

Clinical profile of patients admitted with pericardial effusion in Shahid Gangalal National Heart Centre, Kathmandu, Nepal

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Abstract

Background and Aims: Pericardial effusion is a common finding in every day clinical practice. It is caused by a range of local and systemic disorders, many of which could be idiopathic. Pericardial effusions can be acute or chronic. The etiology of pericardial effusion varies in different parts of the world and is related to the relative prevalence of different diseases.

Methods: This is a retrospective study where data from all the cases admitted with pericardial effusion in the SGNHC from January 2021 to December 2022 were included. Altogether 218 cases diagnosed with pericardial effusion established by Echocardiography were included. Evaluation for the cause of pericardial effusion was done. Iatrogenic (cardiac surgery, catheterization) and post-traumatic cases and age <15 years were excluded. Demographic profile, common causes, the presentation and the clinical outcome of the patients were documented.

Results: Majority of patients were aged between 56-75 years. Most common etiology of pericardial effusion was tuberculosis (56%) followed by heart failure (11%), Hypothyroidism (6.4%) and malignancy (5.6%). Tachycardia was the most common ECG finding in 152 (69.7%) followed by Low voltage ECG in 96 (44%). The most common clinical feature was breathlessness in 85% followed by tachycardia in 56% of the patient.

Conclusion: Tuberculosis, Heart Failure and Hypothyroidism were the common causes of Pericardial effusion with male predominance. Breathlessness was the most common presenting symptom.

Keywords: Pericardial effusion, Echocardiography, Tuberculosis, Pericardiocentesis

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Introduction

Pericardial effusion is one of the common diseases presenting in emergency and outpatient departments of a tertiary care center. The etiology of pericardial effusion varies in different parts of the world and is related to the relative prevalence of different diseases¹.

It is caused by a variety of local and systemic disorders, or may be idiopathic. Pericardial effusions can be acute or chronic. The cause of abnormal fluid production depends on the underlying etiology, transudative fluids result from obstruction to fluid drainage, which occurs through lymphatic channels.^{2,3} Exudative effusion occurs secondary to inflammatory, infectious, malignant or autoimmune processes within the pericardium^{2,3}. Pericardial effusion can cause significant symptoms and diminished quality of life, but more importantly, is associated with increased risk of cardio respiratory failure, mortality and death. Clinical manifestations of pericardial effusion are highly dependent on the rate of accumulation of fluid in the pericardial sac. Rapid accumulation of pericardial fluid may cause elevated intrapericardial pressures with as little as 80 ml of fluid, while as slowly progressing effusions can accumulate up to 2 liters without symptoms^{4,5}.

The most common causes of pericardial effusion are infectious/idiopathic pericarditis, malignancy, renal failure and collagen vascular disease. The echocardiogram is the most available and reliable technique in order to verify the presence and the amount of a pericardial effusion; in addition, the echocardiogram offers valuable data for evaluation of hemodynamic repercussion. Small effusions (50 to 100 mL) are only seen posteriorly, typically less than 10 mm in thickness, and only cause minimal separation between the epicardial (visceral) pericardium and the thicker parietal pericardial sac. Moderate effusions (100 to 500 mL) tend to be seen along the length of the posterior wall but not anteriorly; the echo-free space is 10 to 20 mm at its greatest width. Large effusions (>500 mL) tend to be seen circumferentially; the echo-free space is greater than 20 mm at its greatest width.⁶ In developing countries like ours, different studies have shown the most common cause to be tuberculosis or infective. However, there is paucity of data derived from studies with large sample size.

Methods

This is a retrospective study where data from all the cases admitted with pericardial effusion in the Shahid Gangalal National Heart Centre from January 2021 to December 2022 were included.

Altogether 218 cases diagnosed with pericardial effusion were established by Echocardiography defined as echo free space of pericardial fluid.⁶

Evaluation for the cause of pericardial effusion included complete blood count with ESR, Blood urea, serum creatinine, Chest X-ray, ECG, Thyroid profile, CT chest / MRI if required. Pericardial fluid were analysed for cells, proteins, LDH, malignant cells, ADA, PCR (for mycobacterium tuberculosis), gram staining, AFB staining and cultures. Demographic profile, etiology, the clinical presentation and the clinical outcome including resolution and recurrence of fluid, and progression to constrictive pericarditis of the patients were documented. The diagnosis was based on the clinical picture, and negative screening tests for other etiologies. Therapeutic Fluoro-guided percutaneous pericardiocentesis was performed by placing pigtail catheter in pericardial space through subxiphoid approach for patients in large pericardial effusion with or without tamponade. Iatrogenic (cardiac surgery, catheterization) and post-traumatic cases and age <15 years were excluded.

Results

This study included 218 patients with age ranging from 15 to 81 years, majority of patients were aged between 56-75 years (n=86, 39.5%). Only 28 patients 12.8% admitted with pericardial effusion of the age group between less than 25 years. One Hundred twelve patients (51.04%) were male and 106 patients (48.6%) were female. One hundred fifty-six patients 71.6 % belonged to middle socioeconomic status while 22 (10.1%) belonged to poor group. The average number of hospital day was 6.78 days (Range 1-23 days).

The most common presenting complaint was breathlessness in 186 (85.3%) patients followed by chest pain and cough. 22 (10.1 %) patients had fever as presented in figure 1. The duration of symptom varied from 1 day to as long as 4 months. The most common duration was 7 days with mean of 10 days.

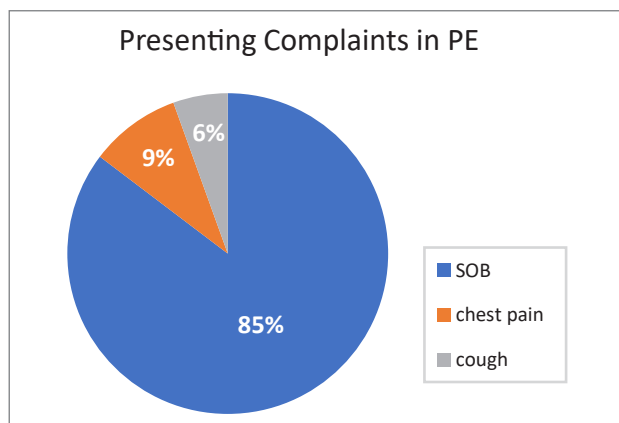


Figure 1: Presenting Complaint of patients

Clinically, patient presented with hypotension in 14 (6.4%), Normotension in 190 (87.2%) and hypertensive in 14 (6.4%). 122 (56%) patients presented with tachycardia. 190 (87.2%) patients were tachypneic at presentation. Only 22 (10.1%) patients presented with fever. 125 (57.3%) patients presented with raised Jugular Venous Pressure.

The ECG was normal in 52 (23.9%) of the patients. Tachycardia (Heart Rate >100bpm) was the most common ECG finding in 152 (69.7%) followed by Low voltage ECG in 96 (44%) and electrical alternans in 82 (37.6%). 82 (37.6%) patients had all three findings; Tachycardia, Low Voltage ECG and Electrical alternans. (Table 1)

Table 1: ECG findings in Pericardial Effusion

	Frequency	Percent
Normal	52	23.9
Tachycardia	152	69.7
low voltage	96	44
Electrical Alternans	82	37.6
Total	218	100.0

Table 2 shows Most Patients 90 (41.3%) presented with large Pericardial effusion not in tamponade whereas 68 (31.2%) presented with large pericardial effusion in tamponade as evidenced in echo screening and chest x-ray. Fifty-two (23.9%) patients had moderate pericardial effusion whereas 8 (3.7%) had small pericardial effusion. Twenty-Two (10%) patients had fibrin strands in Echo finding. Twenty percent (43) patients had concomitant pleural effusion as evidenced by Chest X Ray.

Table 2: Pericardial Effusion Quantity

Amount of fluid	Frequency	Percent
small	8	3.7
moderate	52	23.9
large	90	41.3
large in tamponade	68	31.2
Total	218	100.0

One Hundred Twenty-eight (58.7%) patients did not have any significant past medical history. Fourteen (6.4%) patients had recurrent Pericardial Effusion. Ten patients each had history of TB, Rheumatic Heart Disease and Severe TR with RV dysfunction. Other significant past medical history included Malignancy (3.7%), DCM (3.7%), Hypothyroidism (2.8%) and CKD (2.8%).

A total of 116 (53.2%) patients underwent pericardiocentesis. 92 (42.2%) patients were treated medically. Four (1.8%) patients were taken for pericardial window whereas Six patients underwent pericardiocentesis followed by pericardial window due to persistence of pericardial fluid.

Sixty-Two (28.4%) patients had concomitant anemia probably due to the ongoing systemic illness and heart failure.

Among 122 patients who underwent pericardiocentesis, the average amount of fluid drained was 750 ml (Range 250-1500ml). Seventy patients 57.3% had straw colored fluid while 50 patients (41%) had hemorrhagic fluid as shown in table 3.

Table 3: Fluid Color

Fluid Color	Frequency	Percent
straw	70	57.3
hemorrhagic	50	41.0
pyogenic	2	1.6
Total	122	100.0

The pericardial fluid investigations report were inconsistent. The Total count report ranges from 100 to 59000 with a mean value of 5539±12075. The Differential count showed the varied data. In our study, 21.3 % patients had neutrophilic predominance whereas the rest 78.7% had lymphocyte predominance ranging from 55% to 95%. ADA was also used as a diagnostic marker. As a cutoff 40U/L was used to diagnose Tubercular pericardial effusion. Those patient with

Lymphocyte predominance and/or elevated ADA were presumed to be tubercular in origin and treated accordingly. The Mean ESR and CRP was 32 ± 11 and 1.75 ± 0.6 respectively. There weren't any positive Cytology, PCR and Gene Xpert results probably due to low yield. However, the final decision to start ATT and steroids was based on treating physicians including clinical features and above mentioned parameters.

Few patients underwent CT chest and abdomen to find out the cause of pericardial effusion. Seven (7) patients were found to have malignancy (lymphoma, thymoma) whereas three patients were found to have disseminated TB and were treated accordingly.

Figure 2 shows, 122 (56%) patients were treated as Tuberculosis whereas 24 (11%) patients were treated as heart failure. 14 (6.4%) had hypothyroidism as cause of Pericardial effusion. Other causes included Malignancy, Covid Pneumonia, Pericarditis, CKD, CCP, and post surgical (AVR, MVR).

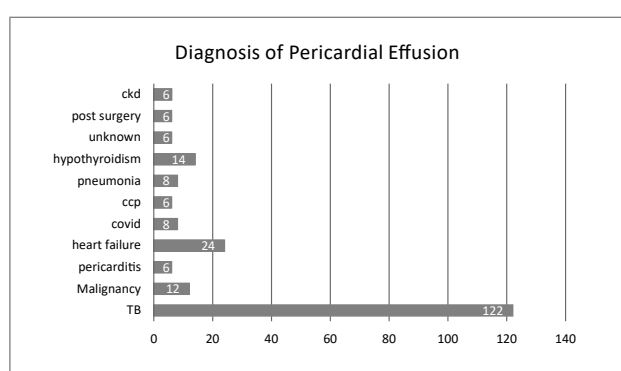


Figure 2: Diagnosis of Pericardial Effusion

One hundred ninety-four (89%) patients improved and were discharged with oral medications. 18 (8.3%) patients were referred for further evaluation and management in line of malignancy and CKD. 6 patients (2.8%) patients developed CCP in follow up. As such there were not any mortality amongst the study group.

Discussion

The causes of pericardial effusion varies with age. The most common age group in our study was 56-75 which is similar to study done by Uddin M., et al⁷.

In our study, 90 (41.3%) presented with large Pericardial effusion not in tamponade whereas 68 (31.2%) presented with large pericardial effusion in tamponade similar to study by Sagristá-Sauleda et al⁸ who included 322 patients, 132 with moderate and 190 with large pericardial effusion. Khanal, R. et al⁹ studied 63 patients, 10 patients (15.8%) presented with moderate pericardial effusion; 53 patients (84%) presented with large pericardial effusion.

In study done by Uddin M., et al⁷, the most common clinical feature was tachycardia (69.69%), followed by breathlessness (60.60%) and fever in (54%) of patients. Similar to the study, the most common presenting symptom in our study was breathlessness in 85% followed by tachycardia in 56% of the patient. Study done by Khanal, R. et al⁹ showed most common clinical feature shortness of breath (95%) followed by tachycardia (63.4%).

The causes of pericardial effusion varies over different studies over place and time. In our study, the most common cause was tuberculosis (56%) followed by heart failure (11%), Hypothyroidism (6.4%) and malignancy (5.6%). Similar to our study, the commonest cause of pericardial effusion in study done by Uddin M., et al⁷, was infectious, Tubercular 18 patients (27.27%), idiopathic/viral

13 patients (19.69%), but Neoplastic cause 13.63%. Khanal, R. et al⁹ also reported most common etiology to be tuberculosis (36.5%) followed by malignancy (19%) and idiopathic/Viral (12.6%). Bista, M et al.¹⁰ and Ahmed Wani, O. et al.¹¹ also reported Tuberculosis to be the major cause of Pericardial effusion. The second most common cause was heart failure. This could be due to this study being done in a cardiac centre.

Contrary to our results, study done by Corey et al¹², the most common diagnoses were malignancy (23%), viral infection (14%), radiation-induced inflammation (14%), collagen-vascular disease (12%) and uremia (12%).

In Posner's series¹³, malignant pericardial disease was diagnosed in 18 (58%) of 31 patients with underlying cancer and pericarditis, while 32% of the patients had idiopathic pericarditis and 10% had radiation induced pericarditis.

Sixty-Two (28.4%) patients had concomitant anemia probably due to the ongoing systemic illness and heart failure.

The differences in the cause could be related to the occupation, workplace and the prevalence of the disease entity. As a developing country and high prevalence of Tuberculosis, the prevalence of Tuberculosis in our part of the world still remains a big issue.

Limitations

This is a single center, retrospective study. Our patients may not be representative of the general population due to selection bias.

Conclusion

Tuberculosis, Heart Failure and Hypothyroidism were the common causes of Pericardial effusion with male predominance. Breathlessness was the most common presenting symptom. Based on the clinical features and investigations like ECG, Chest Xray and Echocardiogram, early diagnosis and prompt treatment of patients with pericardial effusion can be done. More detailed epidemiologic studies are required to improve understanding of the burden of pericardial effusion.

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Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

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