

Bacteriological profile of patients with infective endocarditis

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Introduction: The term infective endocarditis (IE) denotes infection of the endothelial surface of the heart and implies the physical presence of microorganisms in lesions. Although the heart valves are commonly affected the disease may also occur within the septal defects or in the mural endocarditis¹. IE is uncommon disease but it is fatal in untreated cases. This study was carried out in Shahid Gangalal National Heart Centre (SGNHC), Bansbari, Kathmandu during 30 October 2003 to 30 June 2004 among 34 patients diagnosed as definite cases of IE.

Materials and Methods: Blood culture for bacteria & antibiotic sensitivity tests were performed for each patient using standard microbiological protocol in Laboratory of SANHC. Echocardiography was done for each patient to confirm the case of IE. Questionnaires were fulfilled to get additional informations regarding the patients.

Results: We found positive blood culture in 14 (41.12%) out of 34. The frequency of isolated organisms were *Viridans streptococci* in 6 (42.85%) cases, *Staphylococcus aureus* in 3 (21.43%) cases, *Pseudomonas aeruginosa* in 2 (14.28%) case and Coagulase negative and *Staphylococci* (CONS) in 3 (24.41%) cases among positive blood culture. All Gram positive bacteria were susceptible penicillin, gentamicin, cephotaxime, ceftriaxone, vancomycin and ciprofloxacin.

Only less than 50% of Gram positive bacteria were susceptible to Amoxicillin, Ampicillin, Erythromycin and Cotrimoxazole. All Gram negative bacteria were susceptible to Ciprofloxacin, Tetracycline, Cotrimoxazole and Cephataxime. Only 50% of Gram negative bacteria were susceptible to Gentamicin. Ampicillin and Amoxicillin were found to be resistant with all Gram negative bacteria. Echocardiography records revealed vegetation in 27 (79.42%) cases of whom blood culture was positive in 12 (44.44%).

Conclusion: Blood culture and echocardiography are very useful for diagnosis and treatment of cases of IE.

Keywords: Infective endocarditis, echocardiography, antibiotic susceptibility test.

Introduction

IE is a serious microbial infection of the endocardium of heart, is a complex multifaceted disease that may affect any organ system. However the reporting criteria vary and many cases of rather doubtful validity IE accounted for one case per 1,000 hospital admission with range of 0.16 to 5.6 cases per 1,000 admissions in 1985². Estimation from the American Heart Association (AHA) places the annual incidence of IE at 10,000 to 20,000 new cases in United States. People who

have had rheumatic fever and those born with heart valves defects are at greatest risk for developing this problem. Many diverse species of bacteria, fungi, Mycobacteria, Rickettsia & Mycoplasma may cause IE; nevertheless, *Streptococci*, *Staphylococci*, *Enterococci*, fastidious Gram negative coccobacilli that reside in the oral cavity and upper respiratory tract cause the majority of cases of IE. The best definition of IE which is taken in this study is the Duke's Criteria; a sensitive and specific scheme relying on several criteria designated as minor and major. Major criteria include

blood culture persistently positive for typical endocardial pathogens and echocardiography evidence of IE. Minor criteria include predisposing heart condition or intravenous drug use, fever, splenomegaly etc. IE is important disease constituting 4-5 cardiologic admission per month in SGNHC, Bansbari, Kathmandu, a tertiary cardiac referral centre of Nepal. Since IE as the underlying heart disease in a significant number of patients with non-specific features, this study is an attempt to strengthen the understanding of diagnostic as well as treatment tools among the suspected cases.

Objective

Our aim was to find out bacteriological profile of bacteraemia and septicaemia among cases of IE and antibiotic susceptibility pattern of isolates to facilitate diagnosis and treatment of cases of IE.

Materials and Methods

The study was done in Microbiology laboratory of SGNHC with help of physicians from various Department of SGNHC. This is a cross-sectional descriptive study done for 8 months from 30 October 2003 to 30 July 2004. Total 34 patients were included in the study those who were diagnosed as definite case of IE. Blood samples from each patient were processed in laboratory using standard microbiology protocol and isolates from positive culture were followed for antibiotic susceptibility test using Kirby Baur Disc Diffusion method. Echocardiography records were analyzed. Predisposing factors, use of antibiotics, age, gender, occupation etc were collected for each patient by fulfilling questionnaires to collect information about patients.

Results

Out of 34 cases, the mean (\pm SD) age of patients was 34.14(\pm 15.45) years ranging from 11 to 64 years. All patients included under study were hospitalized patients and mean duration of hospital stay was 28 days. Rheumatic heart disease (RHD) was major predisposing factor. No one was found as IV drug abuser. Culture positive was found in 14 cases and isolates were *Viridans streptococci* in 6 cases, *Staphylococcus aureus* in 3 cases, *Pseudomonas aeruginosa* in 2 cases and CONS as possible pathogens in 2 cases. Monomicrobial growth was observed in all positive blood culture system. Antibiotic susceptibility test was performed for each isolate and Gram positive bacterial isolates were found to be susceptible towards Penicillin, Gentamicin, Cephalexime, Ceftriaxone, Vancomycin, Ciprofloxacin. Less than 50% of Gram positive bacteria were susceptible to Amoxicillin, Ampicillin, Erythromycin and Cotrimoxazole. All

Gram negative bacterial isolates were found susceptible to Tetracycline, Ciprofloxacin, Cotrimoxazole and Cephalexime. Only 50% of Gram negative bacteria were susceptible to Gentamicin. Ampicillin and Amoxicillin were found to be resistant with all Gram negative bacteria. Echocardiography records revealed vegetation in only 27 cases out of 34 which was the major criterion for confirmation of IE along with positive blood culture report. All patients were farmers coming from various part of countryside.

Discussions

Due to various atypical clinical manifestations, diagnosis of IE is facilitated by either positive blood culture report or positive echocardiography report. Either of these reports should be positive to include as major criterion for identification of cases of IE. Blood culture is more important since it further facilitated the treatment by administration of suitable antibiotic to the patients. Culture positive was found higher among patients (55%) those who were without use of antibiotic than those receiving antibiotic (21.43%) within 2 weeks during drawing of blood sample for culture. In our study, however, low grade recovery of growth of etiological agent among cases of IE may be due to large number of patients

(14 ie. 41.12%) using antibiotic orally and penicillin is the long acting antibiotic used for preventive purpose in cases of rheumatic heart disease which was the most prevalent predisposing factor for IE in this study. One of the common etiological agents of IE in a farmer population is *Coxiella burnetii*. All of patients of this study were from farmer population and serology for this organism was not done. This was the limitation of our study. This may be one of the causes of the recovery of low number of positive blood culture report. Predominant isolates and antibiotic susceptibility pattern were consistent with the finding by Pandit in 1999 in TUTH, Nepal and by Tibrewala in 1998 in Bir Hospital, Nepal. Prosthetic valve endocarditis was found in 2 cases only of which prosthetic valve as predisposing factor. No one was found as IV drug abuser. Continuous monitoring the blood culture system and antibiotic susceptibility test using standard protocol is required. The present study helps to give little bit concept in small number of patients and need to evaluate about various laboratory tests to identify cases of IE including large number of sample size in further study. We propose to take it up in the near future.

Conclusion

Blood culture and Echocardiography are very important tools for diagnosis and treatment of patients of IE. Continuous monitoring of antibiotic susceptibility test for

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isolates from blood culture is urgent to find out resistant isolates.

Bacteraemia and Septicaemia Cases Among Patients Visiting Bir Hospital, Nepal. [Dissertation], Kathmandu, Nepal, 1999.

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