Clinical and Etiological Profile of the Patients Presenting With Pleural Effusion

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Abstract: Background: Pleural effusion is an abnormal collection of fluid in the pleural space between the visceral and the parietal pleura and results most imminently due to an underlying infection like pneumonia, tuberculosis etc .Objective: To study the clinical and etiological profile of pleural effusion in patients admitted at a tertiary care centre. Methods: A prospective study was conducted on 350 cases with age more than 16 years, who were the suspected cases of pleural effusion and the cases with evidence of pleural effusion on the X-ray, CT scan , USG presented to the OPD/ IPD, Department of Pulmonary Medicine, Rohilkhand Medical College and Hospital (RMCH), Bareilly from July 2013 to September 2014 were included in the study. Results: out of 350 patients enrolled in the study, 234 (67.14%) belonged to age group of 16-30 years. 247 (70.57%) were male and 103 (29.42%) were female. Tubercular effusion is the commonest cause of unilateral pleural effusion followed by parapneumonic effusion and congestive heart failure is the commonest cause of bilateral pleural effusion. Conclusion: The study concludes that the most common cause of the unilateral pleural effusion was the tuberculosis in 204 (58%) followed by the pneumonia in 88 (25%).Breathlessness followed by the chest pain were the most common clinical symptoms. The most common etiology of the bilateral pleural effusion is transudative. [Amit K NJIRM 2017; 8(2):126-129]

Key words: Pleural effusion, Tuberculosis, Pneumonia

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Introduction: Pleural effusion is the accumulation of fluid in the pleural cavity and it is a common clinical finding encountered in general practice. Normally, the pleural space is a potential cavity encased between the visceral and parietal pleura. Based on the physiology of normal pleural dynamics in animals, it has been postulated that excessive fluid accumulates in pleural space, due to excessive formation, inadequate drainage, or a combination of excessive formation and inadequate drainage.[1, 2, 3]

A systemic approach to the investigations is needed because of the vast differential diagnosis. Pleural effusions can be transudative or exudative.[4,5] In cases with transudative pleural effusion, the diagnosis is usually easily made without much difficulties but exudative pleural effusion requires careful workup. Differential diagnosis that includes parapneumonic effusion, tuberculosis, and metastatic cancers which are found to be the cases in large number of patients.[6,7,8]

Tuberculosis is the most common cause of exudative pleural effusion in many areas of the world.[9,10] Pleural effusion may be a primary manifestation or a secondary complication of various diseases. In developed countries the common causes of pleural effusions in adults are cardiac failure, malignancy and pneumonia[11,12], whereas in developing countries tuberculosis and parapneumonic effusions are more prevalent[13–16].The etiological distribution of pleural effusion depends on the geographic region, patients age & advances in the diagnosis and treatment of underlying cause. Determining the etiological & clinical profile of Pleural Effusion helps in adoption of regionally optimized diagnosis & therapeutic approach.

Hence, this study was done to evaluate the clinical and etiological profile of patients with pleural effusion.

Methods: This study was conducted on patients with pleural effusion visiting department of Pulmonary Medicine at OPD / IPD of Rohilkhand Medical College and Hospital, Bareilly. Institutional Ethical Committee permission was taken before starting the study and informed written consent was taken from every patient.

A prospective study was conducted on 350 cases with age more than 16 years who were suspected cases of pleural effusion and the cases with evidence of pleural effusion on the X-ray , CT scan , USG presented to the OPD/ IPD, Department of Pulmonary Medicine , Rohilkhand Medical College and Hospital , Bareilly from July 2013 to September 2014 were included in the study.

A detailed clinical data was noted in predesigned data sheet and pleural fluid was sent for complete analysis,

to evaluate the clinical and etiological profile. Other relevant investigations were carried out as per need. Results of this study were analyzed by using SPSS Software version 16.

Table1: Demographic profile of the patients

Parameters	No. of patients (n=350)	%
Age group		
16-30 years	234	**67%**
31-40 years	56	16%
41-50 years	32	9.14%
51-60 years	20	5.71%
› 60 years	8	2.28%
Sex		
Male	247	70.57%
Female	103	29.42%

Table 2: Clinical profile of patients with Pleural Effusion

Symptom	No.of Patients(n=350)	%
Breathlessness	270	77.14%
Chest pain	210	60%
Fever	190	54.28%
Dry cough	105	30%
Productive cough	93	26.57%
Loss of weight and appetite	46	13.14%
Hemoptysis	12	3.42%

Table 3: Etiology of pleural effusion.

Etiology of Pleural effusion	Unilateral	Bilateral	Total no. (n=350)
Tuberculosis	196(96.07%)	8 (3.92%)	204(58%)
Pneumonia	78(88.63%)	10 (11.36%)	88(25%)
Malignancy	26(81.25%)	6 (18.75%)	32(9%)
Eosinophilic	5(62.5%)	3 (37.5%)	8(2.28%)
Transudate	5(27.77%)	13 (72.2%)	18(6%)

Table 4: Correlation of etiology of pleural effusion with sex of patients.

Etiology of Pleural effusion	Males	Females
Tuberculosis (n=204)	172 (84.31%)	32 (15.68%)
Pneumonia (n=88)	61 (69.31%)	27 (30.68%)
Malignancy (n=32)	24 (75%)	8 (25%)
Eosinophilic (n=8)	7 (87.5%)	1 (12.5%)
Transudate (n=18)	14 (77.77%)	4 (22.2%)

Results: A total of 350 patients with Pleural effusion were available for the analysis. Out of 350 patients, majority of patients were in age group of 16-30 (67%) years followed by more than 31-40 (16 %) years. The sex wise distribution was male 247 (70.57%) and female 103 (29.42%). (Table 1)

Breathlessness was the most common symptom in 270 patients (77.14%) followed by chest pain in 210 (60%), fever in 190 (54.28%) and cough in 105 (30%) patients. (Table 2)

Out of 350 patients, 204 (58%) had tubercular pleural effusion followed by pneumonia in 88 (25%) and malignancy in 32(9%). Transudative pleural effusion was found in 18 (6%) patients. (Table 3)

Most common cause of unilateral effusion was tuberculosis in 204 (58%) patients followed by pneumonia in 88 (25%) and malignancy in 32 (9%) patients. The most common cause of the bilateral pleural effusion was transudative in 13 (72.2%) patients. (Table 3)

Discussion: The pleural effusion, an extrapulmonary sickness need thorough evaluation for definitive diagnosis and proper management. Out of the total 350 cases studied**,** 247 (70.6%) were males and 103 (29.4%) were females in our study. The male preponderance has also been observed by Khan FY et. al.(2011)[17] and Valdes LV et.al. (1996)[18] Approximately equal male female ratio was noticed by Dhital KR et. al. (2009)[19]and Ogunleye EO et al (2013)[20].The majority of the patients, 234 (67.14%) were in 16-30 years age group followed by 56 (16%) in 31-40 years of age group. Dhital KR et al (2009) observed majority of the patients in 21-30 years age group[19]. The mean age was found to be 45.1 ± 18.5 years[17], 57.8 ± 21.4 years [18], 44.89 ± 21.59 years[19] and 37.8 ± 0.98 years[20].

The commonest presenting symptom is breathlessness in 270 (77.14%) patients was observed in our study, followed by chest pain in 210 (60%), fever in 190 (54.3%) and cough in 105 (30%) of the patients studied. The breathlessness, cough and fever are the commonest presenting symptoms were also observed by Dhital KR (2009)[19].

Sputum profile (culture,Gram's stain, AFB stain and cytology) is of much help in the work up of patient with parapneumonic pleural effusion. Pleural fluid analysis is the definite mode of separating transudative from exudative pleural effusion.

Tuberculosis is the commonest etiology of unilateral pleural effusion in 204 (58%) patients followed by parapneumonic effusion in 88 (25%) patients and malignancy in 32 (9%) patients in our study. Tubercular effusion is the commonest cause of exudative pleural effusion in many areas of the world, which is similar with our study[17, 18, 19, 21]. The unilateral effusion was seen in 310 (88.6%) of the cases in this study. 196 (96%) of 294 tuberculosis cases, 78 (88.6%) of 88 pneumonia cases and 26 (81.25%) of 32 malignancy cases had unilateral pleural effusion. Several workers have also observed right sided pleural effusion in majority of cases in their studies.[17-20]

The common causes of pleural effusion which have been observed in the various studies are tuberculosis, neoplasia, parapneumonic pleural effusion, CHF, empyema, Pulmonary thromboembolism, renal diseases, liver diseases, paramalignant and SLE.[17-22] In the malignant group, the common location were lung in most of the cases followed by Ca breast, lymphoma, ovary, stomach, colon and mesothelioma. The organs such as oesophagus, uterus, thyroid, liver, pancreas, kidney, thymus were less commonly involved.[17, 18, 20, 22] The malignancy was observed to be the commonest cause of pleural effusion in some studies. Storey DD and coworkers at Mayo clinic in a series of 133 patients, noticed malignancy in 50% of patients with pleural effusion and that nearly one third of the patient with malignancy and effusion had lymphoma.[6] Khan KY[17] observed carcinoma in 31 (15.5%) cases, of them 12 (38.7%) had bronchogenic carcinoma, a frequent cause. Ogunleye ED et al (2013) observed malignancy in 212 (57%) cases, bronchogenic carcinoma in 29 (46.7%) of all malignancies. Of them 211 (56.7%) had right sided, 124 (33.3%) had left sided and 37 (9.9%) cases had both sided pleural effusion. Predilection for right sided effusion was observed in both the sexes. Villena V[22]also noticed malignancy in 364 (36.4%) of 1000 cases. But in Veldes V series, the malignancy was second commonest cause in 147 (22.9%) after tuberculosis, 166 (25%) of 642 patients. The most frequent location of primary tumour was lung in 48 (32.6%), 17(11.5%) had breast, 16 (10.8%) had lymphoma and 11(7.5%) had ovary carcinoma.

A systemic approach to the classification of pleural effusion is needed because of extensive differential diagnosis. Diagnostic exploration is based on the analysis of clinical variables (gender, age and symptoms), imaging (chest x-ray, USG of chest) and laboratory analysis of blood and pleural fluid. Tubercular effusion is the common cause of exudative pleural effusion in many areas of the world which is consistent with our study which shows that 204 (58%) patients were having tubercular effusion out of 350.

Conclusion: The study concludes that the most common cause of the unilateral pleural effusion was tuberculosis in 204 (58%) followed by the pneumonia in 88 (25%). Breathlessness followed by the chest pain were the most common clinical symptoms .The most common etiology of the bilateral pleural effusion was transudative. Pleural fluid analysis is the diagnostic method to distinguish exudative from transudative pleural effusion.

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