

Etiological profile of acute pericarditis at the Yalgado-Ouedraogo university hospital in Ouagadougou at Burkina Faso

Abstract

Introduction: The etiological research is a crucial step in the management process of acute pericarditis because it conditions the choice of the appropriate treatment.

Objective: To describe the etiology profile of acute pericarditis at Yalgado Ouedraogo University Hospital (YO/UO).

Material and methods: We conducted a cross-sectional study with retrospective collection of the records of patients hospitalized in the cardiology department of YO/UO. The records of patients hospitalized for acute pericarditis during the period from January 1, 2014 to December 31, 2018, i.e. a period of 5 years, were included in our study.

Results: During the period of our study, 155 cases of all forms of pericarditis were managed in the cardiology department of YO/UO out of a total of 3660 recorded hospitalizations. The frequency of pericarditis was 4.23%. Acute pericarditis represented 67.10% (104 cases) of pericarditis. The average age was 38.83±18.02 years with extremes of 13 and 90 years. The most represented age group was 20 to 30 years. The sex ratio was 1.48. Tuberculosis was the dominant etiology with 50% of cases. It was followed by HIV-related pericarditis, found in thirteen patients, i.e. 12.50% of cases. The latter consisted of three cases of pericarditis occurring during isolated HIV infection and 10 cases of pericarditis associating tuberculosis and HIV.

Conclusion: The etiologies of acute pericarditis YO/UO of Ouagadougou are dominated by tuberculosis. The association of HIV and tuberculosis increases the risk of occurrence of acute pericarditis.

Keywords: pericarditis, etiologies, tuberculosis, Burkina Faso

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Abbreviations: AFB, acid-fast bacilli; ECG, electrocardiogram; ESC, european society of cardiology; HIV, human immunodeficiency virus; TTE, transthoracic echocardiography; UO, university hospital; YO, yalgado ouédraogo

Introduction

Acute pericarditis is an inflammation of the pericardium with or without effusion.¹ In practice, once the diagnosis of acute pericarditis is made, the etiological research is of paramount importance for the clinician, it conditions the initiation of the appropriate treatment. Several causes can be evoked, the pericardium can be affected in several types of systemic disorders or be the object of an isolated disease.² The geographical origin of the patient can orientate the etiological research.³ In the current state of available studies on acute pericarditis, viral diseases are known as the main etiologies in developed countries.^{1,2,4,5} While tuberculosis is the predominant cause in developing countries, especially in sub-Saharan Africa, it is very often associated with acquired immunodeficiency virus (HIV) infection.^{1,4,6-9} However, data on acute pericarditis are still scarce in the medical scientific literature in Africa south of the Sahara, particularly in Burkina Faso.^{4,7,10} Hence the interest of our study with the objective of studying the etiological profile of acute pericarditis at YO/UO in Ouagadougou.

Material and methods

This was a cross-sectional study with retrospective collection on

the records of patients hospitalized in the cardiology department of the University Hospital Center Yalgado OUEDRAOGO (CHU-YO), in the city of Ouagadougou in Burkina Faso.

Were included in our study, the patient records hospitalized for acute pericarditis during the period from January 1, 2014 to December 31, 2018, that is to say duration of 5 years with or without liquid effusion; without distinction of race or sex. Patients hospitalized for recurrent pericarditis were not included in the study. Data were collected from the hospitalization registers of the cardiology department of the UHC-YO, the patients' medical records, and the hospital's statistical yearbooks. The data were recorded on survey forms. A systematic review of the records of patients hospitalized for acute pericarditis during the entire study period was conducted.

Socio-demographic data, medical and surgical history, clinical data, paraclinical data including diagnostic confirmation elements at trans thoracic Doppler echocardiography, chest X-ray, electrocardiogram and biological tests were systematically searched in the files.

Acute pericarditis, myopericarditis, confirmed tuberculous pericarditis, probable tuberculous pericarditis, HIV-related pericarditis, viral pericarditis were evoked using the clinical, electrocardiographic and echocardiographic criteria defined by the European Society of Cardiology (ESC).¹ The diagnosis of acute pericarditis was made on the basis of the presence of at least 2 of the following 4 criteria: Pericardial chest pain; Pericardial friction; New diffuse ST elevation or PQ undershift on electrocardiogram (ECG); Pericardial effusion (new or worsening).¹

The diagnosis of myopericarditis was made on the basis of an increase in biomarkers of myocardial injury (troponin, CPK-MB) with or without new focal or diffuse myocardial injury or left ventricular function on transthoracic echocardiography (TTE). Tuberculous pericarditis has been confirmed on the basis of the presence of tubercle bacilli in the pericardial fluid or in histological analyses of the pericardium, by culture or PCR.¹

Tuberculous pericarditis was considered probable if there was a confirmed focus of extrapericardial tuberculosis in a patient with unexplained pericarditis, lymphocytic pericardial exudate with increased levels of unstimulated interferon-gamma, adenosine deaminase, or lysozyme, and/or an adequate response to anti-tuberculosis therapy.¹

For a definitive diagnosis of viral pericarditis, a complete workup of histological, cytological, immunohistological and molecular investigations in pericardial fluid and peri-epicardial biopsies should be considered. In the absence of such arguments, we have preferred the term “presumed viral pericarditis” in accordance with the recommendations.¹

HIV-related pericarditis was diagnosed on the basis of acute pericarditis with positive HIV serology.¹ The size of the pericardial effusion on cardiac Doppler ultrasonography was considered minimal for pericardial detachment less than 10 millimeters, of medium abundance pericardial detachment between 10 and 20 millimeters in thickness and of great abundance for pericardial detachment greater than 20 millimeters.¹ Data were entered and analyzed using Epi info version 7 software. The Ki-deux and Student’s t test was used for comparison of proportions and means. A threshold of p less than 5% was considered statistically significant. Our study was conducted with respect to the anonymity of the patients and the confidentiality of the collected results.

Results

Socio-demographic characteristics

During the period of our study, 155 cases of all forms of pericarditis were managed in the cardiology department of YO/UO out of a total of 3660 hospitalizations recorded during the same period. The frequency of pericarditis was 4.23%. Acute pericarditis represented 67.10% (104 cases) of pericarditis. The average age was 38.83±18.02 years with extremes of 13 and 90 years. The most represented age group was 20 to 30 years. The sex ratio was 1.48 (42 women to 62 men). The figure below shows the hospital frequency of pericarditis by year.

Clinical features

Chest pain, dyspnea and hyperthermia (not quantified) were the major symptoms. They were found in 85.58%, 75% and 67.31% of patients respectively. A notion of tuberculosis infection was found in fifteen patients (4.42%). People known to be living with HIV (PLHIV) represented 10.58%.

Concerning the general signs, an infectious syndrome was found in 52.88% of cases. The general condition of the patients was preserved (WHO stage 1 and 2) in 56.73% of cases and the state of consciousness was normal with a Glasgow score of fifteen in 97.12% of cases. Blood pressure was optimal in 66.67% of cases. The dominant physical sign was tachycardia found in seventy patients (67.31%) followed by muffled heart sounds (22.12%). Pericardial friction was found in fifteen patients (14.42%) and signs of right heart failure were present in fifty three patients (50.96%).

Paraclinical characteristics

A frontal chest X-ray was performed in sixty patients. Cardiomegaly was present in fifty seven patients (95%).

Electrocardiogram was performed in ninety-six patients. The disorders of ventricular repolarization were found in eighty-four patients (80.77%). Stage III of the HOLZMANN classification was the most represented (55.20%).

All patients had undergone transthoracic cardiac echocardiography. Pericardial effusion was found in one hundred patients (98.04%). It was abundant in fifty-six patients (56%). HIV serology was positive in 13 patients, no viral load was found. Sputum examination for Acid-fast bacilli (AFB)s was performed in fifty-two patients and was positive in four. The tuberculin test was performed in twenty seven patients (25.96%) and was positive in 11. Serosal puncture was performed in forty-nine patients (47.11%). The macroscopic appearance of the puncture fluid was citrine yellow in seventeen patients; serum in fourteen was incoagulable and purulent in three. Thirty-three (73.33%) of the puncture fluids showed a predominantly lymphocytic leukocytosis and two (8%) were positive for AFB.

Etiologies of acute pericarditis

Tuberculosis etiology was dominant with 50% of cases. It was followed by HIV-related pericarditis, found in thirteen patients, i.e. 12.50% of cases. The latter consisted of three cases of pericarditis occurring during isolated HIV infection and 10 cases of pericarditis associating tuberculosis and HIV. Table 1 indicates the different etiologies of pericarditis found during study.

Table 1 Distribution of 104 cases of acute pericarditis by etiology

| Etiology | Number (n) | Frequency (%) |
|-----------------------------------|------------|---------------|
| Tuberculosis | 52 | 50 |
| HIV | 13 | 12.50 |
| underterminated | 8 | 7.69 |
| idiopatic | 8 | 7.69 |
| rheumatic | 7 | 6.73 |
| Viral other than HIV | 6 | 5.77 |
| Uremic | 3 | 2.88 |
| neoplasmic | 3 | 2.88 |
| Post myocardial infarction | 1 | 0.96 |
| Bacterial other than tuberculosis | 1 | 0.96 |
| myxoedeme | 1 | 0.96 |
| parasite | 1 | 0.96 |

Acute pericarditis of tuberculous etiology was confirmed in only 2 patients, i.e. 3.85% of cases.

Associated diagnosis

Acute pericarditis was associated with an effusion of other serous membranes, notably the pleura and the peritoneum, in twenty patients (19.23%). Pleuropneumopathy was noted in seventeen patients (16.35%).

Discussion

Socio-demographic characteristics

We observed an intra-hospital frequency of pericarditis of 4.23%. Recent data from sub-Saharan Africa show that the intra-hospital frequency of pericarditis, while remaining relatively low overall, varies according to the patient population concerned.⁴ Adebayo

et al in Ife in 2013 found 1.1% in patients with cardiological complaints,¹¹ Ogah et al in Abeokuta found 1.8% in patients referred for echocardiography,¹² Pio et al in Lomé in 2016 found 2% in patients hospitalized in a cardiology department.¹³ This variability of these frequencies would probably be related to the different sample sizes but also to the disparity in the supply of specialized cardiological care in the health systems of the countries where these studies were conducted.¹⁴

Table 2 frequencies of associated diagnoses during pericarditis (N = 104)

| Associated diagnoses | number (n) | Percentage (%) |
|---|------------|----------------|
| Effusion from other serous membranes | 20 | 19.23 |
| (pleura ≠ peritoneum) | (18 ≠ 2) | (17.31 ≠ 1.92) |
| Pleuro-pneumopathy | 17 | 16.35 |
| Myocarditis | 15 | 14.42 |
| Chronic renal failure | 3 | 2.88 |
| Hepatitis | 3 | 2.88 |
| Stroke | 2 | 1.92 |
| Acute renal failure | 2 | 1.92 |
| Valvulopathy | 2 | 1.92 |
| Respiratory disease | 1 | 0.96 |
| Bronchopneumopathy | 1 | 0.96 |
| Cerebral and digestive opportunistic infections | 1 | 0.96 |
| Progressive intrauterine pregnancy | 2 | 1.92 |

Clinical characteristics

It is accepted that pericarditis is clinically manifested by a set of more or less specific symptoms and signs. Chest pain is regularly described as the main symptom.^{1,3,15} We found it in 85.58% of patients. The majority of contemporary studies on pericarditis confirm this preponderance of pain in the forefront of the symptomatology.¹³ Tachycardia and muffled heart sounds were the most common stethacoustic signs (respectively 67.31% and 22.12%). Pericardial rubbing was found in only 14.42% of patients, less than one third of our study population, contrary to what is found in the literature.³ This is probably due to its inconstant and labile nature, which makes its detection sometimes hazardous.³

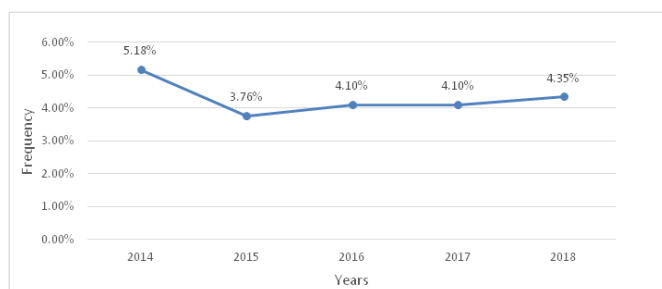


Figure 1 Annual frequency of acute pericarditis cases (n= 104)

Paraclinical features

Chest x-ray may be typically normal in patients with acute pericarditis. Cardiomegaly may be present if there is a large effusion of more than 300 ml. Therefore, pericarditis should be suspected in a patient with new or unexplained cardiomegaly on the radiograph, especially if the lung fields are free.^{1,3} In our series, out of sixty patients in whom chest radiography was performed, cardiomegaly was found in fifty seven (95%). The large proportion of patients in whom chest radiography was not available can be explained both by the financial limitations of these patients and the reluctance of practitioners to order

this examination when transthoracic Doppler echocardiography has already been performed. This was the case in many of these patients.

The pericardium being electrically inert, the electrocardiographic changes during an inflammation of the pericardium are essentially due to the participation of the myocardium in its subepicardial layer. This is all the more true as the pathogens involved in pericardial infections are also involved in myocardial infections. Hence the interest of the cardiac enzyme assay.^{1,3} Due to the inability of many patients to pay for the paraclinical investigations, troponin I was measured in only seven patients and was positive in three. The classical electrocardiographic evolution goes through the four stages of HOLZMANN.³ Stage III was the most represented in our study (55.20%). Cohen et al in Paris in 2006 found in a series of 55 patients, a predominance of stage I (58%).¹⁶ while Pio et al in Lomé in 2016 did not find any ECG anomaly that could refer to the first three stages of HOLZMANN.¹³ These differences can be explained by the time taken to manage patients, which varies according to the context. Indeed, HOLZMANN stages I and II are observed during the first week after the beginning of the inflammation of the pericardium. We recorded only seven patients (8.67%) received within this time frame.

Trans-thoracic echocardiography (TTE), although sometimes normal in cases of purely fibrinous acute pericarditis, is the first-line imaging examination in cases of suspected pericardial disease because it can accurately diagnose pericardial effusion, tamponade and ventricular dysfunction in relation to associated myocardial disease.^{1,17,18} A TTE was performed in all patients included in our study. One hundred patients (98%) had a pericardial effusion, twelve (11.76%) were in tamponade state and four (3.90%) in pre-tamponade state. Pio et al found similar data with 82% of circumferential pericardial effusion in patients with acute pericarditis.¹³ Bouakez et al. found in Jendouba in Tunisia a pericardial effusion in 87% of patients.

Etiologies of acute pericarditis

The probable tuberculosis etiology was dominant with 50% of the cases, followed by HIV-related pericarditis, found in thirteen patients (12.50%). The predominance of tuberculosis etiology in our series is similar to what is described in the contemporary literature.^{1,19} According to Mayosi et al tuberculosis is the most common cause of pericarditis in Africa where it is still endemic in most developing countries. In the presence of pericarditis, a confirmed tuberculosis, regardless of its location, should lead to the suggestion of a tuberculosis cause.¹⁹ Pio et al. found 67% of tuberculosis.¹³ Bouakez et al found 31.5%.²⁰ Moreover, the association with HIV infection increases the risk of acute pericarditis. Out of thirteen cases of HIV patients in our series, ten were associated with tuberculosis. Menanga et al in Yaoundé in 2015 narrowed 56.5% of pericardial effusion in a series of 53 HIV-infected patients.⁶ Most studies in Africa on acute pericarditis have a sample size of less than 100 patients. The largest study would be that of Reuter H et al in 2005 in South Africa. It was conducted on 233 cases of pericardial effusion. 36.1% of the participants had HIV infection. The primary cause was tuberculosis in 69.5% of patients.²¹ No specific etiology was determined in 7.69% of patients in our study. We classified these cases as idiopathic pericarditis.

Conclusion

Determining the cause of acute pericarditis is an essential step he etiologies of acute pericarditis at the Yalgado Ouedraogo University Hospital in Ouagadougou are dominated by tuberculosis. The association of HIV and tuberculosis increases the risk of acute pericarditis.

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Conflicts of interest

No conflicts of interest.

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