 | 12 | 28 |
| Parapneumonia | 16 | 09 | 25 |
| Malignant | 06 | 03 | 09 |
| CCF | 09 | 04 | 13 |
| Liver cirrhosis | 03 | 05 | 08 |
| Renal failure | 05 | - | 05 |
| Nephritic syndrome | 01 | 01 | 02 |
| Pancreatitis | 02 | - | 02 |
| SLE | - | 02 | 02 |
| Pulmonary embolism | 01 | 01 | 01 |
| Scleroderma | - | 01 | 01 |
| Sclerotherapy | 01 | - | 01 |
| Liver abscess | 01 | - | 01 |
| Hypothyroidism | 01 | - | 01 |
| Cushing syndrome | - | 01 | 01 |
| Total | 61 | 39 | 100 |

Pulmonary disease diagnosed in (50%) patients and extra-pulmonary tuberculosis in (40%) patients (Table-II).

Twenty patients had side effects from anti-tuberculous drugs. Hepatitis/disturbed LFT's were the commonest side effect which were observed in 15 patients. Other side effects were skin rashes, gastrointestinal disturbance and joint pains. All patients with disturbed LFT's were able to continue the treatment after reintroduction of ATT. 146 (73%) cases were treated with fixed dose combination treatment. Diabetes mellitus was present in 26 patients (16 male and 10 female). Diabetes was with 17 cases of pulmonary tuberculosis and 9 cases of extra-pulmonary tuberculosis. Five patients had associated chronic liver disease. All of them tolerated anti-tuberculous treatment and completed their treatment. All patients came for treatment from all parts of Multan and few of them came from outside the city. About 90% of patients came from adjacent towns, within 5 km of hospital. The mortality was 1% but default rate was around 27%.

**Table-II. Bacteriology of parapneumonic effusion (n=200)**

| Bacteria | Male | Female | Total |
|---|---|---|---|
| Staph aureus | 02 | 02 | 04 |
| Strep pneumonia | 02 | 01 | 03 |
| Gram +ve diplococci | 03 | - | 03 |
| Pseudomonas aerug | 01 | - | 01 |
| Total | 08 | 03 | 11 |

**Table-III. Sources of malignant effusions**

| Source | Male | Female | Total |
|---|---|---|---|
| CA bronchus | 03 | - | 03 |
| Pelvic growth | - | 02 | 02 |
| CA prostate | 01 | - | 01 |
| Hodgkin's disease | - | 01 | 01 |
| NHL | 01 | - | 01 |
| Primary unknown | 01 | - | 01 |
| Total | 06 | 03 | 09 |

## DISCUSSION

Tuberculosis was the most common cause of pleural effusion. Tuberculosis is very common in Pakistan and is the commonest cause of exudative effusion[9]. Up to 53% cases of lymphocytic exudative effusion are tuberculous in nature[10]. Although tuberculosis is less common in developed countries, 25% cases of pleural were found to be tuberculous in nature in Spain[11]. AFB stain was not positive in any case of tuberculous effusion. Mycobacterium tuberculosis/AFB is rarely positive in tuberculous pleural effusions[12]. It is because there are

few bacilli in the effusion and tuberculous pleuritis is due to hypersensitivity to tuberculo-protein rather than actual infection[13].

Among parapneumonic effusions, pleural fluid culture was positive in 11 cases (25%) and staph aureus was the most common organism isolated followed by streptococcus pneumoniae. In literature, streptococci and staph aureus are the commonest organisms that cause parapneumonic effusion while recent studies show that pseudomonas is becoming a common pathogen[14].

A study showed that among pleural biopsies that were cultured, 92% had positive culture with growth of pseudomonas (32%), E coli (29%), staph aureus (10%) and S. pneumoniae (8%)[15]. In our study, culture was positive in 44% cases of parapneumonic effusion that is similar to other studies[16] in which less than 50% cultures were positive. This low culture positivity may be due to prior administration of antibiotics[17].

Carcinoma of bronchus was the most common cause of malignant effusion in males while pelvic malignancies were most common cause in females. A recent study showed that 18% of pleural effusions were malignant in nature[18]. The low percentage of malignant effusions in present study may be due to relatively high prevalence of tuberculosis in our country.

Among the transudative, CCF was the most common cause. The low number of cases of CCF in this study may be because most cases of CCF are managed in Cardiology wards[19]. Liver cirrhosis was the second most common cause of transudative effusion. It may because of high incidence of viral hepatitis. Five (62%) out of 8 patients were HBsAg positive while remaining were anti-HCV positive. None of the patients had dual infection.

Five cases of pleural effusion resulted from chronic renal failure. Three cases were transudative while 2 were exudative in nature. Patients on hemodialysis can have exudative or transudative effusion[20]. Transudative effusions in patients with uremia in this study may be due to volume overload. Two (2%) patients had pleural effusion secondary to nephritic syndrome. Other diseases continued a small number of cases of pleural effusion including scleroderma, hypothyroidism, SLE, sclerotherapy of esophageal varices and liver abscess.

Overall these results are identical to other studies with variations which are also reflected in other local studies such as high proportion of tuberculous pleural effusion. However, the diagnosis was presumptive and of exclusion in a number of patients including pancreatitis, sclerotherapy, cushing syndrome and hypothyroidism. Had strict criteria be applied, the cases could have been labeled as undiagnosed.

## CONCLUSIONS

Tuberculosis, paraneumonic effusion and malignancies are the common cause of malignancies are the common cause of pleural effusion in this area while heart failure (CCF) and liver cirrhosis are the causes of trausudative pleural effusion. Less common causes include renal failure, nephritic syndrome, hypothyroidism, pulmonary embolism and SLE.



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"Friends may come and go,
but enemies accumulate."

***Thomas Jones***