Section: Medicine

Research

STUDY OF ETIOLOGICAL, AND CLINICAL PROFILE OUTCOME OF PATIENTS, WITH PERICARDIAL EFFUSION IN A BKL WALAWALKAR RURAL MEDICAL COLLEGE DERVAN, MAHARASHTRA

Sushant Sunil Desale[1], Smriti Yogesh Sharma[2], Chandreshkumar Khengarbhai Chaudhary[3], Sachin Gopinathrao Surnar[4]

[1]JR III, Department of General Medicine, BKL Walawalkar Medical College, Sawarde, Chiplun, Ratnagiri, Maharashtra, India.
[2]JR III, Department of General Medicine, BKL Walawalkar Medical College, Sawarde, Chiplun, Ratnagiri, Maharashtra, India.
[3]JR III, Department of General Medicine, BKL Walawalkar Medical College, Sawarde, Chiplun, Ratnagiri, Maharashtra, India.
[4]JR III, Department of General Medicine, BKL Walawalkar Medical College, Sawarde, Chiplun, Ratnagiri, Maharashtra, India.

Received : 15/10/2022
Received in revised form : 22/11/2022
Accepted : 06/12/2022

Keywords:
Malignancy, Pericardial Effusion, Pericardiocenthsis, Tuberculosis (T.B).

Corresponding Author:
Dr. Sachin Gopinathrao Surnar,
Email: sachinsurnar7@gmail.com
ORCID: 0000-0002-9612-1354

DOI: 10.47009/jamp.2022.4.5.160

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2022; 4 (5); 772-776

Abstract

Background: Pericardial effusion is one of the common cardiac problems in our part of the world and adds burden to the health and economy of the country, as it is associated with high risk of morbidity and mortality. Our objective of the study was to determine the etiological spectrum of pericardial effusion, their clinical presentations and complications and assessing the usefulness of echocardiographic features of effusion in helping to determine the etiology. **Materials and Methods:** A cross-sectional observational prospective study of 30 patients with diagnosis of pericardial effusion was enrolled in the study. Pericardial effusion was diagnosed by echocardiography and pericardiocentesis was done in the cardiac catheterization room. Patients were followed up 3 monthly for 1 year and reassessed clinically and by echocardiography. **Result:** Patients presenting with pericardial effusion belonged to the age group of 8 to 88 years. The most common etiology was tuberculosis (50%) followed by malignancy (23%) and idiopathic/Viral (10%). Among malignancies, carcinoma lung was the most common cause followed by Carcinoma Breast. Pericardiocentesis was done the approach was subxiphoid. The total mortality was 2 (6.66%). **Conclusion:** The study showed tuberculosis as the most common cause of pericardial effusion in developing countries and as a cause of cardiac tamponade in contrast to the studies from the developed world where malignancy remains the leading cause.

INTRODUCTION

The pericardium is a double-walled sac composed of two different layers an outer fibrous parietal pericardium and an inner visceral pericardium. The inner visceral pericardium is located immediately outside of the myocardium.

Pericardial cavity which is in between the parietal and visceral pericardium is filled with 10cc - 50 cc of fluid an ultra-filtrate of plasma that is produced by the visceral pericardium. Pericardial fluid acts as a lubricant between the heart and the pericardium. Pericardial effusion is termed when there is excess fluid or blood accumulation in the pericardial cavity.[1]

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.[2]

There is diversity in clinical etiology of pericardial effusion which includes ma- lignancies of other organs, pulmonary tuberculosis, chronic renal failure, thyroid disease, autoimmune disease, iatrogenic and idiopathic.[3]

The accumulation of fluid in the pericardial space in a quantity sufficient to cause serious obstruction of inflow of blood into then ventricles results in cardic tamponade. This complication may be fatal if it is not recognized and treated promptely. The three principal features of tamponade (Beck's traid) are hypotension, soft or absent heart sounds and jugular

ISSN (O): 2687-5365; ISSN (P): 2753-6556

venous distention with prominent X (early systolic descent but absent Y (early diastolic) descent.[4]
The Limitations to ventricular filling are responsible for reduction of cardiac output and arterial pressure. The quantity of fluid necessary to produce cardiac tamponade may be as small as 200ml.

MATERIALS AND METHODS

A cross-sectional observational prospective study was done at BKL Walawalkar Rural Medical College, Dervan, Maharashtra a Tertiary Care Center. 30 patients were evaluated at our hospital, over a period of one year.
Data were collected including history, general and full cardiovascular assessments. Investigations included electrocardiogram, chest roentgenogram and echocardiography for all patients. The inclusion and exclusion criteria were as follows.

Inclusion Criteria
Moderate to large pericardial effusion with and without cardiac tamponade.
Mild or loculated pericardial effusion with tamponade.

Exclusion Criteria
Mild pericardial effusion < 10 mm in absence of cardiac tamponade.
The diagnosis of pericardial effusion was established by echocardiography, seen as echo-free space surrounding the heart. The size of the Effusion was categorized by measuring the fluid strip as small when it is less than 10 mm, moderate-sized when it is 10 to 20 mm and large when it is more than 20 mm. Effusion measuring less than 10 mm in absence of tamponade was not included.
Evaluation for the cause of PE included complete blood count with ESR, Blood urea, serum creatinine, tuberculin skin test, chest X ray, Gene Experet, Thyroid profile, ANA, Rheumatoid factor, CT chest /MRI and pericardiocentesis.
Pericardial fluid was analyzed for cells, proteins, LDH, malignant cells, ADA, PCR (for mycobacterium tuberculosis), gram staining, AFB staining and cultures. Final diagnosis was based on clinical history, examination, and specific laboratory investigations for tuberculosis, uraemia, malignancy, collagen vascular disease hypothyroidism, etc. The diagnosis of acute idiopathic/viral etiology was presumptive and was based on the clinical picture, and negative screening tests for other etiologies.
Therapeutic Echo-guided percutenaous pericardiocentesis was performed by placing pigtail catheter in pericardial space through subxiphoid approach.

Follow up
All patients were followed up after 1 month and then 3 monthly for one year.

The study was approved by our own institutional ethics committee and signed informed consent was taken from all patients before enrolment in this study.

RESULTS

The study included 30 patients with age ranging from 8 to 88 years. 12 patients (42.2 percent) were female and 18 (58.7 percent) were male.
The most common clinical feature was shortness of breath (93.3%) followed by tachycardia (63.4%). The least common clinical feature was palpitation (10%) [Table 1].
Out of 30 patients, 5 patients (16.66%) presented with moderate pericardial effusion; 26 patients (86%) presented with large pericardial effusion.
A total of 19 patients (63.33%) had echocardiographic as well as clinical evidence of cardiac tamponade [Table 1]. There was no any patient with mild/ loculated effusion with tamponade.
The most common etiology of pericardial effusion was tuberculosis (n = 15; 50%) followed by malignancy (n = 07; 23%), acute idiopathic/viral (n = 3;10%) [Table 2].
Among malignancies, carcinoma lung was the most common (n=3), followed by carcinoma breast (n=2) [Table 3]. Tuberculosis was the most common cause in patients presenting with tamponade (n = 10; 50%) followed by malignancy (n =08; 40%) [Table 4].
The arrhythmia associated with pericardial effusion was in 4 patients (13.33%) and the most common arrhythmia was AF [Table 5].

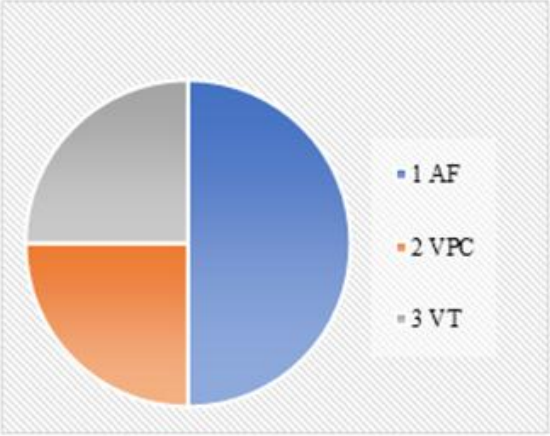

Figure 1: Different arrhythmia associated with pericardial effusion

All 30 patients who had undergone peri-cardiocentesis. Pericardectomy was done in 2 patients, one with purulent effusion and one with chronic constrictive pericarditis.
The procedure related complications was in 4 patients which were vasovagal response with transient hypotension, subcutaneous emphysema and supraventricular tachycardia. There was no death as a consequence of the procedure.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

The total mortality was 3,1 patient died during hospital stay and 2 patients outside the hospital which was confirmed by phone contact on follow up
The Echo characteristics of the pericardial effusion were helpful to differentiate between the tuberculous, malignant and idiopathic etiologies.
Fibrin strands and thickened fluid were found mainly with tuberculosis whereas shaggy pericardium was associated with tuberculous, idiopathic and bacterial etiologies.
Among 15 tubercular patient, 9 had correct diagnosis and remaining 6 are treated empirically with ATT who responded well.

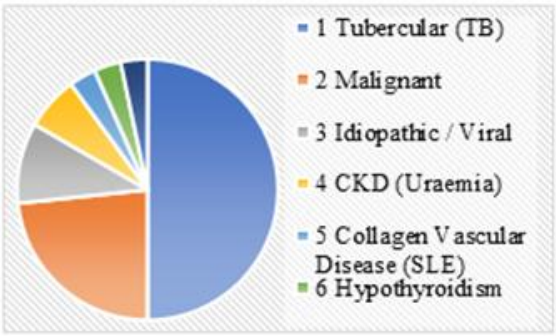

Figure 2: Etiological profile of pericardial effusion.

Follow up

Patients were followed up after 1 month and then 3 monthly for reassessment of pericardial effusion and complications.
24 patients (90%) were followed up. Among the remaining patients, 3 died during first hospital admission and 3 lost to follow up. Recurrence was present in 4 patents (13.33%), repeated pericardiocentesis done in 2, both were Malignant.

Two patients had CP features on first visit, 1 diagnosed with idopathic and other with tuberculosis. Among them, patient diagnosed with TB had normal echocardiography on follow up and was labeled as transient CP while the other patient lost to follow up.

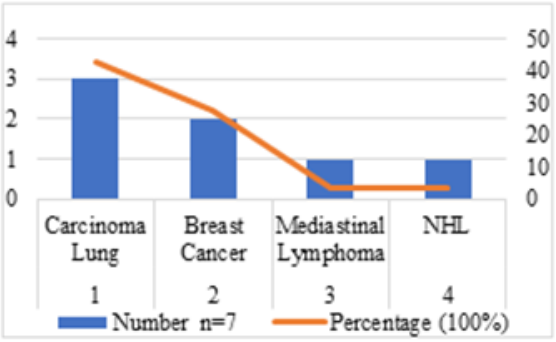

Figure 3: Pattern of malignancy

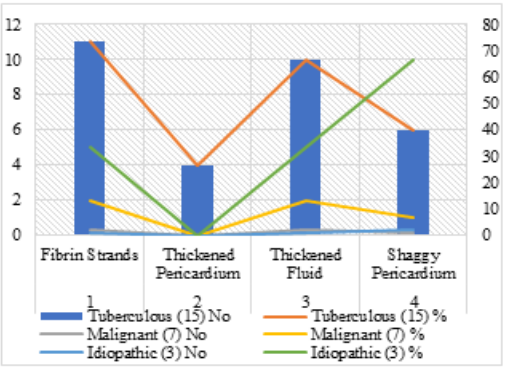

Figure 4: Relationship between the etiology and the Echo features of the effusion

Table 1: Showing demographic, clinical, laboratory characteristics.

Sr No	Clinical, laboratory characteristics.	Number	Percentage (100%)
1	Total no of patients	30	
2	Age range (in years)	8 to 88 Mean: 42.28 ± SD 22.50	
	Females	12	42.2
	Males	18	58.7
3	Symptoms		
	Breathlessness	28	93.3
	Chest Pain	18	60
	Fever	15	50
	Cough	15	50
	Palpitation	3	10
	Other Symptoms	10	33.33
4	Signs		
	Tachycardia	19	63.4
	Bradycardia	1	3.3
	Hypotension	8	26.66
	Raised JVP	9	30
	Pulsus paradoxus	8	26.66
	Muffled Heart sounds	16	53.35
5	Electrical Alternans on ECG	4	13.33
6	Cardiomegaly on CXR	27	90
7	Echocardiography		
	Moderate PE (Pericardial Effusion)	5	16.66
	Large PE (Pericardial Effusion)	26	86
	Cardiac tamponade (Clinical + Echo)	19	63.33

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Table 2: Showing etiological profile of pericardial effusion.

Sr. No	Diagnosis	Number n = 30	Percentage (100%)
1	Tubercular (TB)	15	50
2	Malignant	7	23
3	Idiopathic / Viral	3	10
4	CKD (Uraemia)	2	6.66
5	Collagen Vascular Disease (SLE)	1	3.33
6	Hypothyroidism	1	3.33
7	HIV - Infection	1	3.33

Table 3: Pattern of malignancy associated with pericardial effusion.

Sr. No	Malignancy	Number n=7	Percentage (100%)
1	Carcinoma Lung	3	42.6
2	Breast Cancer	2	28
3	Mediastinal Lymphoma	1	3.33
4	NHL	1	3.33

Table 4: Showing different arrhythmia associated with pericardial effusion.

Sr. No	Arrhythmia	Number n=4	Percentage (100%)
1	AF	2	
2	VPC	1	
3	VT	1	

Table 5: Relationship between the etiology and the Echo features of the effusion.

Sr No	Echo Feature	Tuberculous (15)		Malignant (7)		Idiopathic (3)	
		No	%	No	%	No	%
1	Fibrin Strands	11	73.33	2	13.33	1	33.33
2	Thickened Pericardium	4	26.66	0	0	0	0
3	Thickened Fluid	10	66.66	2	13.33	1	33.33
4	Shaggy Pericardium	6	40	1	6.66	2	66.66

DISCUSSION

Pericardial effusion can occur at any age but age specific etiologies may differ. In our study majority of patients were in age group of 8 to 88 years of age. The commonest symptoms and signs in our patients were breathlessness and tachycardia.

63.4 % patients in our study had clinical and echo evidence of cardiac tamponade. Most common ECG findings of our patients were sinus tachycardia.

In our study the most common cause of pericardial effusion was tuberculosis (50.0%) followed by malignancy (23%) and acute idiopathic/viral (10.0%).

Similarly, in the study conducted by Uddin et al,[5] in India, most common etiology was tuberculosis 27.27% followed by idiopathic 19.69% then Uremia 16.66% and Malignant 13.63%.

In developed countries the result is slightly dissimilar. Corey et al,[6] in United States investigated the etiology of pericardial effusion in 57 patients.

The most common diagnosis were malignancy (23%), viral infection (14%), radiation induced inflammation (14%). In another study conducted in Spain general hospital by Sagristà Sauleda et al,[7] the most common diagnosis was Idiopathic (20%), Neoplastic (13%), Post MI (8%) and less common was tuber cular (2%).

The high frequency of tuberculosis from the above studies reflects the high incidence of tuberculosis in the developing countries like Nepal, India.

Acute idiopathic effusion is considered mostly of viral origin. Testing for specific viruses is not routinely done and in our country it is less commonly done because of cost benefit ratio, low yield, unavailability and less impact on management. So in our study the idiopathic effusion was thought mostly due to viral cause.

Among malignant patients in our study the most common malignancy was lung cancer followed by lymphoma.

In the study conducted by Irfan Yaqoob et al,[8] among malignancies, carci noma lung was the most common followed by breast carcinoma and lymphoma. In our study there was a strong positive correlation between thickened appearance of fluid and tuberculosis (78% sensitivity and 70% specificity).

This was similar to the study conducted by Liu PY, et al,[9] demonstrated that thickened pericardium and fibrin strands were highly specific (94% and 88%, respectively) and exudative coating had a high sensitivity (100%) but low specificity (22%) in the diagnosis of tuberculous pericarditis.

This was similar to the study conducted by Tsang TS et al,[10] where the procedural success rate was 98% and the overall complications rate was 4.7%. In our study patients were followed up after 1 month and then 3 monthly for reassessment of pericardial effusion and complications. 24 patients (90%) were followed up. Among the remaining patients, 3 died during first hospital admission and 3 lost to follow up. Recurrence was present in 4 patents. (13.33%), repeated pericardiocentesis done in 2, both were Malignant.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Two patients had CP features on first visit, 1diagnosed with idiopathic and other with tuberculosis.

Limitation of the Study

The present study had some limitations that need to be considered. The present study did not determine the direct evidence for viral and tuberculous pericardial effusion.

Due to small sample size and short duration of follow up, less number of patients was detected.

Also a long follow up is necessary to compare the results.

CONCLUSION

From this study we observed the various presenting features for pericardial effusion and cardiac tamponade.

The common etiology in our study was tuberculosis followed by malignancy and idiopathic.

The idiopathic pericardial effusion should be diagnosed only after a thorough evaluation of possible underlying causes.

Urgent peri-cardiocentesis should be done whenever there is actual or threatened tamponade and may prove lifesaving.

Purulent pericardial effusion should also be drained even in absence of tamponade. The echocardiography can help in revealing the undiagnosed patients and add up useful information regarding the etiology.

Although small sample size, there was significant echo correlation for different etiology in our study.

The fibrin strands, thickened appearance of fluid and shaggy pericardium were helpful in differentiating tuberculosis from malignancy and idiopathic.

REFERENCES

1. Sagristà-Sauleda J, Mercé AS, Soler-Soler J. Diagnosis and management of pericardial effusion. World J Cardiol. 2011;3(5):135-43. doi: 10.4330/wjc.v3.i5.135.
2. Chang S, Maharaj S. Brief Images: Massive pericardial effusion. Images Paediatr Cardiol. 2014;16(3):1-3.
3. Azarbal A, LeWinter MM. Pericardial Effusion. Cardiol Clin. 2017;35(4):515-524. doi: 10.1016/j.ccl.2017.07.005.
4. Klein AL, Abbara S, Agler DA, Appleton CP, Asher CR, Hoit B, et al. American Society of Echocardiography clinical recommendations for multimodality cardiovascular imaging of patients with pericardial disease: endorsed by the Society for Cardiovascular Magnetic Resonance and Society of Cardiovascular Computed Tomography. J Am Soc Echocardiogr. 2013;26(9):965-1012.e15. doi: 10.1016/j.echo.2013.06.023.
5. Uddin MJ, Singh MP, Mehdi MD. Study of Etiological and Clinical Profile of Pericardial Effusion in a Tertiary Care Hospital in Kosi Region of Bihar. Int J Adv Med. 2016;3:514-518.
6. Corey GR, Campbell PT, Van Trigt P, Kenney RT, O'Connor CM, Sheikh KH, et al. Etiology of large pericardial effusions. Am J Med. 1993;95(2):209-13. doi: 10.1016/0002-9343(93)90262-n.
7. Sagristà-Sauleda J, Mercé J, Permanyer-Miralda G, Soler-Soler J. Clinical clues to the causes of large pericardial effusions. Am J Med. 2000;109(2):95-101. doi: 10.1016/s0002-9343(00)00459-9.
8. Yaqoob I, Khan KA, Beig JR, Bhat IA, Tramboo NA, Hafeez I, et al. Etiological Profile of Pericardial Effusion in Kashmir: A Study from Northern India. International Inv J Med Med Sci, 2016;3(1):1-5.
9. Liu PY, Li YH, Tsai WC, Tsai LM, Chao TH, Yung YJ, et al. Usefulness of echocardiographic intrapericardial abnormalities in the diagnosis of tuberculous pericardial effusion. Am J Cardiol. 2001;87(9):1133-5, A10. doi: 10.1016/s0002-9149(01)01481-3.
10. Tsang TS, Enriquez-Sarano M, Freeman WK, Barnes ME, Sinak LJ, Gersh BJ, et al. Consecutive 1127 therapeutic echocardiographically guided pericardiocenteses: clinical profile, practice patterns, and outcomes spanning 21 years. Mayo Clin Proc. 2002;77(5):429-36. doi: 10.4065/77.5.429.

ISSN (O): 2687-5365; ISSN (P): 2753-6556