

Characteristics of recurrent pericardial effusions

Shahbaz Sarwar C M, Fatimi S

ABSTRACT

Introduction: There are various aetiologies for recurrent pericardial effusions. Malignancy is the commonest cause in the West, but in Asia and sub-Saharan Africa, tuberculosis is common and contributes towards a high prevalence of tuberculous recurrent pericardial effusions.

Methods: In our hospital-based descriptive study of 32 patients, we looked into various characteristics of recurrent pericardial effusions using the hospital data.

Results: We found tuberculosis to be the commonest cause of recurrent effusions, occurring in 50 percent (n = 16) of our patients, followed by malignancy (n = 9). The clinical features at presentation in patients who eventually developed recurrent pericardial effusions were more severe, compared to uncomplicated pericardial effusions.

Conclusion: Knowledge of the presenting features of patients with recurrent pericardial effusions is crucial, so that they can be placed under increased surveillance and considered for early institution of pericardial fluid drainage procedures.

Keywords: pericardial effusions, recurrent pericardial effusions, tuberculosis

Singapore Med J 2007; 48(8):725–728

INTRODUCTION

Recurrent pericardial effusions can be a manifestation of a diversity of underlying diseases and need close monitoring.⁽¹⁾ Patients may be asymptomatic, or have symptoms ranging from mild to severe dyspnoea, cough, and chest pain, depending on the rate of fluid accumulation, absolute volume, and physical characteristics of the pericardial effusion.^(1,2) Common causes are malignancy, infection, uraemia, aortic dissection, tuberculosis and open heart surgery. Effusions due to heart surgery, uraemia and aortic dissection can be easily diagnosed by patient history and clinical examination, but other

important causes can be difficult to identify if the patient presents with recurrent unexplained pericardial effusions with non-specific history. Effusions due to malignancy, infections and tuberculosis, can manifest as recurrent pericardial effusions and require urgent attention, because of their poor prognosis.⁽¹⁾ Thus, prompt diagnosis and the earliest possible treatment would be the most efficient approach.

Subjecting every patient with suspected pericardial effusion to computed tomography, magnetic resonance imaging and echocardiographic-guided pericardiocentesis, is currently not cost-effective for countries with limited health resources. This underlines the importance of early suspicion in patients that are likely to have recurrent pericardial effusion. Clinical evidence shows a high prevalence of tuberculous disease in the developing countries, but there is a current lack of documentary evidence regarding the causes of recurrent pericardial effusions attributed to this aetiology. We undertook this in-hospital descriptive study to explore the epidemiology of patients suffering from recurrent pericardial effusions. The knowledge of prevalence of these factors will help in determining their contribution and impact in the development of recurrent pericardial effusions in developing countries. Additionally, it may help not only in modifying the preventive strategies, but also to develop more prudent and effective management guidelines. This study emphasises the need for further research in the area of recurrent pericardial effusions, particularly in the regions with a high rate of tuberculosis.

METHODS

This is a descriptive case series, which aims at determining the prevalence of various causal factors in patients who have undergone two or more invasive surgical procedures (pericardiocentesis and pericardial window) involving the pericardium for recurrent pericardial effusions, at The Aga Khan University Hospital from February 1994 to September 2001. The patients were identified by the hospital computer data registry system. 99 cases with pericardial effusion were documented, out of which 32 were diagnosed and managed for recurrent pericardial effusions. Pre-testing of the data extraction sheet was done on 20 cases fulfilling the inclusion criteria. The data were obtained through an extensive review of the patient's medical records, including admission data,

Department of Surgery,
The Aga Khan University,
Faculty of Health Sciences,
Stadium Road, Karachi,
Pakistan

Shahbaz Sarwar CM, MD
Research Assistant

Fatimi S, MD
Associate Professor in Cardiothoracic Surgery

Correspondence to:
Dr CM Shahbaz Sarwar
70A Block J-1, Wapda Town, Lahore, Pakistan
Tel: (92) 334 9866 381
Fax: (92) 42594 5206
Email: csarwar1@jhmi.edu; shahbaz.sarwar@gmail.com

Table I. Aetiology of recurrent pericardial effusions.

Causes	No. (%)
Malignancy	9 (28)
Tuberculosis	16 (50)
Renal failure	3 (9.4)
Idiopathic	2 (6.3)
Others*	2 (6.3)
Total	32 (100)

* Benign mediastinal lymphadenopathy = 1; Sarcoidosis = 1

Table II. Clinical findings in patients with recurrent pericardial effusions.

Signs and symptoms	No. (%)
Dyspnoea	25 (78)
Cough	22 (69)
Chest pain	14 (44)
Shortness of breath	11 (35)
Orthopnoea	23 (72)
Palpitations	10 (31)
Fatigue	6 (19)
Fever	15 (47)
Tachycardia	14 (44)
Jugular venous distention	12 (38)
Pulsus paradoxus	9 (28)
Low pulse pressure	5 (16)
Decreased breath sounds	19 (59)

* Total percentages > 100 because individual patients often had multiple signs and symptoms.

Table III. Results of diagnostic studies.

Study	No. (%)
Chest radiograph	
Enlarged cardiac silhouette	30 (94)
Pleural effusion	20 (69)
Electrocardiogram	
Low QRS amplitude	17 (53)
Sinus tachycardia	16 (50)
Echocardiogram	
Small effusion (50–250 ml)	1 (3)
Moderate effusion (250–500 ml)	14 (44)
Large effusion (> 500 ml)	17 (53)
Tamponade/right ventricular collapse	14 (44)

* For chest radiograph and echocardiogram, percentage is that of all patients (n = 32); for electrocardiogram, percentage is of those who had had electrocardiogram only (n = 26).

daily progress notes, surgical reports, diagnostic studies, echocardiographs, cytological and histopathological reports, and correspondences. Data was coded and analysed using the Statistical Package for Social Sciences version 10.0 (SPSS Inc, Chicago, IL, USA).

RESULTS

32 patients with recurrent pericardial effusions were studied after reviewing 99 patients with pericardial effusions. The patient group included 22 females and ten males, with a mean age of 34 (range 2–70) years. Majority of the patients presented with tuberculosis and malignant disease. There were 16 patients with tuberculosis and nine patients with malignancy. When combined, these two diagnoses represented 78% of all cases of recurrent pericardial effusions. The primary pathologies are listed in Table I. The clinical findings are listed in Table II. Our patients were symptomatic, with dyspnoea (78%) being the most common complaint. Orthopnoea (72%) and cough (69%) were also noted to have a relatively common frequency. Tachycardia (44%) and jugular venous distention (38%) were the most common physical findings noted. Diminished breath sounds were observed in 59% of patients, likely reflecting the high incidence of coexisting pleural effusions in patients with pericardial effusions. Shortness of breath (35%), fever (47%), and pulsus paradoxus (28%) were also frequent findings. 19 patients (59%) were found to have clinical and/or echocardiographical signs of pericardial tamponade.

The work-up for presumed pericardial effusions is supplanted by modern diagnostic studies, the results of which are listed in Table III. Pre-treatment chest radiographs were obtained in all the patients, which showed enlarged cardiac silhouette in 94% of cases, whereas pleural effusion was observed in 69%. Electrocardiograms were done in 26 patients, and demonstrated a diminished principle deflection in QRS amplitude in 53% of patients. Sinus tachycardia was also a frequent finding. One patient had diffused ST segment and T-wave changes consistent with the diagnosis of pericarditis. Echocardiograms were obtained for all the patients and revealed pericardial effusion in all the cases. Aside from quantifying the effusions, echocardiography demonstrated physiological evidence of pericardial tamponade in 14 patients. Effusions were diagnosed based on the cytological analysis of the pericardial fluid and/or histological examination of the excised pericardial tissue. There were 16 (50%) documented cases of tuberculosis and nine (28%) with malignant diseases. The diagnosis of uraemic pericarditis due to renal failure was made in only three (9.4%) patients (Table I).

DISCUSSION

In the West, malignancy is the most common cause

of large pericardial effusions, followed by uraemia.⁽³⁾ Gibbs et al, in a large ten-year series of pericardial effusions, reported a high incidence of large tuberculous pericardial effusions when compared with previously-published European case series, and this was considered a reflection of the local multicultural population, with a high proportion of Indo-Asian and Afro-Caribbeans.⁽⁴⁾ However, in another study done at our hospital, Quraishi et al reported malignancy (50%) to be the leading cause of pericardial effusions, followed by tuberculosis (25%).⁽⁵⁾ As there was no data available, specifically on the recurrent pericardial effusions, from South Asian countries, there is a need for defining and standardising the definition of recurrent pericardial effusion, so that the various aspects of its aetiology and management could be studied as a specific classified entity.

We labelled effusions that required two or more invasive procedures of drainage, as recurrent pericardial effusions. With the application of this criterion, we found tuberculosis to be the leading cause in the aetiology of recurrent effusions, followed by malignancy.

The largest number of tuberculosis cases occur in the Southeast Asian region, which accounts for 33% of the incident cases globally.⁽⁶⁾ However, in sub-Saharan Africa, this incidence is nearly twice that of Southeast Asia.⁽⁶⁾ With these soaring incidence figures, tuberculosis should be a strong consideration in patients that present with the recurrent pericardial effusions in this region. The clinical signs and symptoms in patients who develop recurrent pericardial effusions are more severe as compared to patients with uncomplicated pericardial effusions.⁽⁵⁾ Our findings, when compared to uncomplicated pericardial effusions, show a higher occurrence of symptoms like dyspnoea, chest pain and palpitations. However, it was interesting to note that this was not the case when looking at the severity of the clinical signs in these patients. When compared to the clinical signs described in the various studies on uncomplicated pericardial effusions, it was observed that our patients with recurrent pericardial effusions had less severe signs (e.g. raised jugular venous pressure, pulsus paradoxus). This finding could be explained under the hypothesis that patients with recurrent effusions have more severe diseases, but they are managed closely and their effusions are drained intermittently, thus they are kept haemodynamically more stable under increased surveillance.

In our series, symptoms like dyspnoea, chest pain, orthopnoea and cough, and signs like jugular venous distension and tachycardia, were more common and suggestive of a tendency towards recurrent pericardial effusion. Although clinical signs and symptoms are not entirely reliable, they should still have a high index of suspicion for recurrent pericardial effusion, and steps

should be taken early on, towards surgical drainage through a pericardial window formation. This is important in developing countries where the prevalence of tuberculous recurrent pericardial effusions seems to be greater, but the availability of close monitoring for accumulation and re-accumulation of effusions is not available.

Tuberculosis remains a common cause of pericarditis in developing countries, although it accounts for less than 5% of cases in the West.⁽⁷⁾ In our series, fever, night sweats and weight loss were common, as observed in other case series with tuberculous pericardial effusions.^(5,16) In more than 80% of cases, the aspirated pericardial fluid in tuberculosis is haemorrhagic.⁽⁸⁾ The diagnosis of tuberculous pericarditis is confirmed by the presence of acid-fast bacilli in the pericardial fluid or on the biopsy of the pericardium. As seen in our series, acid-fast bacilli are difficult to isolate from pericardial fluid;⁽⁷⁾ they are rarely seen on direct examination, and the positive culture rate from conventional culture is only around 50%, although immediate inoculation in double strength liquid Kirchner culture medium increases the yield to 75%.⁽⁹⁾ The diagnostic yield of pericardiocentesis and pericardial biopsy also appears to be similar. A “probable” diagnosis of tuberculous pericarditis is thus made by the confirmation of tuberculosis elsewhere in a patient with an unexplained pericardial effusion, and a “definite or probable” diagnosis is made in up to 70% of patients treated for tuberculous pericarditis.^(9,10) The chest radiograph shows active tuberculosis in only 30% of patients with tuberculous pericarditis, and a pleural effusion is present in 40%–60% of cases.⁽¹¹⁾ Results of our study showed presence of pleural effusions in 69% of the cases. The tuberculin skin test is generally of limited value in patients from developing countries, because of the high prevalence of primary tuberculosis and the widespread use of Bacillus of Calmette and Guérin (BCG) immunisations.^(10,11)

The echocardiographical features of the recurrent effusions in our cases were more severe as compared to the other series reported with pericardial effusions. Nearly half of our patients had large pericardial effusions, while 44% of the total cases eventually had a cardiac tamponade during the course of their illness. This reinforces the need to have a high index of suspicion of recurrent pericardial effusion in patients presenting with the abovementioned characteristics and to have low threshold for pericardial drainage procedures in such high-risk patients. There is a need to extensively study the features of recurrent pericardial effusion, and to define the patient population on the basis of clinical findings and investigations, which would qualify them as high-suspicion cases for early management.

REFERENCES

1. Lee CH, Chan GS, Chan WM. Unexplained recurrent pericardial effusion: a lethal warning? *Heart* 2003; 89:e11.
2. Little WC, Freeman GL. Pericardial disease. *Circulation* 2006; 113:1622-32.
3. Fowler NO. Cardiac tamponade. A clinical or an echocardiographic diagnosis? *Circulation* 1993; 87:1738-41.
4. Levy PY, Fournier PE, Charrel R, et al. Molecular analysis of pericardial fluid: a 7-year experience. *Eur Heart J* 2006; 27:1942-6.
5. Quraishi AR, Khan AA, Kazmi KA, et al. Clinical and echo cardiographic characteristics of patients with significant pericardial effusion requiring pericardiocentesis. *J Pak Med Assoc* 2005; 55:66-70.
6. Khushk IA, Ahmed I, Shah SS. Tuberculosis control in Pakistan: current issues and challenges. *J Coll Physicians Surg Pak* 2006; 16:387-8.
7. Permanyer-Miralda G, Sagristá-Sauleda J, Soler-Soler J. Primary acute pericardial disease: a prospective series of 231 consecutive patients. *Am J Cardiol* 1985; 56:623-30.
8. Gibbs CR, Watson RD, Singh SP, Lip GY. Management of pericardial effusion by drainage: a survey of 10 years' experience in a city centre general hospital serving a multiracial population. *Postgrad Med J* 2000; 76:809-13.
9. Strang G, Latouf S, Commerford P, et al. Bedside culture to confirm tuberculous pericarditis. *Lancet* 1991; 338:1600-1.
10. Ng TTC, Strang JI, Wilkins EG. Serodiagnosis of pericardial tuberculosis. *QJM* 1995; 88:317-20.
11. Fowler NO. Tuberculous pericarditis. *JAMA* 1991; 266:99-103.