DOI: https://doi.org/10.53350/pjmhs211551504

ORIGINAL ARTICLE

Frequency and Causes of Pericardial Effusion in Patients Presenting to Emergency Department with Dyspnea

AMJAD ABRAR[1], FARHAN FAISAL[2], MAHBOOB UR REHMAN[3], AMJAD ALI SHAH[4], MUHAMMAD SHOAIB[5], MALIK ALI RAZA[6]

[1]Associate Professor, Cardiology department, Gomal Medical College Dera Ismail Khan
[2,3]Assistant Professor, Cardiac Centre Pakistan Institute of Medical Sciences, Islamabad
[4]Senior Medical Officer, Cardiology department Saidu Teaching Hospital, Swat
[5,6]Registrar Cardiology Department Pakistan Institute of Medical Sciences, Islamabad
Corresponding author: Dr Mahboob ur Rehman, Email: drmehboobfcps@yahoo.com, Cell: +923339229552

ABSTRACT

Objective: To determine the frequency and causes of pericardial effusion in patients presenting to emergency department with dyspnea.

Study Design: Prospective/Observational study

Place & Duration: Cardiac Centre, Pakistan Institute of Medical Sciences (PIMS),Islamabad for duration of one year from January 2019 to Dec 2019.

Methods: A total 220 patients of both genders with ages above 20 years presented with dyspnea were enrolled in this study. Patients detailed medical history was recorded after taking informed consent. All patients had received echocardiography to examine the incidence of pericardial effusion. Causes of pericardial effusion were recorded. Data was analyzed by SPSS 24.0.

Results: Out of 220 patients 38 (17.27%) patients had pericardial effusion. Among these 26 (68.42%) were males while rest 31.58% patients were females. 5 (13.16%) patients had ages <40 years while 33 (86.84%) patients had ages >40 years. 20 (52.63%) patients had small size effusion, 15 (39.47%) patients had moderate size and 3 (7.89%) patients had large size effusion. Neoplastic diseases were the commonest cause of pericardial effusion found in 15 (39.47%) patients followed by idiopathic in 10 (26.32%), uremia in 6 (15.79%) patients, 3 (7.89%) patients had bacterial infections, 3 (7.89%) had HIV positive and 1 (2.63%) patient had other.

Conclusion: It is concluded that incidence of pericardial effusion is high in patients with unexplained dyspnea. Neoplastic was the commonest cause of pericardial effusion.

Keywords: Pericardial Effusion, Frequency, Causes, Dyspnea. Electrocardiogram

INTRODUCTION

Evaluating the heart is common practice in the modern emergency department (ED). Emergency echocardiography was first described more than a decade ago when it was recognized that life-threatening processes such as cardiac tamponade could be quickly diagnosed in the ED setting [1-3]. A brief evaluation of the heart is included in the focused abdominal sonography for trauma (FAST) examination [4]. One of the most basic indications for emergency ultrasonography of the heart in the ED is to evaluate for the presence of a pericardial effusion. It is well known that pericardial effusions can cause altered vital signs and may result in death if not rapidly treated [5]. However, findings such as distended jugular veins, pulsus paradoxus, or electrical alternans are inconsistently present and appear late in the disease process [6-8].

Pericardial effusion can be attributed to several etiologies, including malignant and non-malignant causes [9]. The known causes include neoplasia, infection, congestive heart failure(CCF), Iatrogenicity, radiation, trauma, connective tissue diseases, pericardial injury, and metabolic causes such as uremia and hypothyroidism; a substantial number of effusions are idiopathic [10].

The cause of dyspnea in a patient presenting to the ED can be varied. Emergency physicians (EPs) commonly discover reactive airways disease, lung infections, psychiatric disease, cardiac processes, anemia, CCF, and pulmonary embolism(PE) as causes for dyspnea. However, when such pathology is ruled out, some patients remain with a diagnosis of unexplained dyspnea [11]. The present study was conducted aimed to examine the frequency of pericardial effusion and associated causes in patients presented with unexplained dyspnea.

MATERIALS AND METHODS

This prospective/observational study was conducted at Cardiac Centre, Pakistan Institute of Medical Sciences (PIMS), Islamabad for duration of one year from January 2019 to Dec 2019. A total 220 patients of both genders with ages above 20 years presented with unexplained dyspnea were enrolled in this study. Patients detailed medical history including age and sex were recorded after informed written consent. Patients less than 20 years, patients with dyspnea and those with no written consent were excluded from the study.

All patients had received complete laboratory examination. Ultrasonography(US)and chest x-rays(CXRs) was performed on all the patients. Echocardiography, CT scan and MRIwas done to examine the incidence of pericardial effusion. Effusions were categorized as small when the fluid stripe measured less than (UPTO) 10 mm. Moderate-sized effusions measured 10 to 15(20) mm. Large effusions measured more than 15(20MM) mm. Causes of pericardial effusion were examined such as neoplasm, idiopathic, viral infection, collagen vascular, bacterial, renal diseases, and human immunodeficiency virus(HIV).

All the data was analyzed by SPSS 24.0. Frequencies and percentages were recorded in tabulation form. Mean±SD was applied.

RESULTS

From all the included patients 38 (17.27%) patients had pericardial effusion (figure 1). Among these 26 (68.42%) were males while rest 31.58% patients were females. 5 (13.16%) patients had ages <40 years while 33 (86.84%) patients had ages >40 years. 20 (52.63%) patients had small size effusion, 15 (39.47%) patients had moderate size and 3 (7.89%) patients had large size effusion. (Table 1)

Figure No 1: Incidence of pericardial effusion

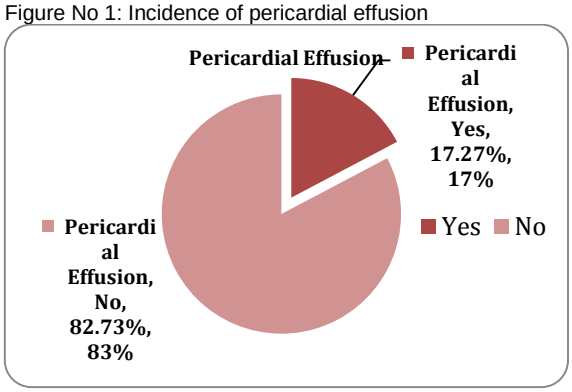
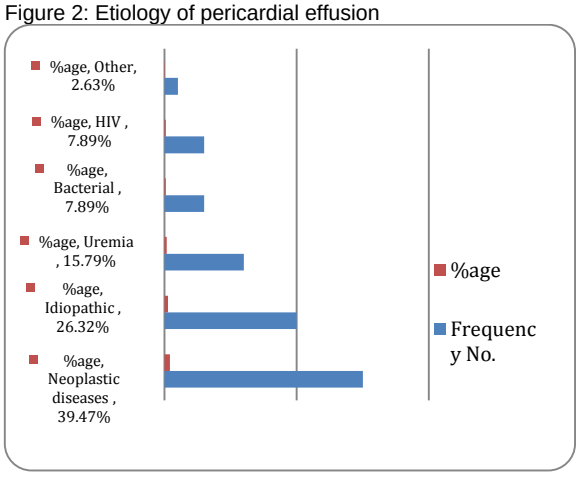


Table No 1: Demographical details of pericardial effusion patients

Characteristics	Frequency No.	%age
Gender		
Male	26	68.42
Female	12	31.58
Age (Yrs)		
<40	5	13.16
>40	33	86.84
Effusion size		
Small	20	52.63
Moderate	15	39.47
large	3	7.89

According to the causes of pericardial effusion we found neoplastic diseases were the commonest cause of pericardial effusion found in 15 (39.47%) patients followed by idiopathic in 10 (26.32%), uremia in 6 (15.79%) patients, 3 (7.89%) patients had bacterial infections, 3 (7.89%) had HIV positive and 1 (2.63%) patient had other. (Figure 2)

Figure 2: Etiology of pericardial effusion



DISCUSSION

Pericardial effusion is common clinical disorder with high rate of morbidity and mortality [12]. Unexplained dyspnea is one of the most important cause of pericardial effusion which leads to increase cardiac problems [13]. The present study was conducted to examine the frequency of pericardial effusion in patients presented with unexplained dyspnea In this regard 220 patients were enrolled and among these pericardial effusion was observed in 38 17.27% patients. A study conducted by Michael Blaivas [14] reported the incidence rate of pericardial effusion in unexplained dyspnea patients was 13.6%. Another study by Shimoni, Avi et al [15] reported that the incidence rate of pericardial effusion in myocardial infarction(MI) patients was 28.6%. Some of other studies demonstrated that the incidence rate of pericardial effusion varies 10 to 30% [16-18].

In present study male patients was high in numbers 68.42% as compared to females 31.58% and majority of patients were ages above 40 years. These results were similar to many of previous studies regarding pericardial effusion in which male patients were at high risk in developing pericardial effusion 55 to 70% as compared to females and 40 to 70 years was the commonest age group [19-20].

In our study according to the size of pericardial effusion we found that 20 (52.63%) patients had small size effusion, 15 (39.47%) patients had moderate size and 3 (7.89%) patients had large size effusion. A study conducted by Abirami Gunasekaran et al [21] regarding pericardial effusion in **hypothyroid** patients and they reported that pericardial effusion in this study was 17%. 2 out of the 70 hypothyroid patients showed evidence of pericardial effusion. Mild pericardial effusion was found in 11 patients (15.71%) and moderate pericardial effusion in 1 patient (0.01%). Michael Blaivas [14] also showed similarity to our findings in which majority of patients had small size pericardial effusion.

In present study according to the causes of pericardial effusion we found neoplastic diseases were the commonest cause of pericardial effusion found in 15 (39.47%) patients followed by idiopathic in 10 (26.32%), uremia in 6 (15.79%) patients, 3 (7.89%) patients had bacterial infections, 3 (7.89%) had **human immunodeficiency virus**(HIV) positive and 1 (2.63%) patient had other. These results were similar to many of previous studies in which neoplastic diseases, idiopathic, viral infection, renal failure and HIV positive were the important causes of pericardial effusion. Some other studies revealed that viral infection is the most common identifiable cause of acute pericarditis, the condition may be associated with many diseases. Nonviral causes of pericarditis include bacterial infection, MI, chest trauma, and neoplasm. [22-25].

CONCLUSION

Pericardial effusion is one of the most common malignant disorder that can lead to increase morbidity and mortality rate. We concluded from this study that incidence of pericardial effusion is high in patients with unexplained dyspnea. Neoplastic was the commonest cause of

pericardial effusion followed by idiopathic, collagen vascular, renal diseases, infection and HIV positive.

REFERENCES

1. Mazurek B, Jehle D, Martin M. Emergency department echocardiography in the diagnosis and therapy of cardiac tamponade. J Emerg Med. 1991; 9:27–31.
2. Mayron R, Gaudio FE, Plummer D, Asinger R, Elsperger J. Echocardiography performed by emergency physicians: impact on diagnosis and therapy. Ann Emerg Med. 1988; 17:150–4.
3. Plummer D. Principles of emergency ultrasound and echocardiography. Ann Emerg Med. 1989; 18:1291–7.
4. Gruessner R, Mentges B, Duber C, Ruckert K, Rothmund M. Sonography versus peritoneal lavage in blunt abdominal trauma. J Trauma. 1989; 29:242–4.
5. Blaivas M, Graham S, Lambert MJ. Impending cardiac tamponade, an unseen danger? Am J Emerg Med. 2000; 18: 339–40.
6. etrofsky M. Management of Malignant Pericardial Effusion. J Adv Pract Oncol. 2014 Jul/Aug;5(4):281-9.
7. Adler Y, Charron P, Imazio M, Badano L, Barón-Esquivias G, Bogaert J, Brucato A, Gueret P, Klingel K, Lionis C, Maisch B, Mayosi B, Pavie A, Ristić AD, SabatéTenas M, Seferovic P, Swedberg K, Tomkowski W, Achenbach S, Agewall S, Al-Attar N, Angel Ferrer J, Arad M, Asteggiano R, Bueno H, Caforio AL, Carerj S, Ceconi C, Evangelista A, Flachskampf F, Giannakoulas G, Gielen S, Habib G, Kolh P, Lambrinou E, Lancellotti P, Lazaros G, Linhart A, Meurin P, Nieman K, Piepoli MF, Price S, Roos-Hesselink J, Roubille F, Ruschitzka F, SagristàSauleda J, Sousa-Uva M, Uwe Voigt J, Luis Zamorano J; European Society of Cardiology (ESC). 2015 ESC Guidelines for the diagnosis and management of pericardial diseases: The Task Force for the Diagnosis and Management of Pericardial Diseases of the European Society of Cardiology (ESC)Endorsed by: The European Association for Cardio-Thoracic Surgery (EACTS). Eur Heart J. 2015 Nov 7;36(42):2921-64.
8. Imazio M, Gaita F. Diagnosis and treatment of pericarditis. Heart. 2015 Jul;101(14):1159-68.
9. Burazor I, Imazio M, Markel G, Adler Y. Malignant pericardial effusion. Cardiology. 2013;124(4):224-32.
10. Rao A, Chariyawong P, Nantsupawat T, Warraich I, Nair N. Pericardial effusion and constriction as an initial presentation of acute t-cell lymphoblastic lymphoma. The Southwest Respiratory and Critical Care Chronicles 2019;7(28):28–32
11. Monappa V, Reddy S, Kudva R. Hematolymphoid neoplasms in effusion cytology. Cytojournal2018;15:15.
12. Imazio M, Demichelis B, Parrini I, et al. Relation of acute pericardial disease to malignancy. Am J Cardiol2005;95:1393.
13. Michael Blaivas. Incidence of Pericardial Effusion in Patients Presenting to the Emergency Department with Unexplained Dyspnea. ACADEMIC EMERGENCY MEDICINE 2001; 8:1143–1146.
14. Incidence and Significance of Pericardial Effusion in Patients With Pulmonary Arterial Hypertension.Shimony A., Fox B.D., Langleben D., Rudski L.G.s(2013) Canadian Journal of Cardiology, 29 (6) , pp. 678-682.
15. Albugami S, Al-Husayni F, Almalki A, et al. (January 11, 2020) Etiology of Pericardial Effusion and Outcomes Post Pericardiocentesis in the Western Region of Saudi Arabia: A Single-center Experience. Cureus 12(1): e6627. doi:10.7759/cureus.6627
16. Strobbe A, Adriaenssens T, Bennett J, et al.: Etiology and long-term outcome of patients undergoing pericardiocentesis. 2017, 6:e007598. 10.1161/JAHA.117.007598.
17. gliatti P, Donato R, de Gregorio C, Patane S: A massive pericardial effusion in a cancer patient. Int J Cardiol. 2015, 181:138-40. 10.1016/j.ijcard.2014.11.141
18. El Haddad D, Iliescu C, Yusuf SW, William WN Jr, Khair TH, Song J, Mouhayar EN: Outcomes of cancer patients undergoing percutaneous pericardiocentesis for pericardial effusion. J Am Coll Cardiol. 2015, 66:1119-28. 10.1016/j.jacc.2015.06.1332
19. Turak O, Gürel M, Çagli K, et al.: Pericardial effusion: etiology, diagnose and management [Article in English, Turkish]. Duzce Med J. 2012, 14:23-27.
20. Kennedy Hall M, et al. The "5Es" of emergency physician-performed focused cardiac ultrasound: a protocol for rapid identification of effusion, ejection, equality, exit, and entrance. AcadEmerg Med. 2015 May;22(5):583-93.
21. Sagristà-Sauleda J, Mercé AS, Soler-Soler J. Diagnosis and management of pericardial effusion, World J Cardiol, 2011, vol. 3 (pg. 135-143).
22. Adler Y, Charron P, Imazio M, Badano L, Baron-Esquivias G, Bogaert J et al. 2015 ESC Guidelines for the diagnosis and management of pericardial diseases: The Task Force for the Diagnosis and Management of Pericardial Diseases of the European Society of Cardiology (ESC) Endorsed by: The European Association for Cardio-Thoracic Surgery (EACTS). Eur Heart J 2015;36:2921–64.
23. You SC, Shim CY, Hong GR, Kim D, Cho IJ, Lee S, Chang HJ, Ha JW, Chang BC, Chung N. Incidence, Predictors, and Clinical Outcomes of Postoperative Cardiac Tamponade in Patients Undergoing Heart Valve Surgery. PLoS One. 2016; 11(11):e0165754. Epub 2016 Nov 17.
24. Pérez-Casares A, Cesar S, Brunet-Garcia L, Sanchez-de-Toledo J. Echocardiographic Evaluation of Pericardial Effusion and Cardiac Tamponade. Front Pediatr. 2017; 5:79. Epub 2017 Apr 24.
25. Yacoub M, Mahajan K. StatPearls [Internet]. StatPearls Publishing; Treasure Island (FL): Dec 11, 2019. Constrictive-Effusive Pericarditis.