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Clinical Profile of Patients with Pleural Effusion Admitted to Bharatpur Hospital

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ABSTRACT

Background: Pleural effusion occurs when there is disequilibrium between the quantity of fluid entering and leaving the pleural space. The objective of the study was to investigate the association between pleural effusion and underlying medical conditions as heart failure, pneumonia, malignancies of clinical presentations and laboratory findings of all those patients admitted to Bharatpur Hospital during the period of last 1 year.

Methods: Retrospective data from September 2022 to September 2023 from all the cases diagnosed with pleural effusion will be taken. Altogether 120 cases diagnosed with pleural effusion studied. The collected data was re-checked, reviewed, organized, entered and analyzed in statistical package for social sciences (SPSS) 20.0.

Results: From the findings of the study, 56.7% were male and 60.0% were from outside Chitwan District. Among the various causes of pleural effusion the most common cause was tubercular effusion (30.8%) followed by para-pneumonic effusion (19.2%). Tubercular effusion is Shortness of breath was present in 13.5%, cough in 10.8%. Tubercular pleural effusion is common in the age group 41–50 years and Patients with para-pneumonia, is 97 had lymphocyte and 23 had neutrophil. >3 gm/dl was observed in patients with tubercular effusion and Mean value of ADA for tubercular effusion was 45.8 U/L.

Conclusion: shortness of breath, cough, and Pleural fluid analysis is the diagnostic method to distinguish exudative from transudative pleural effusion. Lymphocyte rich exudative effusion occurs in case of Tubercular effusion and neutrophil rich effusion occurs in para-pneumonic effusion.

Keywords: pleural effusion; exudative; transudative.

INTRODUCTION

Pleural effusion is a common finding in patients presenting with cardiopulmonary symptoms but specific studies are lacking in Nepal. A systemic approach for investigations is needed because of the extensive differential diagnosis. Effusion can be transudative or exudative.[1,2] Transudative is diagnosed without much difficulties but exudative requires careful differential diagnosis in large number of patients.[3-4] It occurs with disequilibrium between the quantity of fluid entering and leaving the pleural space. When fluid formation exceeds the rate of fluid absorption as in increased pulmonary capillary pressure, decreased intrapleural pressure or plasma oncotic pressure, obstructed lymphatic flow, diaphragmatic defects.[5] Tuberculosis is commonest exudative effusion in many areas of the world.[6-9] While in developed world the leading cause of effusion are malignancy, PE, cirrhosis and CHF (87%).[10-13] The objective of this research is to analyze the demographic characteristics of patients with pleural effusion.

METHOD

Retrospective data from September 2022 to September 2023 from all the cases diagnosed with pleural effusion were taken. Altogether 120 cases diagnosed with pleural effusion by chest X-ray (Posterior-

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Anterior view) and Ultrasonogram of the chest were studied. The following parameters were analyzed: Patients demographic profile, causes, location (Unilateral, Bilateral), Blood hemoglobin and count, sputum profile, Mantoux test, chest Xray and USG findings and pleural fluid analysis [Biochemical, Haematological, Microbiological culture and stain and cytological]. This study was analyzed by using SPSS version 20. The study will adhere to ethical guidelines, ensuring patients confidentiality, informed consent and responsible data handling.

RESULTS

All the cases with the diagnosis of pleural effusion admitted to medicine department of Bharatpur hospital from September 2022 to September 2023 were included in the study. The demographic profile of the patients studied is depicted in (Table 1). Out of the total 120 cases, 68 (56.7%) were male

Table 1. Demographic Profile of the patients

Variables	Frequency (%)
Sex	
Female	52(43.3)
Male	68(56.7)
Address	
Chitwan	48(40)
Outside of Chitwan District	72(60)

and 52 (43.3%) female. 48 (40.0%) patients were from Chitwan District and others 72 (60.0%) were from outside Chitwan District. Table 2 shows that, Among the various causes of pleural effusion the most common cause was tubercular effusion (30.8%) followed by para-pneumonic effusion (19.2%). The third most common cause was due to malignant effusion (15.8%), Renal disease (12.5%), followed by liver disease (10.0%) and CCF is (5.0%). Table 3 shows the various symptoms of the patients having pleural effusion. The most common mode of presentation of tubercular effusion and para-pneumonic effusion was shortness of breath where as in case of renal disease and liver disease common mode of presentation was generalized cough. Tubercular effusion is Shortness of breath was present

Table 2. Diagnosis and number of cases

Diagnosis	Frequency (%)
Tubercular Effusion	37(30.8)
Para-pneumonia Effusion	23(19.2)
Malignant Effusion	19(15.8)
Congestive Heart Failure	6(5)
Renal Disease	15(12.5)
Liver Disease	12(10)
Others	8(6.7)

in 13.5%, cough in 10.8%. Para-pneumonia Effusion is Shortness of breath was present in 26.1%, cough in 26.1%. Malignant Effusion is Shortness of breath was present in 63.2%, cough in 52.6%. Congestive Heart Failure is Shortness of breath was present in 66.7%, cough in 66.7%. Renal Disease is Shortness of breath was present in 60.0%, cough in 73.3%. Liver Disease is Shortness of breath was present in 16.7%, cough in

Table 3. Diagnosis and clinical mode of presentation.

Diagnosis	Shortness of Breath	Cough
Tubercular Effusion	13.50%	10.80%
Para-pneumonia Effusion	26.10%	26.10%
Malignant Effusion	63.20%	52.60%
Congestive Heart Failure	66.70%	66.70%
Renal Disease	60.00%	73.30%

25.0%. Various age groups and the clinical diagnosis as shown in the diagram tubercular pleural effusion is common in the age group 41–50 years (Figure 1). Figures 2 show the mean lymphocyte and neutrophil

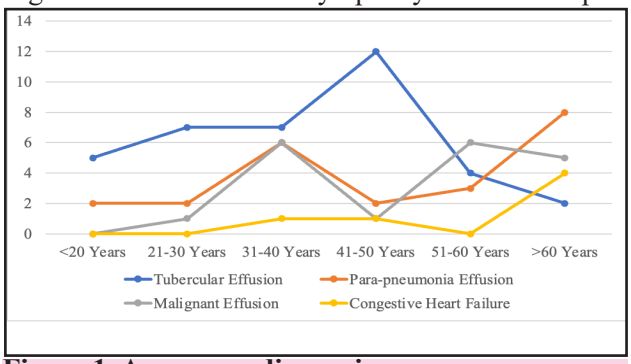

Figure 1. Age group diagnosis

count. Total count and differential count were done for 120 patients out of whom 42 had lymphocytes 78

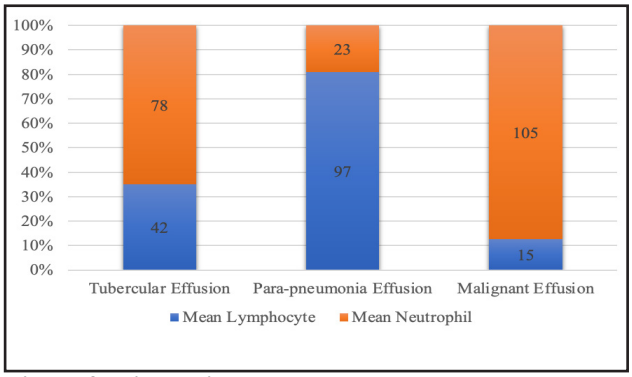

Figure 2. Diagnosis and mean lymphocyte and neutrophil count

had neutrophil. Patients with para-pneumonia, is 97 had lymphocyte and 23 had neutrophil. Malignant effusion, is 15 had lymphocytes 105 had neutrophil. Mean protein level was <3 gm/dl in patient with para-pneumonia, malignant, CCF and Renal disease whereas >3 gm/dl was observed in patients with tubercular effusion (Figure 3). ADA level in pleural fluid was analyzed in 120 patients,

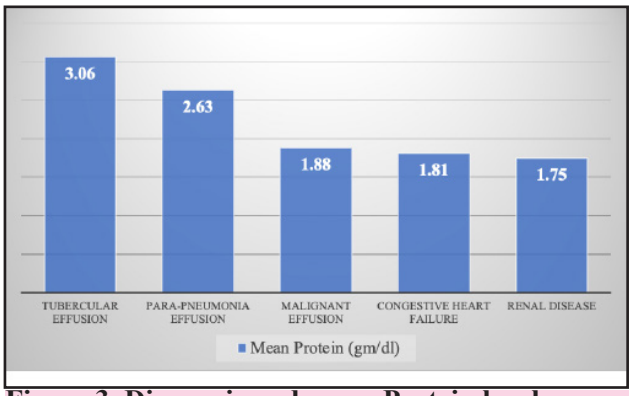

Figure 3. Diagnosis and mean Protein level.

only patient with tubercular pleural effusion show raised level of ADA (>40U/L). Mean value of ADA for tubercular effusion was 45.8 U/L (Figure 4).

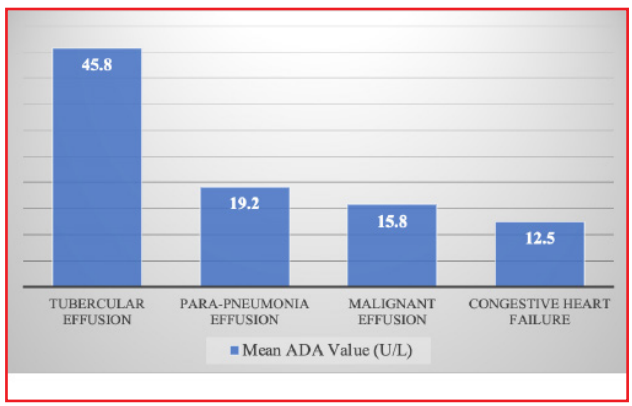

Figure 4. Diagnosis and mean ADA level.

DISCUSSION

Our study concludes that the 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. Out of the total 120 cases, 68 (56.7%) were male and 52 (43.3%) female. This study show that, the most common cause was tubercular effusion (30.8%) followed by para-pneumonic effusion (19.2%). The third most common cause was due to malignant effusion (15.8%), Renal disease (12.5%), followed by liver disease (10.0%) and CCF is (5.0%). Similar to other studies, in the present study tubercular and malignancy are the major causes of pleural effusion. In other study of pleural effusion of which 60.52% were cases of tubercular effusion and 39.48% were cases of non-tubercular effusion. The present study is particularly relevant in regions with high prevalence of tuberculosis.[14-15]The most common mode of presentation of tubercular effusion and para-pneumonic effusion was shortness of breath where as in case of renal disease and liver disease common mode of presentation was generalized cough. In Tubercular effusion cases Shortness of breath was present in 13.5%, cough in 10.8%. Whereas in para-pneumonia effusion Shortness of breath was present in 26.1%, cough in 26.1%. Malignant Effusion shortness of breath was present in 63.2%, cough in 52.6%. Congestive Heart Failure shortness of breath was present in 66.7%, cough in 66.7%. Renal Disease is shortness of breath was present in 60.0%, cough in 73.3%. Liver Disease is shortness of breath was present in 16.7%, cough in 25.0%. Similar to other studies shortness of breath, fever and cough are the commonest mode of clinical presentation. Sputum profile (culture, Gram's stain, AFB stain and cytology) is not of much help in the work up of patient with pleural effusion. Pleural fluid analysis is the definite mode of separating transudative from exudative pleural analysis.[14] This study shows that, age groups and the clinical diagnosis as shown in the diagram tubercular pleural effusion is common in the age group 41–50 years. Similar to other Tubercular effusion studies, and para-pneumonic effusion predominates

among individuals younger than those with malignant effusion and congestive cardiac failure, a fact confirmed by this study (total 62 patients belong to TB Effusion and para-pneumonic effusion which predominate among 21 – 30 age group). [6,7] This study shows that 120 patients out of whom 42 cases had lymphocytes while 78 had neutrophil predominance. In patients with para-pneumonic 97 had lymphocyte and 23 had neutrophil. In malignant effusion 15 had lymphocytes 105 had neutrophil. Similar to other Total count and differential count were done for 100 patients out of whom 61 had lymphocytes >50% and only 39 patients had predominant polymorph nuclear cells. Patients with CCF, malignant effusion, renal disease had low pleural fluid total count whereas patients with para-pneumonic and tubercular effusion had raised pleural fluid total count.[14] This study show that, pleural fluid protein level was determined in 120 patients. Mean protein level was <3 gm/dl in patient with para-pneumonia, malignant, CCF and Renal disease whereas >3 gm/dl was observed in patients with tubercular effusion. Similar to other which is similar to that found in our study which showed that mean lymphocyte count was 87.61 and 70.74 percentage for tubercular effusion and malignant effusion respectively. Pleural fluid protein level is higher >3gm/dl among patients with exudative effusion like tubercular effusion and para-pneumonic effusion where as it is low in transudative effusion like congestive cardiac failure, a fact confirmed by our study. [4-6] This study show that, ADA level in pleural fluid was analyzed in 120 patients, only patient with tubercular pleural effusion show raised level of ADA (>40U/L). Mean value of ADA for tubercular effusion was 45.8 U/L. Similar to other pleural fluid ADA level predicts tuberculous pleuritis with a sensitivity of 90 to 100% and a specificity of 89 to 100%.The reported cutoff value for ADA varies from 47 to 60 U/L. In our lab exudative effusion is strongly suspected if pleural fluid ADA level is above 60 U/L. mean value of ADA in tuberculous effusion is found 181.37 U/L in our study. However ADA may be falsely positive in few conditions. In our study also few cases of malignant pleural effusion had significant ADA level.[17-19]

CONCLUSION

Our study concluded that the most common cause of unilateral pleural effusion is tuberculosis followed by para-pneumonic effusion and most cases of those belong to younger adults age group (41 -50yrs) and most common cause of bilateral pleural effusion is congestive cardiac failure.Our study concluded that shortness of breath, cough, and pleural fluid analysis is the diagnostic method to distinguish exudative from transudative pleural effusion. Lymphocyte rich exudative effusion occurs in case of Tubercular effusion and neutrophil rich effusion occurs in para-pneumonic effusion. Pleural fluid protein rises in patient with tubercular and para-pneumonic effusion whereas its level decreasing in patient with liver disease and renal disease. High ADA concentration is highly sensitive diagnostic test in Tubercular effusion.

Conflict of interest: None.

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