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Descriptive Epidemiological, Clinical and Microbiological Features of Infective Endocarditis in Saudi Arabia

*Mohamed Nabil Alama**

Department of Medicine, Faculty of Medicine, King Abdulaziz Hospital, King Abdulaziz University, Jeddah 21589, Saudi Arabia

Abstract

Objective: The present study describes the microbiological, clinical, echocardiographic and complications of infective endocarditis (IE) at the King Abdulaziz University Hospital (KAUH), Jeddah, Saudi Arabia. Retrospective epidemiological study from year 2016 to 2017 for all patient whereas diagnosis with infective endocarditis. The inclusion criteria any patient diagnosed with IE among adult patient and the exclusion criteria pediatric patient. Data was collected demographic, clinical and microbiology information and all data were entered to SPSS version 21 considering patient confidentiality. Continuous variables were compared with the Mann–Whithney U test and categorical variables with the x2 test or Fisher's exact test. In order to assess linearity, the quadratic age effect has been introduced in the model. The total number of patient diagnosed with IE was 28 cases, the average age is 48 (±18) years old, IE most common in male gender 21 (75%) compared to female 7 (25%), prevalence of disease higher among non-Saudi 21 (75%) compared to Saudi 7 (25). The patient clinical classification were acute (53%) phase are more frequent than sub-acute (48), moreover those underwent medical treatment are (93%) compared to surgical treatment. All the differences were statically almost significant ($P = 0.06$).

Conclusion, my results demonstrate the epidemiological, microbiological and clinical profiles of IE in a tertiary hospital in Jeddah, Saudi Arabia. The highest risk factors were surgical intervention and heart disease and lower among patient with prosthetic heart valve.

Keywords: Microbiological features; Epidemiology; Infective endocarditis; Saudi Arabia

Introduction

Infective Endocarditis (IE) is a microbial infection of heart valves and its endothelial lining which is considered as a life-threatening disorder [1-4]. Although the IE rate was low, the disease was still dangerous due to of hard diagnosis and treatment with high mortality. The occurrence of IE varied greatly. In countries with high industries, and higher degenerative heart disease a low rheumatic heart disease have resulted in aging patient, and high incidence of infections of Staph. Aureus, which is transmitted basically from healthcare [5-7]. The identification rate of the causing agents in the developed countries is recorded to be very high, while it is lower in the developing countries [8-12]. IE has different etiological factors, manifestations clinically, and treatment course in different gender and ages. In study carried out [13-15] on *S. aureus*, which has become the main causes in the developed world, leading to sever type of the disease in aged patient. Diagnosis and treatment of IE is still a challenge for physicians. Group of patients with the worst prognosis is treated by cardiologist and infectious diseases physician etiologic agent cannot be identified in a substantial number of patients. There is lacking information about the prevalence of IE &causes from Saudi Arabia, So, the present study describes the microbiological, clinical, echocardiographic and complications of infective endocarditis (IE) at the KAUH hospital, Jeddah, Saudi Arabia.

Setting

KAUH is tertiary and teaching hospital affiliated to medical school in Jeddah city at Saudi Arabia. The bed capacity 750 which including all services total number of discharge patient per year was 45,182 Patients.

Methodology

Retrospective epidemiological study from year 2016 to 2017 for all patient whereas diagnosis with infective endocarditis. The inclusion criteria any patient diagnosed with IE among adult patient and the exclusion criteria pediatric patient. Data was collected demographic, clinical and

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Correspondence:
Mohamed Nabil Alama, Department of Medicine, Faculty of Medicine, King Abdulaziz Hospital, King Abdulaziz University, Jeddah 21589, Saudi Arabia; E-mail: dr_nabilalama@yahoo.com

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Table 1: Demographic data for IE patient.

Gender No (%)	Male 21 (75)	Female 7 (25)
*Age no (± SD)	Male 50 (±16)	Female 43 (±12)
Nationality No (%)	Saudi 7 (30)	Non-Saudi 28 (70)
Clinical classification No (%)	Acute 21 (75)	Sub-acute 7 (25)
Treatment No (%)	Medical 20 (71)	Surgical 8 (29)

Fisher exact test, *P*=0.06

Table 2: Co-morbidity associated with IE.

Co-morbidity diseases No = 28	Freq (%)
DM	11 (28)
HTN	12 (30)
IHD	12 (36)
COPD	3 (8)
Asthma	0 (0)

Fisher exact test, *P*=0.05

Table 3: Sign & Symptoms associated IE.

Signs& symptoms No = 28	With symptoms Freq (%)
Chills	8 (20)
Malasia	6 (15)
Anorexia	22 (55)
Wight loss	20 (50)
Arthralgia	4 (10)
Shortness of breath	19 (48)
Cough	16 (40)
Chest pain	11 (27)
Back pain	7 (18)
Petechiae	3 (7)
Roth spot	2 (5)
Clubbing	2 (5)
Splenomegaly	7 (18)
Signs of ocular neuro	11 (27)
Raised JVP	7 (18)
Stiff neck	0 (0)
Delirium	4 (10)
gallop	3 (7)
Arrthmia	8 (20)

Fisher exact test, *P*=<0.005

microbiology information all data were entered to SPSS version 21 considering patient confidentiality. Continuous variables were compared with the Mann-Whitney U test and categorical variables with the x2 test or Fisher's exact test. In order to assess linearity, the quadratic age effect has been introduced in the model, and it was not found statistically significant.

Result

The total number of patient diagnosed with IE was 28 cases, the average age is 48 (±18) years old, IE most common in male gender 21 (75%) compared to female 7 (25%), prevalence of disease higher among non-Saudi 21 (75%) compared to Saudi 7 (25). The patient clinical classification were acute (53%) phase are more frequent than sub-acute (48), moreover those underwent medical treatment are

Table 4: Microorganism isolated from IE patients.

Microorganism	Freq (%)
Staphylococcus arues	12 (42)
Streptococcus viridans	8 (29)
Other streptococcus	2 (7)
Cogalse negative Staphylococcus	2 (7)
HACEK	3 (11)
Enterococcus	1 (3.5)
Total	28 (100)

Table 5: Complication of IE.

Risk factor No = 28	Out come Freq (%)
Valve dysfunction	33 (83)
Vegetation	22 (55)
Large more than 10 mm	11 (27)
Multiple	7 (17)
Normal cyticapnia	11 (27)
Ischemic or MI diseases	9 (23)
Heart block	4 (10)

Fisher exact test, *P*=< 0.005

Table 6: laboratory result of IE.

Risk factor No = 28	With IE Freq (%)
High WBC	24 (60)
Thrombocytopenia	15 (38)
High ESR level	26 (65)
High CRP level	20 (72)
High creatinine level	19 (47)
Prolonged PT	21 (53)
Prolonged PTT	28 (55)
Protein urea	3 (7)
TTE	35 (88)
TEE	8 (13)

P=< 0.005

(93%) compared to surgical treatment (Table 1). All the differences were statically almost significant (*P* = 0.06). Table 2 shows patient diagnosed IE with Co-morbidity the HTN and DM are common (12 and 11) respectively however these differences statistically significant (*P*= 0.05). Sign and symptom were shown in table 3 that anorexia (55%) followed by weightless (50%), shortness of breath (48%) were common among IE patient and these differences were statistically significant. Table 4 present the most common organism caused IE were *Staphylococcus arues* (40%) followed by *Streptococcus viridians* (30%). The risk factor associated IE presented in table 5 those cases under went TTE procedures (88%) followed surgical intervention (28%) where high risk to have IE compared to other factor, these differences was statistically significant. Table 5 shows the complication affected patient with IE were valve dysfunction (83%) followed by vegetation (55%). Table 6 shows the laboratory result that patient with IE has high CRP (70%) and high ESR (65%).

Discussion

IE means surface infection of cardiac endothelium suggesting physical presence of microorganisms in the lesion and heart infection. IE is a serious and life-threatening condition, which may lead to

death if untreated. Today, despite the medical and technological advancements in the field of pharmaceutical therapies of microbial infections and advanced surgical procedures, the mortality rate related to IE has not decreased. This disease is more dominant in intravenous addicts and cardiovascular patients, specifically heart valve replacement patients [16]. Despite its rare occurrence, infective endocarditis (IE). In the general population, IE is generally low and uncommon disease associated with significant morbidity and mortality and appears to vary greatly among different populations even within the same country. Its incidence in the present. Multiple factors could have led to variability in IE incidence, including referral and case ascertainment biases, disease misclassification, differences in populations at risk, study designs, and use of different case definitions. IE is an uncommon disorder that was almost universally fatal in the preantibiotic era, and remains a major clinical problem today, despite advances in medical and surgical treatments study on Infective endocarditis: Clinical features and prognosis in a non-teaching hospital and results showed IE remains a severe disease and S. aureus is more often involved... In one study conducted in Italy found the incidence rate of IE is 4.6/100,000/y [17]. In the present study, the highest risk factors were surgical intervention and heart disease and lower among patient with prosthetic heart valve (10%) our finding similar to one study focused on surgical intervention as risk factors and establish scoring system for those patients the predominant complication affected patient with IE were valve dysfunction (83%) followed by vegetation (55%). Moreillon and Murdoch reported that CHF has the most serious effect on prognosis of IE. Microorganism isolated from IE patients was S. aureus accounting for 42 % of all the infections, followed by streptococcus viridians, other streptococcus, cogalse negative Staphylococcus and Enterococcus. These results were in agreement with [18,19]. In this study showed the male are higher compared the female gender, the mean age of patients with IE has increased the average age among cases Male was 50 (±16) and Female 43 (±12), numerous studies showed the IE are common among elderly and recent studies of IE in Turkey have found it to be between 45 and 51 years [20-22]. Other predisposing conditions for IE, such as the presence of Prosthetic heart valve, Structure heart disease, Noncompliance dental hygiene, surgical intervention. Previous diagnosis IE, Hospital acquired infection were the same as identified in other studies. The non-Saudi cases more frequent than Saudi the reason most of KAUH population from other nationality because we are only governmental hospital accepting other nationality. The chronic diseases associated with IE are 12% of cases were having IHD, 12% have hypertension and 11% have diabetes mellitus. Sign and symptoms associated with IE as the following chills, malasia, anorexia, and weight loss, and arthralgia, shortness of breath, cough, chest and back pain. Around 55% of our patient had anorexia and 50% weight loss only 10% complained from arthralgia [23].

Conclusion, my results demonstrate the epidemiological, microbiological and clinical profiles of IE in a tertiary hospital in Jeddah, Saudi Arabia. The highest risk factors were surgical intervention and heart disease and lower among patient with prosthetic heart valve.

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