Int. J Med. Pharm. Res. (P-ISSN: 2958-3675 | E-ISSN: 2958-3683)
Available on: https://ijmpr.in/

International Journal
of Medical and Pharmaceutical Research

ORGINAL ARTICLE **OPEN ACCESS**

A retrospective study of Clinical profile and outcome of patients admitted with pericardial effusion

Mohammad Al Mamun[1], Nilufar Fatema[2], Mohammod Zafor Iqbal Jamali[3], A. K. Al Miraj[4], Naveen sheikh[5], Fouzia sultana[6]

[1]Medical Officer, Department of cardiology, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh.
[2]Consultant, Department of cardiology, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh
[3]Medical Officer, Department of cardiology, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh
[4]Research Assistant, Department of Vascular Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh
[5]Associate Professor, Department of Cardiology, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh
[6]Medical Officer, Department of ENT, National Institute of ENT Hospital Tejgao, Dhaka, Bangladesh

OPEN ACCESS

***Corresponding Author**
Mohammad Al Mamun,
Medical Officer, Department of cardiology, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh.

Received: 10-11-2022
Accepted: 20-12-2022
Available online: 25-12-2022

A B S T R A C T

Backgroundand Aims: 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. The etiology of pericardial effusion varies in different parts of the world and is related to the relative prevalence of different diseases. It is caused by a variety of local and systemic disorders, or maybe idiopathic. 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 Department of Cardiology July 2021 August 2022at BSM Medical University Hospital were included. Altogether 110 cases diagnosed with pericardial effusion established y Echocardiograpy 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:** This study included 110 patients with age ranging from 15 to 81 years, majority of patients ware aged between 56-75 years (n=44, 40%). Only 14 patients 12.7% admitted with pericardial effusion of the age group between less than 25 years. 57 (51.8%) were male and 53 patients (48.26%) were female. 78 (70.9%) belonged to middle socioeconomic status while11(10%) belonged to poor group. The average number of hospital day was 6.78 days (Range 1-23 days). Most common etiology of pericardial effusion was tuberculosis (56.3%) followed by heart failure (10.9%), Hypothyroidism (6.3%) and malignancy (5.4%). Tachycardia was the most common ECGfindingin77(70%) followed by Low voltage ECG in48 (43.6%). The most common clinical feature was breath lessness in 84.5% followed by tachycardia in 56.3% 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.

INTRODUCTION

Pericardial effusion can lead to significant symptoms and poor quality of life, but this is even more important and is associated with a failed response, mortality rate, and increased risk of heart death. The pathogenesis of psychological exudates differs in different regions of the world and is associated with the relative prevalence of different diseases [1]. It is caused by a variety of local and systemic disorders, or maybe 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]. Diagnosing pericardial effusion clinically may not always

be possible, particularly when signs of hemodynamic compromise are not present [3]. Therefore, a high suspicion index must be maintained as delays in diagnosis and treatment and treatment lead to higher mortality [4]. Exudative exudates are secondary to inflammatory, infectious, malignant, or autoimmune processes [4,5]. The clinical symptoms of Pericard exudate are heavily dependent on the accumulation of liquids in Pericard bags. Rapid accumulation of pericardial fluid can lead to increased subcutaneous presses when only 80 ml of fluid is present, but slow, progressive drainage can accumulate up to 2 liters without symptoms [6,7]. The most common causes of pericardial casting are infectious/idiopathic pericarditis, malignant tumors, renal failure, and collagen vessels. Echocardiography is the most available and reliable technique for checking presence and pericardium volume. Furthermore, echocardiograms provide valuable data to assess hemodynamic effects. Small exudates (50-100 mL) can usually only be seen thicknesses below 10 mm, with minimal separation between the pericardium (visceral) pericardium and the thick parietal pericardium sac It only causes [8]. Moderate effusions (100 to 500 mL) tend to be seen along the length of the posterior wall but not anteriorly; the echo-free spaceis 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 [9]. 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 Department of Cardiology July 2021 August 2022 at BSM Medical University Hospital were included wereincluded. Altogether 110 cases diagnosed with pericardial effusion were established by Echocardiograpy defined as echo free space of pericardial fluid [6].

Evaluation for the cause of pericardial effusion included complete blood count with ESR, Bloodurea, 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 percutenaous 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 110 patients with age ranging from15 to 81 years, majority of patients ware aged between 56-75 years (n=44, 40%). Only 14 patients 12.7% admitted with pericardial effusion of the age group between less than 25 years. 57 (51.8%) were male and 53 patients (48.26%) were female. 78(70.9%) belonged to middle socioeconomic status while 11(10%) 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 93 (84.5%)patients followed by chest pain and cough.11(10%) patients had fevera spresented in figure1. The duration of symptom varied from 1 day to aslongas 4 months. The most common duration was 7 days with mean of 10 days.

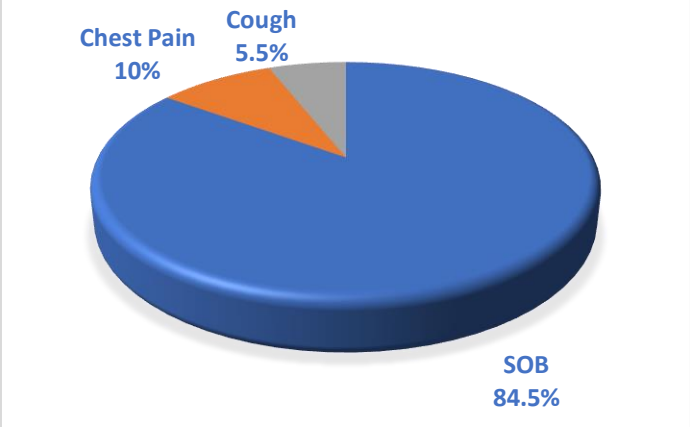

Figure 1: Presenting Complaint of patients

Clinically, patient presented with hypotension in 7 (6.4%), Normotensionin 96(87.2%) and hypertensivein7(6.4%).122 (56%) patients presented with tachycardia. 190 (87.2%) patients were tachypneic at presentation. Only11 (10%) patients presented with fever. 63 (57.3%) patients presented with raised Jugular Venous Pressure.

The ECG was normalin 52 (47.2%) of the patients. Tachycardia (Heart Rate >100bpm) was the most common ECG finding in 76 (69.1%) followed by Low voltage ECG in 4896 (43.6%) and electrical alternans in 41 (37.26%). 41 (37.26%) 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	47.2
Tachycardia	76	69.1
lowvoltage	48	43.6
ElectricalAlternans	41	37.2

Table 2 shows Most Patients 46 (41.8%) presented with large Pericardial effusion not in tamponade whereas 34(30.9%) presented with large pericardial effusion in tamponade as evidenced in echo screening and chest x-ray. 26 (23.6%) patients had moderate pericardial effusion whereas 4(3.6%) had small pericardial effusion. 11 (10%) patients had fibrin strands in Echo finding. Twenty percent (43) patients had concomitant pleural effusion as evidenced by Chest X Ray.

Table2: Pericardial Effusion Quantity

Amount of fluid	**Frequency**	**Percent**
small	4	3.6
moderate	26	23.6
large	46	41.8
largein tamponade	34	30.9
Total	110	100.0

64(58.2%) patients did not have any significant past medical history. 7 (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 (3.6%), DCM (3.6%), Hypothyroidism (2.7%) and CKD (2.7%).

A total of 58 (53.7%) patients underwent pericardiocentesis. 46 (41.8%) patients were treated medically. 2(1.8%) patients were taken for pericardial window whereas 3 patients underwent pericardiocentesis followed by pericardial window due to persistence of pericardial fluid. 31(28.2%) patients had concomitant anemia probably due to the ongoing systemic illness and heart failure.

Among 60 patients who underwent pericardiocentesis, the average amount of fluid drained was 750 ml (Range 250-1500ml). Seventy patients 556.67.3% had straw colored fluid while 25patients (41.6%) had hemorrhagic fluid as shown in table 3.

Table3: Fluid Color

FluidColor	**Frequency**	**Percent**
straw	34	56.6
hemorrhagic	25	41.6
pyogenic	1	1.6
Total	60	100.0

The pericardial fluid investigations report were in consistent. 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%to95%. 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 X pert results probably due to low yield. How ever, 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.

DISCUSSION

Pericardial effusion is the buildup of extra fluid in the space around the heart. If too much fluid builds up, it can put pressure on the heart. This can prevent it from pumping normally. A fibrous sac called the pericardium surrounds the heart. Pericardial effusion can develop in patients with any condition that affects the pericardium including acute pericarditis and a variety of systemic disorders. The effusion may or may not be associated with pericarditis. The etiology of pericardial effusion has changed over time and varies depending on geography and the population [10]. There is diversity in clinical etiology of pericardial effusion which includes malignancies of other organs, pulmonary tuberculosis, chronic renal failure, thyroid disease, autoimmune disease, iatrogenic and idiopathic. The development of a pericardial effusion may have important implications for the prognosis (as in patients with intra thoracic malignancy) or diagnosis (as in myopericarditis or acute pericarditis) or both (as in dissection of the ascending aorta). The causes of pericardial effusion varies with age. The most commonagegroupinourstudywas56-75whichissimilartostudy done by Uddin M., et al [11].In our study,45 (40.9%)

presented with large Pericardial effusion not in tamponade whereas 34 (30.9%) presented with large pericardial effusion in tamponade similar to study by Agrawal Detal [12] who included 166 patients, 66 with moderate and 95 with large pericardial effusion. Khanal, R. etal [13] studied 32 patients, 5 patients (15.6%) presented with moderate pericardial effusion;28 patients (87.5%) presented with large pericardial effusion. In study done by Uddin M., et al [11], 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 al [13] showed most common clinical features hortness 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 al [11], was infectious, Tubercular 18 patients (27.27%), idiopathic/viral 13 patients (19.69%), but Neoplastic cause 13.63%. Khanal, R. et al [13] also reported most common etiology to be tuberculosis (36.5%) followed by malignancy (19%) and idiopathic/Viral (12.6%). Bista, MB et al. [14] and Wani AA. Et al. [15] 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 L et al [16], the most common diagnoses were malignancy (23%), viral infection (14%), radiation–induced inflammation (14%), collagen-vascular disease (12%) and uremia (12%) [17].In Posner's series 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, work place and the prevalence of the diseasentity [18]. As a developing country and high prevalence of Tuberculosis, the prevalence of Tuberculosis in our part of the world still remains a big issue. When a pericardial effusion is initially or incidentally detected, a major concern for clinicians may be its etiology. In a majority of cases, the etiology of the effusion can be presumed from the underlying condition of the patient. Pericardiocentesis is only indicated when the effusion is large or symptomatic, the effusion is accompanied by tamponade or the cause of the effusion is questionable.

CONCLUSION

The idiopathic pericardial effusion should be diagnosed only after a thorough evaluation of possible underlying causes. Urgent pericardiocentesis should be done whenever there is actual or threatened tamponade and may prove lifesaving. 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.

Funding: No funding sources

Conflict of interest: None declared

REFERENCES

1. Vakamudi S, HoN,Cremer PC.Pericardial Effusions: Causes, Diagnosis, and Management. Prog Cardiovasc Dis. 2017 Jan- Feb;59(4):380-388.
2. Chandraratna PA, Mohar DS, Sidarous PF. Role of echocardiography in the treatment of cardiac tamponade. Echocardiography. 2014 Aug;31(7):899-910.
3. Pepi M, Muratori M. Echocardiography in the diagnosis and management of pericardial disease. J Cardiovasc Med (Hagerstown). 2006 Jul;7(7):533-44.
4. Uddin, M., Singh, M., & Mehdi, M. Study of etiological and clinical profile of pericardial effusion in a tertiary care hospital in kosi region of Bihar, India. Int J Adv Med 2016; 3:514-8.
5. Sagristà-Sauleda J, MercéJ, Permanyer-Miralda G, Soler-Soler J. Clinical clues to the causes of large pericardial effusions. Am JMed.2000;109:95-101.
6. Khanal, R., Gajurel, R., Sahi, R., Shrestha, H., Poudel, C., Devkota, S. , Thapa, S. and Shakya, S. Study of Etiological Profile, Clinical Profile and Short Term Outcome of Patients Presenting with Pericardial Effusionina Tertiary Care Center, Nepal. World Journal of Cardiovascular Diseases,2019;9:879- 890.
7. Bista M, Nepal R, Katwal S, Thakur MK, Clinical Characteristics of patients with Pericardial Effusion, JoNMC. 2021;10(1):16-19.
8. Corey GR, Campbell PT, Van Trigt P,Kenney RT,O' Connor CM, Sheikh KH, Kisslo JA, Wall TC. Etiology of large pericardial effusions. Am J Med 1993; 95:209-13.
9. Posner MR, Cohen GI, Skarin AT. Pericardial disease in patients with cancer. The differentiation of malignant from idiopathic and radiation-induced pericarditis. Am JMed.1981; 71:407-13.

10. Leiter LA, Rosenson RS, Stein E Et al. Efficacy and safety of rosuvastatin 40 mg versus atorvastatin 80 mg in high-risk patients with hypercholesterolemia: results of the POLARIS study. Atherosclerosis. 2007; 194(2), e154–e164.
11. Uddin M, Zakeel MC, Zavahir JS, Marikar FM, Jahan I. Heavy metal accumulation in rice and aquatic plants used as human food: A general review. Toxics. 2021 Dec 20;9(12):360.
12. Agrawal D, Manchanda SC, Sawhney JPS et al. To study the effect of high dose Atorvastatin 40 mg versus 80 mg in patients with dyslipidemia. Indian Heart J. 2018; 70(Suppl. 3), S8–S12.
13. Khanal R, Lei C. Solar chimney—A passive strategy for natural ventilation. Energy and Buildings. 2011 Aug 1;43(8):1811-9.
14. Bista MB, Banerjee MK, Shin SH, Tandan JB, Kim MH, Sohn YM, Ohrr HC, Tang JL, Halstead SB. Efficacy of single-dose SA 14–14–2 vaccine against Japanese encephalitis: a case control study. The Lancet. 2001 Sep 8;358(9284):791-5.
15. Wani AA, Singh P, Shah MA, Schweiggert-Weisz U, Gul K, Wani IA. Rice starch diversity: Effects on structural, morphological, thermal, and physicochemical properties—A review. Comprehensive reviews in food science and food safety. 2012 Sep;11(5):417-36.
16. Corey L, Spear PG. Infections with herpes simplex viruses. New England Journal of Medicine. 1986 Mar 13;314(11):686-91.
17. Aydin MU, Aygul N, Altunkeser BB, Unlu A, Taner A. Comparative effects of high-dose atorvastatin versus moderate-dose rosuvastatin on lipid parameters, oxidized-LDL and inflammatory markers in ST elevation myocardial infarction. Atherosclerosis. 2015; 239(2), 439–443.
18. De Zeeuw D, Anzalone DA, Cain VA et al. Renal effects of atorvastatin and rosuvastatin in patients with diabetes who have progressive renal disease (PLANET I): a randomised clinical trial. Lancet Diabetes Endocrinol. 2015; 3(3), 181–190.