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ANALYSIS OF MICROBIOLOGICAL AND CLINICAL PROFILE OF INFECTIVE ENDOCARDITIS PATIENTS

Dr Nawal Yousuf[1], Dr. Muhammad Hasnain Aslam[2], Dr Khalida Begum[2]

[1]Ibne Sina Hospital, Multan

[2]Nishtar Hospital, Multan

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Abstract:

Background and objective: *Infective endocarditis (IE) is an infection of the cardiac valves or mural endocardium caused by bacteria and fungi producing a wide variety of systemic signs. The basic aim of the study is to find and analyze the Microbiological and clinical profile of infective endocarditis patients of local population of Pakistan.* ***Methodology of the study:*** *This descriptive study was conducted at Nishtar Hospital Multan during March 2019 to November 2019. This was a prospective cohort study performed at the Clinical Laboratory (microbiology section) and cardiothoracic surgery of the hospitals. We identified suspected IE patients from samples submitted at the clinical lab: all blood and relevant tissue samples (cardiac vegetation, cardiac valves, valvular abscess etc.) that were received with history suggestive of endocarditis were enrolled and verbal consent obtained for it.* ***Results****During the study period, 100 patients with clinical diagnosis of IE were prospectively enrolled (table 01). Mean age of patients was 34.84 years with 72.1% being males. Adult representation was 84.6% and 15.4% were below 16 years. Using the MoDC 65.4% (*n *= 50) were identified as "definite cases of infective endocarditis" rest fell in the "possible case".* ***Conclusion:*** *It is concluded that Infective endocarditis remains a constant source of menace in medical practice, with associated morbidity and mortality.*

Corresponding author:

Dr. Nawal Yousuf,

Ibne Sina Hospital, Multan

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INTRODUCTION:

Infective endocarditis (IE) is an infection of the cardiac valves or mural endocardium caused by bacteria and fungi producing a wide variety of systemic signs and symptoms through several mechanisms, including both sterile and infected emboli and various immunological phenomena. The modified Dukes' diagnostic criteria have been in use for case definition as definite or possible IE. Infective Endocarditis (IE) is associated with significant disease burden, globally[1]. In 2010, IE was associated with 1.58 million disability-adjusted life-years or years of healthy life lost as a result of death and nonfatal illness or impairment. In past few decades the epidemiology, microbiologic profile and treatment outcomes of patients with IE in developed countries have changed significantly[2]. Rheumatic heart disease (RHD) which was once considered the main risk factor for IE is now being superseded by other factors such as invasive vascular interventions (IVI), prosthetic cardiac devices, implants and correction procedures for congenital cardiac defects[3].

IE studies conducted in Pakistan mainly retrospectively designed; have highlighted younger population being affected more frequently than those reported in the western world. As regards etiologic agents, most published studies have limitations in terms of poor sensitivity of bacterial culture methods utilized, such as conventional in-house blood culture methods. As a result up to 50% of IE cases are reported as culture negative[4]. Lack of authentic data of the common etiologic agents and their susceptibility pattern seriously hampers the choice of empirical antibiotic treatment. Moreover, there is a complete dearth of information that correlates use of vascular / cardiac procedure and implants with IE, disease severity and treatment outcomes in Pakistan[5].

IE patients with cardiac interventions / prosthetic valves have worse outcomes or complicated disease course compared to patients with native valves. A study in Cleveland compared long term post-surgery survival amongst patient with endocarditis having native valve endocarditis (NVE) and prosthetic valve disease (PVE) and reported improved survival in patients with NVE[6]. This may possibly be due to increased disease severity in patients with PVE. Brenan et al. in their study at 605 centers within the Society of Thoracic Surgeons Adult Cardiac Surgery Database showed an elevated 12-year risk of reoperation and endocarditis amongst bio prosthesis patients[7].

Objectives of the study

The basic aim of the study is to find and analyze the Microbiological and clinical profile of infective endocarditis patients of local population of Pakistan.

METHODOLOGY OF THE STUDY:

This descriptive study was conducted at Nishtar Hospital Multan during March 2019 to November 2019. This was a prospective cohort study performed at the Clinical Laboratory (microbiology section) and cardiothoracic surgery of the hospitals. We identified suspected IE patients from samples submitted at the clinical lab: all blood and relevant tissue samples (cardiac vegetation, cardiac valves, valvular abscess etc.) that were received with history suggestive of endocarditis were enrolled and verbal consent obtained for it. We followed blood / tissue culture to determine the microbiological and antimicrobial susceptibility profile of all recruited patients. The study was exempted from ethical approval by the research ethics committee of hospitals.

Inclusion Criteria

All suspected patients admitted under the service of internal medicine and cardio thoracic surgery fulfilling the modified Duke's criteria (MoDC) for IE were considered eligible and were enrolled.

Exclusion Criteria

Eligible patients who could not be contacted for history were excluded. Any samples with damaged blood culture bottles or tissue in unsterile container were rejected and not included in the study. Details of patient's clinical and microbiological profile were collected prospectively and entered in the predefined data collection form.

Statistical analysis

The data of respiratory function were compared between the smoker and non-smoker groups using the independent t-test for normally distributed data or the Mann-Whitney U test for other distributions. Differences were considered statistically significant at $p<0.05$.

RESULTS:

During the study period, 100 patients with clinical diagnosis of IE were prospectively enrolled (table 01). Mean age of patients was 34.84 years with 72.1% being males. Adult representation was 84.6% and 15.4% were below 16 years. Using the MoDC 65.4% ($n = 50$) were identified as "definite cases of infective endocarditis" rest fell in the "possible case". Cultures were sent on all 104 enrolled patients. Approximately 35% ($n = 36$) of patients were admitted at AKUH and were followed up for clinical outcomes. Blood culture samples for laboratory diagnosis only, were received for 82.7% of the enrolled cases. Of these, 47.6% cases had 3 sets, while 14.6% had 2 sets of blood culture samples.

Table 1: Microbiological profile and antibiotic resistance pattern of isolates from patient with infective endocarditis received at the AKUH clinical laboratory ($n = 100$)

Microorganism	**Total number cases $n = 100$(%)**	**Percent resistance of antibiotic for the species**									
		CN	**CI**	**ER**	**PE**	**VA**	**CH**	**OX**	**CP**	**AM**	**CR**
Gram positive organism	**68 (65.4)**										
Staphylococcus species	**24 (23.1)**										
•*S. aureus*	18 (17.3)	27.0	22.2	50.0	100	00	00	77.	44.4	–	–
MSSA	4 (3.8)										
MRSA	14 (13.5)										
•CONS	6 (5.8)	16.6	16.6	33.3	100	00	00	83.3	60.0	–	–
Streptococcus species	**36 (34.7)**	NP	20.0	40.0	14.2	00	–	–	–	–	02.8
•*S. pneumoniae*	2 (1.9)										
•*S. mitis*	8 (7.7)										
•*S. oralis*	5 (4.8)										
•*S. sanguis*	3 (2.9)										
•*S. viridans*	3 (2.9)										
•*S. milleri*	1 (1.0)										
•*S. bovis*	3 (2.9)										
•*Streptococcus species*	5 (4.8)										
•*Granulicatella adiacens*	1 (1.0)										
•*Aerococcus viridans*	2 (1.9)										
•*Gemella haemolysan*	1 (1.0)										
Enterococcus species	**4 (3.8)**	–	50.0	50.0	00	25.0	–	50.0	–		
*Corynebateriums*species	**4 (3.8)**	00	00	–	00	25.0	00		–		
Gram negative organism	3 (2.9)	–	–	–	–	–	33.3	–	00		
Fungus	3 (2.9)	No resistance to azoles and Amphotericin									
Candida albicans, Aspergillus niger, Fusarium species											
Culture negative cases	30 (28.8)	–									

DISCUSSION:

IE remains to be an uncommon disease with sporadic incidence, yet a serious entity in modern medicine, as its diagnosis requires a high degree of suspicion and treatment involves a holistic approach. Although there has been a notion that the incidence of IE has increased in recent years, contemporary population-based data have been lacking to support this opinion[8]. Guidelines from most professional societies, such as American Society for Microbiology (ASM) and Infectious Disease Society of America (IDSA), recommend that adult patient with suspected IE must be investigated by drawing at least 3 blood culture sets with appropriate volume. In our study population only 47.3% of total patients recruited had 3 sets of blood culture. Inaccessibility to health facilities, increasing diagnostic cost and lack of awareness are factors that often contribute to poor compliance to these essential pre-analytical components of blood culture analysis in Pakistan. We found *Streptococcus* group of bacteria to be the most frequently isolated organisms from blood and tissue cultures in both groups[9]. These findings are similar to those published by other groups nationally and from neighboring countries like China, India as well as internationally. Although *Streptococci* seem to predominate in developing regions, most western and developed parts of the world report *S. aureus* as the predominant causative agent of IE[10].

CONCLUSION:

It is concluded that Infective endocarditis remains a constant source of menace in medical practice, with associated morbidity and mortality. HRG can encounter a more complicated clinical course

requiring further surgical interventions, readmissions or death as opposed to native valve endocarditis patients therefore we recommend close follow up of high risk population.

REFERENCES:

1. S. Senthilkumar, T. Menon, and G. Subramanian, "Epidemiology of infective endocarditis in Chennai, South India," Indian Journal of Medical Sciences, vol. 64, no. 4, pp. 187–191, 2010.
2. F. K. Gould, D. W. Denning, T. S. J. Elliott et al., "Guidelines for the diagnosis and antibiotic treatment of endocarditis in adults: a report of the working party of the british society for antimicrobial chemotherapy," Journal of Antimicrobial Chemotherapy, vol. 67, no. 2, pp. 269–289, 2012.
3. D. T. Durack, A. S. Lukes, D. K. Bright et al., "New criteria for diagnosis of infective endocarditis: utilization of specific echocardiographic findings," The American Journal of Medicine, vol. 96, no. 2, pp. 200–209, 1994.
4. I. Weinberger, Z. Rotenberg, D. Zacharovitch, J. Fuchs, E. Davidson, and J. Agmon, "Native valve infective endocarditis in the 1970s versus the 1980s: underlying cardiac lesions and infecting organisms," Clinical Cardiology, vol. 13, no. 2, pp. 94–98, 1990.
5. I. T. Raju, R. Solanki, A. N. Patnaik, R. C. Barik, N. R. Kumari, and A. S. Gulati, "Brucella endocarditis—a series of five case reports," Indian Heart Journal, vol. 65, no. 1, pp. 72–77, 2013.
6. D. H. Bor, S. Woolhandler, R. Nardin, J. Brusch, and D. U. Himmelstein, "Infective endocarditis in the U.S., 1998–2009: A nationwide study," PLoS ONE, vol. 8, no. 3, Article ID e60033, 2013.
7. I. Gotsman, A. Meirovitz, N. Meizlish, M. Gotsman, C. Lotan, and D. Gilon, "Clinical and echocardiographic predictors of morbidity and mortality in infective endocarditis: the significance of vegetation size," Israel Medical Association Journal, vol. 9, no. 5, pp. 365–369, 2007.
8. Y. Takayama, R. Okamoto, and K. Sunakawa, "Definite infective endocarditis: clinical and microbiological features of 155 episodes in one Japanese University Hospital," Journal of the Formosan Medical Association, vol. 109, no. 11, pp. 788–799, 2010.
9. A. Mügge, W. G. Daniel, G. Frank, and P. R. Lichtlen, "Echocardiography in infective endocarditis: reassessment of prognostic implications of vegetation size determined by the transthoracic and the transesophageal approach," Journal of the American College of Cardiology, vol. 14, no. 3, pp. 631–638, 1989.
10. S.-M. Yuan, "Right-sided infective endocarditis: recent epidemiologic changes," International Journal of Clinical and Experimental Medicine, vol. 7, no. 1, pp. 199–218, 2014.