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International Journal of Cardiovascular Medicine

Meriam Amri *

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Research Article

Infective Endocarditis in Patients with Rheumatic Heart Disease: Casablanca's Experience

M. Amri *, A. Altimimi, D. Bennani, R. Habbal

CHU Ibn Rochd, Cardiology department, Casablanca, Morocco

***Corresponding Author:** Meriam Amri, CHU Ibn Rochd, Cardiology department, Casablanca, Morocco.

Received date: June 21, 2024; Accepted date: July 08, 2024; Published date: July 19, 2024

Citation: M. Amri, A. Altimimi, D. Bennani, R. Habbal, (2024), Infective Endocarditis in Patients with Rheumatic Heart Disease: Casablanca's Experience, *International Journal of Cardiovascular Medicine*, 3(4); **DOI:**10.31579/2834-796X/070

Abstract

Background: Infective endocarditis poses a significant challenge with high morbidity and mortality risks, yet the African context lacks comprehensive studies on this critical health issue.

Objectives: This study aims to bridge this gap by providing epidemiological insights into infectious endocarditis within a hospital in Casablanca, Morocco, a nation in perpetual development where rheumatic heart disease persists.

Methods: A retrospective case series of 87 adult patients admitted to the Cardiology department of CHU Ibn Rochd between 2013 and 2022 for infective endocarditis was conducted. Data analysis was performed using Microsoft Excel and SPSS.

Results: It revealed that 47 patients had rheumatic heart disease. Bacterial identification occurred in less than half of the cases, predominantly staphylococcus. Surgical interventions were limited, and the mortality rate reached 23%.

Conclusions: This study sheds light on the epidemiological profile of infective endocarditis in Morocco, emphasizing a considerable disparity compared to Western counterparts. The findings underscore the urgent need for focused efforts and interventions to address the unique challenges posed by infective endocarditis in Morocco and, by extension, the broader African context.

Keywords: diastolic dysfunction; electrocardiography; exercise electrocardiography; left ventricle; lead v1; p wave; treadmill testing

Introduction

The clinical entity of infectious endocarditis (IE), which poses a high risk of morbidity and mortality, continues to be challenging. IE continues to impact younger populations in developing countries, due in part to the continuous burden of rheumatic heart disease (RHD), which is now uncommon in the majority of industrialized countries thanks to better access to healthcare and better living conditions. Few studies have examined the impact and prognosis of IE complicating RHD in the contemporary era of enhanced diagnosis and surgical therapy. In fact, in 2022 in The Lancet Global Health, the lack of information regarding endocarditis in Africa was highlighted. In order to overcome this, our study's objective was to describe the clinical and epidemiologic characteristics of IE in rheumatic heart disease patients in a specific population of Africa, a developing country, which is fighting to escape from acute rheumatic fever, especially since the efforts of recent decades, and which is trying to catch up with developed countries.

Methods:

A retrospective case series of 87 adult patients hospitalized in Cardiology department of CHU Ibn Rochd between 2013 and 2022 for IE. The diagnosis of RHD was determined by echocardiographic characteristics or a history of valvular disease and rheumatic fever. We documented the results from microbiological and echocardiographic tests, treatment approaches, and observed side effects. Demographics and outcomes were then compared, stratified by the presence or absence of RHD. We excluded patients under the age of 15, those with a history of complex congenital heart disease, cases of endocarditis in cardiac implantable electronic devices. The median follow-up period was 29 months (the range was 0-41 months).

Data were collated with Microsoft Excel and analysis undertaken with SPSS.

Results:

Among our 87 patients, 47 patients had RHD. There was no significant difference regarding gender. The average age of patients with RHD was relatively younger than that of NRHD (39.7 years vs. 60.3 years). The IE with RHD group had significantly more history of IE (23% vs. 3%) as well as a low socio-economic level (88% vs. 52%).

Concerning the entrance door, in almost a quarter of cases (24.1%) it was dental. Other portals of entry, notably cutaneous, digestive, pulmonary and urinary, were less frequent. in 51.9% of cases, no entrance door was decelerated. Only 5% of the population was affected by intravenous drug use, i.e., 2 people who were part of the NRHD group.

In our study, a germ was only found in 39% of cases, and most often it was staphylococcus followed by streptococci, which mainly concerned the RHD group.

Only 8 patients in total (9.2%) benefited from surgery for hemodynamic or infectious indications.

There were 11 deaths (23%) in the RHD patients and 9 deaths (22.5%) in the NRHD patient group.

Discussion:

The proportion of RHD in our population was 54%, which is close to the 52% in the systematic review by Noubiap published in The Lancet in 2022, which included five prospective studies relating to infectious endocarditis in Africa. A relatively low proportion compared to studies carried out in South Africa on IE where RHD concerned 72% and 80% of the population. Compared to other more socio-economically developed continents, in Auckland , only 14% of IE had rheumatic disease, but in Australia , IE was more common in people with RHD; note there was a proportion of Indigenous Australians. But unlike this study where EI was more common in men, there was no gender difference in our study. Rheumatic heart disease is actually identified in only 3% of patients with infective endocarditis in high-income countries.

Regarding the average age of patients with IE with RHD, it was relatively young in our study (39.7 years) and was similar to other studies, with 37.7 years in South Africa , and 45 years for RHD Australian patients, which was 19 years younger than for non-RHD patients .

Same in the meta-analysis on African countries with a mean age of less than 40 years.

Structural heart diseases, especially valvular diseases, are well-established risk factors for infective endocarditis. That is the reason why 23% of our RHD patients already had a history of IE.

We found the same thing in other studies, notably in New Zealand, where a previous IE was more common in RHD patients (27% vs. 5%) as well as in Australia where the history of a first endocarditis was a significant risk factor in this population.

Concerning the portal of entry, or the infectious source, our results were aligned with the African meta-analysis. In fact, their study revealed that in more than a quarter of patients with infective endocarditis, the potential source was dental (28.3%), and no potential source of infection was reported in 45·1% of patients. Thus, the burden of infective endocarditis in Africa may be significantly decreased by primary health care interventions for the primary and secondary prevention of acute rheumatic fever and rheumatic heart disease, for better oral hygiene and access to dental care. However, a risk factor that differs is the use of intravenous drugs, in fact, if in our country it only concerned 5% of the population, in the meta-analysis it was not unusual. While still far lower than in other continents like Europe or North America, or even Australia where it was on of the commonest risk factors for IE, intravenous drug use is becoming more common in African nations. In fact, in many African settings, there has been a notable increase in the frequency of infective endocarditis linked to intravenous drug use ; something we did not find in Morocco. However, the fact that drug use in our population was only found among NRHD is symbolic in relation to our Moroccan population in the process of development where there persists a large proportion of RHD where the entry point is rather dental and where there is another part of the population which is closer to developed countries where the risk factor is more drug injection.

Unfortunately, in our population, in most cases (61%), we did not find any germs. Same in South African cohorts, where there was a significant incidence of culture-negative. Our results are also consistent with the African meta-analysis, where blood cultures were positive in 48·6%, with Staphylococcus species (41.3%) and Streptococcus species (34.0%) as the most commonly identified microorganisms. This is how it was mentioned in the meta-analysis that the range of pathogenic microbes has shifted, with Staphylococcus species now predominating as opposed to Streptococcus species a few decades ago in Africa. In contrast to earlier research that claimed the most frequent cause of infective endocarditis in low- and middle-income nations was streptococci. In fact, in the South Africa Study, Oral viridans-caused streptococcal infection (IE) was still the most frequently documented cause. The high incidence of streptococcal infective endocarditis in our population is in line with the finding that a significant number of patients had a dental source of infection. These results emphasize how crucial it is for patients to have antibiotic prophylaxis. The combination of poor dental hygiene and the prevalence of rheumatic valve disease in underdeveloped nations creates the ideal environment for the emergence of IE. Bacteremia is caused by these oral cavity commensals entering the bloodstream through the mucosa. Individuals who have regurgitant lesions and underlying RHD make the ideal nidus for bacteremia patients to develop IE. A shift in the microbiology of IE has occurred at the same time as changes in patient characteristics and risk factors. Based on our study and the meta-analysis, staphylococci—which are typically linked to invasive operations and health-care interactions—have surpassed streptococci as the most common causal organism not just in industrialized countries but also in African countries. Important issues with staphylococcal infective endocarditis include its severe form, which frequently results in the formation of an abscess, and its propensity for staphylococci to develop drug resistance, with methicillin-resistant strains emerging as a major worldwide health concern. However, these findings should be taken with caution, given the prevalence of negative cultures. These frequently negative cultures are most often due to prior antibiotic use or poor blood culture collection.

In our study, the surgery rate was similar to that of the study done in the capital of Morocco (7%) . A rate that remains relatively low compared to other African studies (49.7%) . A possible explanation lies in the sampling, where they also included children.

Finally, the mortality rate was similar whether in other African countries (22.6%) or in the Moroccan capital (23%). Note that in our study, there was no difference in the mortality rate between the RHD and NRHD groups, despite the significant age difference. This is similar to what was found in the RHD population in Australia.

Conclusions:

Our study indicates that IE still affects young participants in Morocco and is associated with rheumatic valve disease. In terms of this disease, Morocco and the rest of Africa still have a long way to go because the epidemiological profile there does not reflect the changes that have occurred in the West. In fact, we have run into a number of obstacles that have demonstrated how difficult it is to provide healthcare in our nation, such as the high percentage of unidentified entry points, blood cultures that frequently come back negative because of subpar conditions, or even the absence of access to early surgery. Therefore, enhancing the prevention of acute rheumatic fever and forming an "endocarditis heart team" to adapt global guidelines for local populations will be the foundations of better care.

Acknowledgement

No

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