ORIGINAL ARTICLE

Study on Pleural Effusion for Diagnostic Approach

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ABSTRACT

Background: Pleural effusion occur because of abnormal collection of fluid in pleural cavity. There are various causes of pleural effusion so we have diagnose these cause and treat underlying cause.

Objective: Objective of the present study was to study the various symptoms, causes and chemical characteristic of pleural effusion.

Material and Method: This Cross Sectional study carried out at Respiratory Medicine Department, Medical College Baroda, Vadodara. In this study total 100 patients were enrolled in.

Results: In Our study most common affected age group was 31-40(38%), followed by 41-50 (17%). Most common symptom was Chest pain in 78% of patients, Breathlessness in 66% patients, Fever in 48 % patients and cough in 42% of patients and hemoptysis in10% of patients. Tuberculosis was most common cause of pleural effusion in 68% of patients. Malignant effusion present in12% of patients, Parapneumoniac effusion present in 8 % of patients. Pleural fluid protein>3gm/dl found in 95.6% of tuberculosis patients, 83.4% of malignant effusion patients, 87.5% of parapneumonic effusion patients. In all 4 cases of CCF and Hypoproteinemia, pleural fluid protein was<3gm/dl. ADA>40 in 95.6% of tuberculosis patients and 25% of malignant effusion patients.

Conclusion: In our study, Pleural effusion was more common in male and middle aged person. Most common symptom was chest pain and most common cause of pleural effusion was tuberculosis in our study.

Key words: Pleural Effusion, Tuberculosis, Chest pain

INTRODUCTION

Pleural effusion is defined as accumulation of abnormal quantity of fluid in pleural cavity. Normally each pleural cavity contains 8.4 ± 4.3 ml fluid.[1]. Pleural fluid accumulates when the rate of pleural fluid formation exceeds the rate of pleural fluid absorption. Normally, a small amount (0.01ml/kg/hr) of fluid constantly enters the pleural space from the capillaries in the parietal pleura. Almost all of this fluid is removed by the lymphatics in the parietal pleura which have a capacity to remove at least 0.20ml/kg/hr.[2]

Pleural effusions are classified in two types, Transudative and exudative.[3] A Transudative pleural effusion occurs when the balance of hydrostatic forces influencing the formation and adsorption of pleural fluid is mismatched to favor pleural fluid accumulation. In a exudative effusion the local capillary permeability are altered.[4] The most commonly associated symptoms are progressive dyspnoea, cough and pleuritic chest pain. Fever, weight loss, hemoptysis and night sweats suggest tuberculosis. On physical examination, dullness to percussion, decreased tactile fremitus and asymmetrical chest expansion are the most reliable findings of pleural effusion.[5]

OBJECTIVES

1. To study the various symptoms of pleural effusion
2. To study the various causes of pleural effusion.
3. To study the various chemical characteristic of pleural fluid.

METHODS

This Cross Sectional study carried out at Respiratory Medicine Department, Medical College Baroda, Vadodara. In this study total 100 patients were enrolled. Patients having pleural effusion and sufficient amount of aspiration done for diagnosis were included in the study. Patients having a Non aspirable pleural effusion or not wiiling for aspiration were exclud-

ed from the study. Those patients who included in study all of them undergone for detail clinical examination, routine laboratory investigation and radiological investigation. Those who patient needed additional investigation like 2D echo, Ultrasound of chest and CT scan done for confirmation of diagnosis.

RESULTS

1) Age and Sex: As shown in Table No 1. In our study Most common affected 38 patients (25 male and 13 female) were from age group 31-40 followed by 17 patients from age group 41-50. Pleural effusion was more common in male (69 patients) than female (31 patients).

2) Symptom and Cause: As hown in Table No. 2. Most common presenting symptom of pleural effusion was chest pain in 78 patients, Breathlessness in 66 patients, fever in 48 patients, cough in 42 patients and hemoptysis in 10 patients. As shown in Table No. 3. Most common cause of pleural effusion was Tuberculosis in 68 patients, followed by Malignant effusion in 12 patients, Parapneumonic effusion in 8 patients. Due Congestieve cardiac failure and Hypoproteinemia pleural effusion found in 2-2 patients. 8 patients were undiagnosed.

Table 1: Age and Sex wise distribution in Pleural effusion

Age group (Years)	Male (n=69)	Female (n=31)	Total (%)
11-20	5	2	7 (7)
21-30	12	3	15 (15)
31-40	25	13	38 (38)
41-50	11	6	17 (17)
51-60	6	3	9 (9)
61-70	5	2	7 (7)
71-80	4	2	6 (6)
>81	1	0	1 (1)

Table 2: Symptoms in cases of Pleural Effusion

Symptom	No. of Patients
Chest Pain	78
Breathlessness	66
Fever	48
Cough	42
Hemoptyis	10

Table 3: Causes of Pleural Effusion.

Diagnosis	Patients (n=100)
Tuberculosis	68
Malignancy	12
Parapneumonic	8
Congestive cardiac failure	2
Hypoproteinemia	2
Undiagnosed	8

3) Radiological and Biochemical Report: In Tuberculosis most of patients had a unilateral effusion, and 2 patients had a bilateral effusion. In malignant effusion also unilateral effusion was more common, out of 12 patients 9 patients had a unilateral effusion and 3 patients had a bilateral effusion. All 8 patients of Parapneumonic effusion had a unilateral effusion. All patients of Congestive cardiac failure and Hypoproteinemia had a bilateral effusion.

Detail Biochemical investigation of pleural fiuid done which showed pleural fluid protein >3gm/dl found in 65 patients (95.6%) of tuberculosis, 7 patients (87.5%) of parapneumonic effusion and 10 patients(83.4%) of Malignant effusion. Pleural fluid protein found <3gm/dl in all patients of Congestive cardiac failure and Hypoproteinemia. Adenosine deaminase (ADA) >40 found in 65 patients (95.6%) of tuberculosis, 3 patients (25%) of Malignant effusion, 3 patients(37.5%) of Parapneumonic effusion.

DISCUSSION-

In our study total 100 patients were enrolled. Through Clinical examination, Blood investigation, required detail Radiological investigation and biochemical analysis of pleural fluid, we diagnosed 92 patients out of 100 patients. In rest 8 patients required skilled surgical intervention like Thoracoscopy and Open Thoracotomy for confirmation of diagnosis.

In our study Pleural effusion was more common in male (69%) than female (31%). And adult age group of 31-40 years was most commonly affected. According to Light's Pleural disease 6th ed, Most common symptom is chest pain, second common symptom is cough and third common symptom is breathlessness.[6] In our study most common presenting symptom was chest pain in pleural effusion, 78 patients presents with this symptom. This pain was pleutic type of chest pain which was classically aggravate on breathing and coughing.

In our study Tuberculosis was most common cause (68%) of pleural effusion, followed by malignant effusion (12%), Parapneumonic effusion (8%). TB was the most common etiologyof pleural effusion, acconting for 25% of all pleural effusion.[7] A study from Saudi Arabia about the same time demonstrated that TB was also the most common cause of pleural effusion in the country, accounting for 37% of all pleural effusions.[8]

CONCLUSION

Pleural effusion more common in male and middle aged person. Chest pain was most common symp-

tom in pleural effusion and Tuberculosis was most common cause of pleural effusion in our study.

REFRENCES

1. Noppen M, De Waele M, Li R, et al. Volume and cellular content of normal pleural fluid in humans examined by pleural lavage. Am J RespirCrit Care Med 2000; 162:1023-1026.
2. Light RW. Pleural Diseases, 6th Edition. Lippincott Williams & Wilkins. 2013:13-14.
3. Paddock FK. The diagnostic significance of serous fluids in disease. N Eng J Med 1940:223:1010-1015.
4. Light RW. Pleural Diseases, 5th Edition. Lippin cott Williams & Wilkins. 2007, 75-76
5. Light RW. Pleural Diseases, 5th Edition. Lippin cott Williams & Wilkins. 2007, 74-75
6. Light RW. Pleural Diseases, 6th Edition. Lippincott Williams & Wilkins. 2013:86-87
7. Valdes L, Alvarez D, Valle JM et al. The etiology of pleural effusions in an area with high incidence of tuberculosis. Chest. 1996;109:158-162
8. al-Qorain A, Larbi EB, al- Muhanna F, et al. Pattern of pleural effusion in eastern province of Saudi Arabia: a prospective study. East Afr Med J. 1994;71:246-249