

AETIOLOGY OF EXUDATIVE PLEURAL EFFUSION IN DISTRICT D. I. KHAN

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Pleural effusion is commonly seen in the clinical practice. A large number of diseases can cause it. Its causes are variable in different communities. Transudative effusions pose little diagnostic difficulty as compared to the exudative ones. In this study we investigated the aetiology of exudative pleural effusion in adult patients in our setup. It is a cross-sectional study. From January 1st to June 30th, 2002, we studied adult patients presenting to Medical unit DHQ Teaching Hospital D. I. Khan, Pakistan, having a pleural effusion confirmed by chest radiographs. Patients having clinical and/or laboratory evidence of transudative pleural effusion were excluded from the study. A detailed history and thorough clinical examination was recorded. Routine investigations were performed. Thoracocentesis and pleural fluid analysis were performed in all patients. Pleural biopsy was taken in patients with exudative pleural effusion. Other investigations were performed according to the clinical indication. Fifty patients with pleural effusion were studied. Out of these, 22 had exudative pleural effusion. Further investigations revealed that 15/22 (68.18%) had tuberculosis, 3/22 (13.63%) had neoplasia, 2/22 (9.09%) had amoebic infection, 1/22 (4.54%) had para-pneumonia and 1/22 (4.54%) had ampyema thoracic. We conclude that of the exudative pleural effusion in this region is mainly due to tuberculosis. Neoplasia is the second common cause in adult population. Amoebiasis should be considered in right sided pleural effusions.

Pleural effusion is a common condition seen in clinical practice. Its management depends upon the cause. At times it is difficult to determine the cause, as shown by the 'unknown aetiology' rates (up to 20% reported) in some of the studies.^{1,2} This is due to a large number of diseases responsible for this condition.³ The aetiology of pleural effusion also varies in different geographical regions and patient age groups. The distribution observed in each study also depends upon the type of patients covered; such as primary care patients or referred ones.⁴ In clinical practice transudative pleural effusions pose little diagnostic difficulties as compared to the exudative ones. A large number of diseases can cause this condition, including tuberculosis, pneumonia, malignancy, connective tissue disorders, amoebiasis pulmonary infarction and drug induced reactions. Tuberculosis is the first diagnostic consideration for exudative pleural effusion in our set up. It should specifically be considered if exudative fluid is predominantly lymphocytic. Pleural fluid culture in patients with tuberculous pleural effusion grows Mycobacterium tuberculosis in a fewer than 65% of the cases. The

histological examination and culture of the pleural tissue obtained by closed needle pleural biopsy increases the diagnostic yield to 80% to 90%.^{5,6} In case of malignant pleural effusions, a single pleural fluid cytology detects 54 to 65% of malignancies; the yield increases to 77% when serial samples are processed.⁷ Evaluation of pleural effusion begins with a chest radiograph which can detect effusion greater than 150ml.⁸ Chest ultrasound and computer tomography are more reliable for detecting and localising small pleural effusions⁹ and may identify and localise foci of empyema that may require chest intubation or surgical drainage.^{10,11} Once pleural effusion one must find out the cause.¹²

We conducted this study to know the aetiology of exudative pleural effusions among adult patients in our setup.

MATERIAL AND METHODS

From January 1st to June 30th, 2002, we studied those adult patients who attended the medical clinic or were admitted the Medical unit of DHQ Teaching Hospital D.I. Khan, Pakistan, having a

pleural effusion confirmed by chest radiograph. Patients having clinical and/or laboratory evidence of transudative pleural effusion, like congestive cardiac failure, nephrotic syndrome or hypoproteinaemia due to any other cause were excluded from the study. A detailed history and thorough clinical examination was undertaken for each patient. Routine investigations including full blood count (FBC), ESR, biochemistry and urinalysis were performed for all patients. Thoracocentesis and pleural fluid analysis were also performed. Pleural biopsy was performed in patients having exudative pleural effusion, with Abraham's needle.^{14,15} Other investigations were performed according to the clinical indications; like auto-antibody screening for connective tissue disorders. The diagnosis of various conditions was based on the following criteria:¹⁶

- **Tuberculosis:** Positive sputum AFB or caseous granulomas on biopsy.
- **Para-pneumonia:** Associated with pneumonia, lung abscess or bronchiectasis.
- **Empyema:** Purulent fluid or positive pleural fluid culture in cases of para-pneumonic effusions.
- **Amoebiasis:** Presence of Entamoeba histolytica trophozoites in the pleural fluid.
- **Neoplasia:** Neoplastic tissue on pleural fluid cytology or biopsy.
- **Pulmonary infarction:** Mismatching ventilation – perfusion radioisotope lung scan.
- **Idiopathic:** Pleural effusion, the cause of which could not be established by any of the diagnostic tests including pleural biopsy.

RESULTS

During the study period 50 patients had pleural effusion. Out of these, 22 were found to have exudative effusion. The age range of these patients was 14 to 80 years, with a mean age of 35.5+3.5 years. Among of these, 17/22 (77.27%) patients were males while 5/22 (22.72%) females, with a male to female ratio of 3.4:1. Regarding the socio-

Table 1: Demographic characteristics of patients with exudative pleural effusion.

Demographic character		Number of patients and percentage
Gender	Male	17 (77.28%)
	Female	5 (22.72%)
Socio-economic status	Lower	15 (68.19%)
	Middle	7 (31.81%)
	Upper	0

economic status, 15/22 (68.18%) were from the poor while 7/22 (31.81%) from the middle class and no patient was found to be from the upper socio-economic class (Table 1).

Regarding the aetiology, 15/22 (68.18%) patients had tuberculosis, 3/22 (13.63%) neoplasia, 2/22 (9.09%) amoebiasis, 1/22 (4.54%) parapneumonia and 1/22 (4.54%) empyema thoracic (Table 2). Comparing the side of pleural effusion in various causes, it was observed that in tuberculosis the involvement of the two sides had no difference. In amoebic and malignant pleural effusions right side was involved in almost all our patients.

Table 2: Causes and left versus right sided distribution of exudative pleural effusions.

Disease	Left	Right	Total
Tuberculosis	8	7	15 (68.18%)
Malignancy	0	3	03 (13.63%)
Amoebic	0	2	02 (9.09%)
Post-pneumonic	0	1	01 (4.54%)
Empyema thoracic	1	0	01 (4.54%)

DISCUSSION

This study was conducted to determine the causes of exudative pleural effusions in adult patients. A total of 22 patients having exudative pleural effusion, aged 14–80 years with a mean age of 35.5+3.5 years, of either sex were included in the study. The demographic analysis shows a high proportion of patients having male sex 77.28% and female 22.72%, with a male to female ratio of 3.4:1. Exudative pleural effusion is common in males. This male predominance may be because in our society males are primarily responsible for outdoor activities with more chances of contracting the infectious diseases and other outdoor hazards.

The most common diagnosis in this study was tuberculosis, that was found in 68.18% of the cases. It was similar to other studies published in Pakistan.¹⁷⁻¹⁹ Malignancy was the second common diagnosis. It was found in 13.63% of the cases. It was similar to the earlier published data from NWFP.^{20,21} In a study by Anwar²¹ (2005) carried out in the same province revealed 52.71% patients with lymphocytic exudative pleural effusion having tuberculosis and 18.91% malignancy. Another similar study by Khuram et al¹⁷ (2002) from the province of Punjab the two commonest diagnoses were tuberculosis and adenocarcinoma, 64.40% and 13.55% respectively. The increased incidence of tuberculosis is obvious from the high prevalence of tuberculosis in our region.

It was observed that most of the exudative pleural effusions (86.36%) were of infective origin. Contrary to the general belief that amoebic pleural effusion is a rare complication of amoebic intestinal infection leading to amoebic liver abscess, it was found that 9.09% (2.22) cases had this aetiology in this study. Para-pneumonic pleural effusion and empyema were found in 4.54% cases each. To overcome the infective causes of exudative pleural effusions i.e. tuberculous and amoebic, strategies should be adopted for effective tuberculosis control and improved hygiene and sanitation with safe drinking water supplies. The malignant aetiology may not be of the same proportion in other younger age groups. Comparing the side of pleural effusion, in this study, right sided pleural effusion was more common (59.09%) as compared to the left sided (40.91%). It may be due to the reason of major lymphatic drainage from the lower part of the body on that side.

Although this study was on a rather small number of patients, it emphasizes the fact that further evaluation causes exudative pleural effusion in larger number of patients in this area.

As a **conclusion** most of the exudative pleural effusions in this region are due to tuberculosis. Neoplasia is the second common cause in adult population. Amoebiasis should be considered in right sided pleural effusions.

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