Original Article

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MANAGEMENT OF INFECTIVE ENDOCARDITIS IN TERTIARY CARDIAC CARE HOSPITAL

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ABSTRACT

Objective: To evaluate the management and in-hospital outcomes of the patients of infective endocarditis in tertiary cardiac care hospital.

Study Design: Descriptive cross-sectional study.

Place and Duration of Study: Adult Cardiology Departments of AFIC / NIHD from 1st August 2013 till 31st August 2015.

Material and Methods: Eighty Four patients with infective endocarditis were included in the study using consecutive sampling technique. Infective endocarditis registry by R & D Department was used as a data collection tool.

Results: There were total 84 patients with infective endocarditis, out of which 51.0% (n= 43) were males and 49.0% (n= 41) were females. Mean age was 36.24 ± 15.3 years and mean BMI was found to be 22.68 ± 3.9. Most patients with infective endocarditis had no heart valve disease 41.6%, followed by patients with rheumatic heart disease 39.2% (n=33). Most prevalent co-morbidity was hypertension 30.6% while most Common symptom of the patients was fever 97.5% (persistent fever 63% and intermittent 34.5%). Vegetations were found in all patients. Blood culture was positive in 51% of patients and the most common organism was streptococcus 72%. Mortality of the infective endocarditis patients was 38% (n=32). Causes of mortality were death after surgery, late Presentation of with Complications, death before surgery, unwillingness for the surgery and death due to other causes. Most common cause of death was late presentations of the patients with complications (19%).

Conclusion: Infective endocarditis is a disease with high mortality. Appropriate provision of healthcare facilities, improved health awareness, early diagnosis of infective endocarditis, use of appropriate antimicrobials and early surgical intervention can improve the outcomes significantly.

Keywords: Infective endocarditis, Rheumatic heart disease, Co-morbidity, Vegetation.

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INTRODUCTION

Infective endocarditis is a disease that needs a comprehensive approach for its management, because is not a single disease, but rather may present with very different aspects depending on the first organ involved, the underlying cardiac disease, the microorganism involved, the presence or absence of complications and the patient's characteristics[1]. Main clinical symptoms might be cardiac, rheumatological, infectious, neurological or other. A very high level of expertise is needed for management of patients with infective endocarditis including cardiologists, cardiac surgeons, microbiologists, neurologists and neurosurgeons. Echocardiography is known to have a major importance in the diagnosis and management of infective endocarditis[2]. However, other imaging techniques, including magnetic resonance imaging (MRI), multi-slice computed tomography (MSCT), and nuclear imaging, have also been shown to be useful for diagnosis, follow-up and decision making in patients with infective endocarditis. About half of the patients with infective endocarditis undergo surgery during the hospital course. Early discussion with the surgical team is important and is considered mandatory in all cases of complicated infective endocarditis i.e. endocarditis with heart failure, abscess or

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embolic or neurological complications[3].

The diverse nature and evolving epidemiological profile of infective endocarditis consider a range of alternative diagnoses. Up to 90% of patients present with fever, often associated with systemic symptoms of chills,

Table-1: Presenting complaints and symptoms of the patients with infective endocarditis.

Variables	Valve n (%)	Percentage (%)
Age (Mean ± S.D)	36.24 ± 15.32 Years	
BMI (Mean ± S.D)	22.68 ± 3.95	
Gender		
Male	43 (51.0%)	51.0%
Female	41 (49.0%)	49.0%
Underlying Heart Valve Disease		
Rheumatic Heart Disease	33 (39.2	39.2%
Infective Endocarditis of Prosthetic Valve	12	14.2%
Congenital Heart Disease	3	3.5%
Atrial Myxoma	1	2.0%
Co-morbidities		
Hypertension	39	30.6%
Diabetes	10	10.2%
Stroke	1	2.0%
COPD	5	4.0%
Renal Impairment	7	8.1%
Smoker	14	12.2%
Symptoms:		
Fever		
Persistent	53	63.0%
Intermittent	29	34.5%
Dyspnea		
NYHA Class I	5	5.9%
NYHA Class II	15	22.4%
NYHA Class III	25	29.7%
Weight Loss	67	80.1%
Musculoskeletal pains	59	70.5%

ensure that it remains a diagnostic challenge depending upon the causative organism[4]. Patients with the highest risk of infective endocarditis can be placed in three categories, patients with a prosthetic valve or with prosthetic material used for cardiac valve repair, patients with previous infective endocarditis and patients with untreated cyanotic congenital heart disease (CHD) and those with CHD who have postoperative palliative shunts, conduits or other prostheses. The clinical history of infective endocarditis is highly variable according to the causative microorganism, the presence or absence of pre-existing cardiac disease, the presence or absence of prosthetic valves or cardiac devices and the mode of presentation. It may present as an acute, rapidly progressive infection, but also as a sub-acute or chronic disease with low-grade fever and non-specific symptoms[5]. Patients may present to a variety of specialists who may poor appetite and weight loss. Heart murmurs are found in up to 85% of patients. Up to 25% of patients have embolic complications at the time of diagnosis[6].

Besides the pathological aspect obtained after valve surgery, in clinical practice the diagnosis of infective endocarditis usually relies on the association between an infective syndrome and recent endocardial involvement. This is the cornerstone of the various criteria proposed to facilitate the difficult diagnosis of this disease Thus, in 2000, the modified Duke criteria were recommended for diagnostic classification.

These criteria are based on clinical, echocardiographic and biological findings, as well as the results of blood cultures and serologies[7]. This classification has a sensitivity of approximately 80% overall when the criteria are evaluated at the end of patient follow-up in epidemiological studies. However, the modified

Duke criteria show a lower diagnostic accuracy for early diagnosis in clinical practice, especially in the case of prosthetic valve endocarditis (PVE) and pacemaker or defibrillator lead infective endocarditis, for which echocardiography is normal or inconclusive in up to 30% of cases[8]. Successful treatment of IE relies on microbial eradication by antimicrobial drugs. Surgery contributes by removing infected material , draining abscesses and valve repair/ replacement[8].

developed for demographics of the patients as well as symptoms, clinical characteristics and in hospital short term outcomes of the patient. Formal approval for the study was taken from Institutional Ethical Review Board AFIC & NIHD.

Data was analyzed using SPSS-21 version. Quantitative variables were describes with mean ± S.D while qualitative variables were described with frequency and valid percentages.

Table-2: Echo findings and blood culture/sensitivity findings of the patients.

Variables	Frequency	Percentage
Echo findings:		
Vegetation	84	100%
Abscess	10	11.9%
Perforation	5	5.9%
Para-vavular Leak	9	10.7%
EF		
50	34	38.7%
30-50	27	32.6%
< 30	23	28.5%
MR		
I	7	8.2%
II	21	24.5%
III	21	24.5%
TR		
Mild	5	4.1%
Moderate	5	4.1%
AR		
I	9	10.2%
II	9	10.2%
III	16	18.4%
III+IV	10	11.9%
Blood C/S		
Positive	43	51.0%
Negative	41	48.9%
Causative Organism		
Streptococcus	31	72.0%
Staphylococcus	8	20.0%
E.coli	4	8.0%

MATERIAL AND METHODS

A Retrospective analysis was carried out from 1st August 2013 till 31st August 2015 using infective endocarditis registry by R&D Department. Data was collected in department of Adult Cardiology, AFIC& NIHD, Rawalpindi. Consecutive sampling technique was used for recruitment of the patients. All the patients with infective endocarditis were included the study.

Clinical registry of infective endocarditis was used as data collection tool which was

RESULTS

There were total 84 patients with infective endocarditis, out of which 51.0% (n= 43) were male and 49.0% (n= 41) were female. Mean age was 36.24 ± 15.3 years and mean BMI of the patients was found to be 22.68 ± 3.9 as shown in table-1.

The underlying heart valve diseases were rheumatic heart disease, infective endocarditis of prosthetic valve, congenital heart disease and atrial myxoma. Most patients with infective

endocarditis had no heart valve disease 41.6% (n=35), followed by patients with rheumatic heart disease 39.2% (n=33). Co-morbidities were found to be hypertension, diabetes, stroke, chronic obstructive pulmonary desease (COPD), renal impairment, Smoking history, IV drug usage, Hepatitis C and Tuberculosis , Coarctation of aorta and pregnancy. Most prevalent co-morbidity was hypertension 30.6% (n=39), followed by diabetes 10.2% (n=10). Most (n=39) and renal failure 30.9% (n=26) as shown in table-3.

Mortality of the infective endocarditis patients was 38% (n=32). Causes of mortality were death after surgery, late presentation of with complications, death before surgery, unwillingness for the surgery and death due to other causes. Most common cause of death was late presentations of the patients or due to complications 19% (n=16).

Table-3: Complications & mortality in patients with infective endocarditis.

Variables	Frequency	Percentage
Complications:		
Stroke	7	8.3%
Heart Failure	39	46.4%
Renal Failure	26	30.9%
Septic Emboli	6	7.1%
Splenic Abscess	1	1%
Lung Abscess	2	2.3%
Pericardial Effusion	2	2.3%
Aortic Root Abscess	10	11.9%
Perforations	5	5.9%
Arrhythmias	2	2.3%
Peripheral Embolism	1	1%
Mortality	32	38%
Mortality after surgery	5	5.9%
Late Presentation	16	19%
Death before surgery	6	7.1%
Unwilling for surgery	3	3.5%
Death due to other causes	2	2.3%

Common symptom of the patients was fever (n=82) 97.5% (persistent fever 63% and intermittent 34.5%) and weight loss 80.1% (n=67).

Most common clinical presentation was vegetation, found in all patients (n=84). Ejection fraction was more than 50 in 38.7% patients, 30-50 in 32.6% patients and less than 30 in 28.5% of the patients. Blood culture was positive in 51% (n=43) patients and most common organism was streptococcus 72% (n=31), then staphylococcus 20% (n=8) and E.Coli 8% (n=4) as show in table-2.

Complications among patients were found to be stroke, heart failure, renal failure, septic emboli, splenic abscess, lung abscess, pericardial effusion, aortic root abscess, perforations, arrhythmias, peripheral embolism. The most common were heart failure 46.4%

DISCUSSION

Infective endocarditis remains a diagnostic as well as therapeutic challenge and associated with significant mortality especially in our setup due to limited healthcare facilities and delayed diagnosis[9]. Its clinical manifestations may be muted by the indiscriminate use of antimicrobial agents or by underlying conditions in frail, elderly individuals or immunosuppressed persons. It is not an uncommon disease in our population[10]. Male predominance, young age and high mortality are the main aspects observed in this study as has been reported elsewhere by researchers of our region[10,11]. In this study mean age of patients was found to be 36 years with majority of the patients being less than 40 years, while in Western countries mean age of presentation with infective endocarditis has increased from

58.6 years to 60.8 years, with more than 50% patients above 50 years age[12,13]. One possible reason for infective endocarditis being common in younger age group in our population, is the prevalent underlying rheumatic and congenital heart diseases. While improved healthcare facilities and better awareness has led to the decreasing trends in mortality and increasing age of presentation in Western world[13].

Infective endocarditis remains common in males as is reported in local and international literature with no racial predilection probably due to socioeconomic bias particularly in our region[2]. Clinical characteristics and laboratory features in our study are comparable to other reported studies with fever being the most common symptom and vegetations on the valves being commonest finding on echocardiogram[8]. Mitral valve was predominantly involved with the infective process because of it being most commonly involved in rheumatic heart disease[9,14,15].

In this study 48.9% of patients were found to be culture negative, which is quite high percentage consistent with other studies from developing countries[8,9,12]. Most common reason behind this low positivity of cultures is probably unjustified use of antibiotics in our setup, with significant association was found between previous intake of antibiotics and culture negative endocarditis. The most common organism cultured was streptococcus and staphylococcus being the second most common which is consistent with local and international studies[1,6,8,9]. Mortality was around 38%, which relatively high considering the international statistics[10,13,16]. Major reasons behind this high mortality are delayed presentations and late diagnosis leading to complications and multi-organ failure. Mortality after the surgical interventions was 12%, the reflecting role of early surgery in appropriate candidates.

CONCLUSION

Infective endocarditis remains disease of younger age group in our setup, with high mortality due to lack of awareness, delayed presentation and complications and inadequate healthcare facilities especially at the remote areas. Appropriate provision of healthcare facilities, improved health awareness and knowledge about the early diagnosis of infective endocarditis, use of appropriate antimicrobials and early surgical intervention in appropriate candidates can improve the outcomes significantly.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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