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RISK FACTORS AND FREQUENCY OF VALVE INVOLVEMENT IN NATIVE VALVE ENDOCARDITIS

1. **RAJ KUMAR SACHDEWANI**
M.B.B.S., Dip: Cardiology, (M.D Cardiology)
2. **NAND LAL RATHI**
M.B.B.S., Dip: Cardiology, (M.D Cardiology)
3. **MUZAFFAR A. SHAIKH**
M.B.B.S., M.D (Medicine), D.T.C.D
4. **NAZIR AHMED MEMON**
M.B.B.S., FRCP, FACC
5. **NARINDER MAHESHWARI**
M.B.B.S., F.C.P.S. Resident)
6. **DARSHANA KUMARI**
Final year M.B.B.S. Student

1. ***Registrar (PG Student)***
Departemtn of Cardiology
LIAQUAT UNIVERSITY OF MEDICAL & HEALTH SCIENCES (LUMHS) JAMSHORO, SINDH, PAKISTAN
2. ***Registrar (PG student)***
Department of Cardiology
LIAQUAT UNIVERSITY OF MEDICAL & HEALTH SCIENCES (LUMHS) JAMSHORE, SINDH
3. ***Associate Professer***
Department of Medicine
LIAQUAT UNIVERSITY OF MEDICAL & HEALTH SCIENCES (LUMHS) JAMSHORO, SINDH, PAKISTAN
4. ***Professor***
Department of Cardiology
LIAQUAT UNIVERSITY OF MEDICAL & HEALTH SCIENCES (LUMHS) JAMSHORE, SINDH
5. ***Resident Medical Officer***
Departemtn of Medicine
LIAQUAT UNIVERSITY OF MEDICAL & HEALTH SCIENCES (LUMHS) JAMSHORO, SINDH, PAKISTAN
6. ***Student Final Year***
LIAQUAT UNIVERSITY OF MEDICAL & HEALTH SCIENCE (LUMHS) JAMSHORE, SINDH

Correspondence:
MUZAFFAR A. SHAIKH
M.B.B.S., M.D (Medicine), D.T.C.D
Associate Professer
Department of Medicine
LIAQUAT UNIVERSITY OF MEDICAL & HEALTH SCIENCES (LUMHS) JAMSHORO, SINDH, PAK.
E-mail: drmuzafarali@hotmail.com
Phone: 0300-9374664

ABSTRACT

OBJECTIVE: *To determine the risk factors and frequency of valve involvement in patients with Native Valve Endocarditis.*
STUDY DESIGN, PLACE AND DURATION: *Hospital based Descriptive observational study, Department of Cardiology and department of Medicine, Liaquat University Hospital Hyderabad form July 2005 to December 2007.*
PATIENTS AND METHODS: *A 56 consecutives patients, who presented with fever, joint pain, dyspnoea, history of Rheumatic fever, previous history of IE, history of I/V drug abusiveness were studied by taking history, clinical examination, and routine investigation. 03 blood samples were taken and sent to the laboratory for culture and sensitivity. All patients were evaluated by Doppler echocardiography on day 2, at 14 day, at one month and on 6th week of treatment, Treatment was stared according to their blood culture and sensitivity. Descriptive and inferential statistical analysis was performed using SPSS version 16.0.*
RESULT: *Males out numbered females with ratio 37(66.1%) / 19(33.9%). Definite vegetation was present in 40/56(71.4%) but definite culture positive cases were 30/56 (53.6%). Mitral valve was most commonly affected 21(37.5%) followed by aortic valve 18(32.1%). Tricuspid valve was found to be affected in 4/56(7.1%). Major risk factors of Native Valve Endocarditis were Diabetes Mellitus in 11(19.6%), Hypertension was present in 15(26.8%), history of Rheumatic heart disease was present in 32(57.1%) cases, smoking in 26(46.4%) and previous history of infective endocarditis in 08(14.3%) cases.*
CONCLUSION: *The adult males suffer more from Native Valve Endocarditis. Recognition of different causes and prompt treatment is important to prevent complications in our setup. Proper measures and patient education is important to decrease the risk factors for development of native Endocarditis.*

KEY WORDS: Infective Endocarditis, Native Valve, Vegetation.

INTRODUCTION:

Infective endocarditis (IE) is microbial infection of the endothelial surface of the heart. The characteristice lesion, the vegetation is a variably sized mass of platelets and fibrin in which abundant micro-organisms and moderate inflammatory cells are enmeshed. Native Valve Endocarditis (NVE) is an infection of native heart valve or other cardiac structure, whether or not it was previously normal or damaged by acquired or congenital disease. The Intarcardiac effects of the infection include severe valvular insufficiency, which may lead to intractable congestive heart failure and myocardial abscesses. IE not only affects the heart but also produces a wide variety of systemic signs and symptoms through several mechanisms, including both sterile and infected emboli and various immunological phenomena.

The investigation and management of infective endocarditis in the developed world have changed radically over the past 30years.[1,3] Non-invasive imaging, molecular science, diagnostive protocols, and curative surgery have all become common place, yet the incidence remains unchanged and annual mortality approaches 40%.[2,3].

The incidence of infective endocarditis is approximately 1.7-6.2 cases per 100,000 patient years[4], although rates are higher in at risk cohorts such as intravenous drug users. Changes in the etiology, epidemiology, and outcome of infective endocarditis (IE) have been observed in recent years. In NVE , the number of cases that are hospital acquired has been increasing during the last 15 years. These cases are frequently associated with

invasive intravascular procedures or IV catheter-related infections. Most patients have a previous valvulopathy that predisposes to IE. The spectrum of micro-organisms involved is different from the community-accuired cases. Also, the outcome of endocarditis is worse in nosocomial NVE patients. In patients with enterococcal endocarditis, nosocomial acquisition of infection is an important factor determining outcome. As the incidence of bacteraemia and the population of elderly people at risk continue to grow, the hazard of acquiring nosocomial enterococcal endocarditis may increase; hence, major emphasis must be put on prevention.

PATIENTS AND METHODS:-

This was hospital based Descriptive observational study in which we examined thoroughly total number of 56 consecutive patients diagnosed as native valve endocarditis admitted in the cardiology and medicine department of Liaquat University of medical and Health Science during 30 months perid (July 2005 to December 2007). All patients with Native Heart Valve, those patients who met the definite modified Dukes criteria of Infective Endocarditis through (a) Clinical parameters, (b) Echocardigraphic findings, (c) Blood culture findings were included and patients with prosthetic heart valve, those who met the probable and rejected Dukes criteria but did not meet the definite criteria, who responded within three days of the treatment and in whom the firm alternate diagnosis of IE was present were excluded from the study.

All admitted patients who presented with fever, joint pain, dyspnoea, history of Rheumatic fever, previous history of IE, history of I/V drug abusiveness were thoroughly studied by taking detailed history, clinical examination, routine investigation e.g: X-ray chest, blood complete picture, urine analysis, blood sugar, blood urea and S. Creatinine by the research diagnostic lab Liaquat University Hospital Hyderabad.

Three samples of blood drawn from different sites taken in 24 hours with at least one hour apart of the suspected patients of IE were sent to the laboratory for culture and sensitivity. The blood samples were incubated for 48 to 72 hours on sticking and Swab play method. The organism and their sensitivity were noted.

A 2-D, echocardiography examination was performed on TOSHIBA nemio 35 with colour Doppler. Patients were serially evaluated by two dimensional and Doppler exhocardiography on day 2, at 14 day of treatment at one month of treatment and

TABLE – I

BASELINE PROFILE OF THE PATIENTS OF NATIVE VALVE ENDOCARDITIS (N = 56)

Age (in years, Mean + SD (Range)	23.13 + 11.3(6-60)
GENDER:	**n(%)**
Male	37(66.1%)
Female	19(33.9%)
Valve Affected:	
Aortic valve	19(32.1)
Mitral valve	21(37.5)
Tricuspid valve	4(7.1)
Mixed (MR + AR) valves	8(14.3)
Ventricular septum	5(8.9)
Causative agent of IE:	
Streptococcus- viridans	14(25.0)
Staphylococcus aureus	11(19.6)
Streptococsus Bovis	1(1.8)
Streptococcus Sangius	3(5.4)
Streptococcus epidermidis	3(5.4)
Possible positive	6(10.7)
Negative	18(32.1)

TABLE – II

DISTRIBUTION OF CSES ACCORDING TO NVE DIAGNOSTIC CRETERIA (N = 56)

MAJOR CRITERIA:	**n(%)**
Vegetations	
Yes	40(71.4)
No	16(28.6)
Blood Culture:	
Positive	30(53.6)
Negative	26(46.4)
MINOR CRITERIA:	
Fever	56(100)
Pre-disposing cardiac condition	52(92.9)
IV Drug Abuser	04(7.1)
Janeway's Lesion	3(5.3)
Intracranila haemorrhage	3(5.3)
Osler Nodes	4(7.1)
RA Factor	8(14.3)
Rothe Spot	3(5.3)
Possible vegetation	6(10.7)
Possible positive blood culture	9(16.0)

on 6th week of treatment. The diagnosis of vegetation was made when definite vegetation at the tip of mitral / aortic valve / tricuspid valve / at the site of septal defect was visible throughout the cardiac cycle in at least two different echocardiographic views. After the confirmation of the cases on the basis of Duke's criteria of Infective endocarditis having native valve were included in the study. In all these cases treatment was started according to their blood culture and sensitivity and in culture negative cases empirical therapy was started. Patients were very closely observed for the development of complications of infective endocarditis, especially heart failure during the course of their admission. Chest was also examined routinely for the presence of basal crackles.

DATA ANALYSIS:

The date were evaluated in statistical program SPSS (Statistical program for Social Sciences) version 15.0. Frquencies and percentages were calculated on 95% confidence interval. Mean Standard deviation are expressed for numerical parameter i.e. age. As this was descriptive study therefore no any statistical test was applied to calculate the P value.

RESULT:

In this study 56 cases of Native Valve Endocarditis were studied. Baseline profile including age, gender, site affected, causative gent and predisposing cardiac conditions were noted {Table I}.

Males out numbered females with ratio 37(66.1%) / 19 (33.9%). Mitral valve was most commonly affected 21(37.5%) followed by aortic valve 18(32.1%). Tricuspid valve was found to be affected in 4/53(7.1%) and all these patients were drug abusers. Mixed lesions affecting both mitral and Aortice valve were sen in 8(14.3%) whereas ventricular septum lesions were present in 5(8.9%).

Definite Vegetation was present in 40/56 (71.4%), but definite culture positive cases were 30/56 (53.6%) only 37 [Table II]. Out of definite culture positive (30/56) cases Streptococcus viridans was the most common culprit microorganism 14(25%) followed by Streptococcus aureus (19.6%). Strptococcus bovis was present in 1(1.8%) and Streptococcus enterococci was found in 3(5.4%), whereas no organism was detected in 18(56(32.1%) of the cases of native Valve Endocarditis and these cases were labeled as culture negative NVE.

Major risk factors of native Valve endocarditis were Diabetes Mellitus in 11(19.6%), Hypertension was present in 15(26.8%), history of Rheumatic heart disease was present in 32(57.1%) cases, smoking in 26(46.4%) and previous history of Infective Endocarditis in 08(14.3%) cases. 37 [Table III]. Development of complications were observed in 13/56(23.2%) patients. Congestive heart failure was the most common complication in all 13/56(23.2%) cases, followed by recurrent episodes of fever 8(14.3%) and valvular regurgitation 6(10.7%). Valver abscess in 3(5.4%) and Neurological complications were developed in 2(3.6%) for the cases.

TABLE – III

RISK FACTORS AND PREDISPOSING CARDIAC CONDITIONS IN STUDIED POPULATION (N = 56)

Risk Factors	**n(%)**
History of Rheumatic heart disease	32(57.1)
Smoking	26(46.4)
Hypertension	15(26.8)
Diabetes Mellitus	11(19.6)
History of Rheumatic heart disease	08(14.3)
Predisposing cardiac condition	**n(%)**
Acquired valvular disease	35(62.5)
Bicuspid aortic valve	4(7.1)
Mitral vale prolapse	8(14.3)
Congenital Heart disease	5(8.9)
No underlying cardiac condtion	4(7.1)

DISCUSSION:

Untreated infective endocarditis is one of the few universally fatal infectious diseases. The poor prognosis of the diseases is not only attributable to the considerable morbidity and mortality during the active phase of the disease, but also late complications and sequelae occurring once the infection has been eradicated. [4.5].

Prognosis in patients surviving the initial stages of infective endocarditis is dependent on three main factors: substantial risk of recurrence (recently estimated at 0.3 = 2.5 / 100 patient years); the need for valve replacement during follow up as a result of valve lesions caused or exacerbated by endocarditis, and lastly death particularly from heart failure [6,7].

In one local study conduced by Sher Reham et al[8]. on clinical presentation of infective endocarditis found that 90% of patients were below 40years, definite pre disposing factor for bacteraemia could be identified in 20%. Mitral valve was the most common valve affected in 18(60%) followed by Aortic and Triscuspid valve. 12 patients had the complications during the course of treatment. 100% patients had the predisposing cardiac lesion. In another study conducted by Masood Sadiq et al[9] showed the incidence of IE was 32 per 1000 hospital admissions in the children below 16 years. RHD was the underlying lesion in 53% and CHD in 45%. Blood cultures were positive in 47% while vegetation on Echo was present in 71% of the cases.

Improvements in microbiology techniques, together with the recent introduction and development of echo cardiographic techniques and expertise, have mad a substantial contribution to ensuring early diagnosis, providing accurate information no possible complications and their monitoring [10,11,12]. It is also reported that the microbiological profile causing IE has changed in western countries, where staphylococcus is now the most common pathogen [13,14,15]. Western studies noted, this change may have resulted from dental problems being less important as a focus for infective endocarditis. Consequently several studies have reported that dental procedures are not a risk factor for infective endocarditis in various heart diseases [16,17,18,19]. Masood Sadiq, Ahsan Wahed Rahore, Mohsin Nadi, Sheryar Sheikh observed that infective endocarditis is difficult to diagnose in a surprisingly high proportion of cases. This is particularly so in a developing country like Pakistan, where patients are referred late or treated with antibiotics before referral, there is low yield of blood cultures, and incidence of rheumatic heart disease is high. Patients in our setup usually receive antibiotic treatment before reaching hospital

which is usually late [20].

CONCLUSION:

In our study adult males sufer more from Native Valve Endocarditis then females. Mitral valve was most commonly affected followed by aortic valve. Recognition of different causes, risk factors and underlying cardiac lesions which results in development of Native valve Endocarditis. When suspected, early diagnosis and treatment is required to prevent morbidity and mortality and development of abnormal valves.

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