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How to Perform Effective Prophylaxis of Endocarditis in Developing Countries?

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ABSTRACT

Infective endocarditis is a preventable infectious heart disease that invades to endocardial part of heart. The occurrence of IE is still seen and has impacted to high risk morbidity patients. Despite it can easily be prevented, it is still been a challenge to prevent especially in low economic and developing countries. Antibiotic prophylaxis alone is not recommended to prevent infective endocarditis because there is no strong association between having an interventional procedures and development of IE. Preventive antibiotics are no longer recommended for any other congenital heart disease but may be considered in high-risk cardiac conditions. According to recent NICE and ESC guideline, prevention IE with antibiotic is needed to give clear information about the benefits and risks of antibiotics prophylaxis. Thus, it is very important to know how to give effective antibiotics prophylaxis in high risk patients.

Keywords: Infectious diseases, Endocarditis, Cardiovascular diseases, Prophylaxis

INTRODUCTION

Heart Infections, even though uncommon compared to other organs infection, endocarditis and rheumatic heart disease are usually seen as common infection of heart. Infective Endocarditis (IE) that basically affects the inner membrane of the heart (endocardium). Although patients with infective endocarditis in both children and adult can be seen around the world, risk of cardiovascular morbidity and mortality are significantly high in developing countries [1]. It is associated with older patients with co-morbidities and no known structural heart disease while the trend of IE has also evolved to affect young patients with pre-existing structural heart disease [2].

Because of the high risk of mortality seen in patients who live in developing nations, it is essential to provide effective treatment of endocarditis in developing countries. This article discusses about the effective management and prophylaxis of IE.

PREVALENCE OF INFECTIVE ENDOCARDITIS IN MID AFRICA AND SOME DEVELOPING COUNTRIES

Early in the 2014, I worked with Medicines Sans Frontier (Holland) in some developing nations including South East Asia countries in Myanmar; prevention of infectious diseases has been challenging matter in those areas. According to the Global Burden Disease 2013 Study of sixteen poorest countries [1], Infective endocarditis has impacted to the rate of DALY (disability-adjusted life-year) per 100000 in these regions was 60.0% in % of cardiovascular diseases DALYs was 1.7% [3]. Those static data shows it has been still a challenging issue to prevent and compact infective endocarditis sin these countries.

The Prevalence of IE is high in South Africa and other developing countries, is predominantly a disease of young patients with rheumatic heart. Although the microbiological features of infective endocarditis in Africa are similar to

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[1] Sixteen poorest countries [Niger, Ethiopia, South Sudan, Chad, Burkina Faso, Somalia, Sierra Leone (Guinea-Bissau, Guinea, Mali, Burundi, Central African Republic, Democratic Republic of the Congo, Mozambique, Liberia and Uganda)]

those of economically wealthier nations of the world. About 50% of IE in developing countries occurs in patients with no known history of valve disease. There is limited data mentioned the trend of particulars bacteria and pattern of IE incident in ASEANs and Southeast countries but Mirabel et al. [4] reported rheumatic heart disease remains a major predisposing factor of IE in Pacific tropical islands.

PREVENTION AND EFFECTIVE IE PROPHYLAXIS IN DEVELOPING COUNTRIES

As my experienced working with MSFs (Holland) in developing nation, in Myanmar, the MSFs has adopted South Africa National Guideline and some of the clinical management are revised for specific nations to make more suitable in recourse limited settings. South Africa Heart is an affiliated member of the European Society of Cardiology (ESC) and hence adopts the practice guidelines of the ESC [5]. The ESC Guideline states that antibiotic prophylaxis should be limited to those with the highest risk of IE. Both European Society of cardiology and ACC/AHA guideline still recommended the IE prevention with antibiotics for prosthetic valve or material used for repair, previous IE and Congenital heart disease (IIa/B, C) but 2015 ESC new guideline has no longer recommended for cardiac transplant with valvulopathy. In addition, both ESC and ACC/AHA recommend IE prophylaxis for Dental Procedure (Class IIb, LOE C). Patients with a prosthetic valve or prosthetic material used for cardiac repair have a higher risk of IE, greater mortality and develop more complications than those with native valve and an identical pathogen; this recommendation also applies to transcatheter-implanted prostheses.

As being a former physician of Medicines Sans Frontiers, had to care HIV patients. What I had noticed in that was despite HIV infection is not directly associated with an increased risk of IE, Infective Endocarditis with valvular heart diseases especially involvement of tricuspid valve lesion was seen in HIV infected in Africa and South East Asia where intravenous drug users are commonly seen. Koegelenberg et al. [6] stated that the main risk factors included RHD, in addition to prosthetic valves, CHD and a previous history of IE in their South African prospective observational study that examined the risk factors for IE but only 1 of their cohort of 92 patients was HIV seropositive [7]. Though antibiotic prophylaxis is not recommended, it is therefore indicated only in those with high-risk cardiac lesion.

The prevention of endocarditis in patients with RHD in Africa and South America are needed since RHD would promote as cardiac conditions associated with the highest risk of adverse outcome from endocarditis and has not improved over decades. The Infective Endocarditis Prophylaxis Expert Group has recommended that indigenous Australian and Pacific Oceana's patients with RHD are a special population at high risk for IE that should receive antibiotic prophylaxis [8] RHD is the major cause of valvular heart disease in Latin America countries where the oral health of the general population is extremely poor. The Brazilian Society of Cardiology and the Inter-American Society of Cardiology therefore recommends prophylaxis to all with valvular or CHD (that represents a risk for IE), before dental interventional procedures [9]. There are also no recommendations issued by local professional organizations in India, Pakistan, Myanmar, Bangladesh and Sri Lanka and hence the decision is left to the clinical judgment of the individual physician/dentist by revised the NICE and ESC Guideline.

BENEFITS AND RISKS OF ANTIBIOTIC PROPHYLAXIS

IE prophylaxis has been thought to get benefit by killing the pathogen in the bloodstream before it can affect to the heart valve. It is also traditionally thought to prevent adherence of bacteria to the thrombus forming on the valve and to eradicate the causal organisms that adhere to the thrombus. Although there is strong evidence that the risks and low cost-effectiveness of antibiotic prophylaxis might outweigh the benefits, widespread use of antibiotic prophylaxis might contribute to antibiotic resistance. Moreover, it is an important thing that the adjustment of risk and benefit of prophylaxis depend on patient's conditions especially in developing countries where are probably higher prevalence of drug resistance than developed nations. Thornhill et al. [10] showed that adverse event from the use of antibiotic prophylaxis with single dose amoxicillin resulted only two adverse events per year and no deaths and prophylaxis by clindamycin resulted in twice as many adverse events and one death every three years. Nevertheless, the level of evidence of antibiotic prophylaxis efficiency is usually depend on underlying high risk conditions of Infective endocarditis and the indications of its prescription have been revised in recent international guidelines.

ESC 2015 RECOMMENDATION

Cardiac conditions at highest risk of IE for which prophylaxis is recommended when a high-risk procedure is performed

Patients with previous IE have a greater risk for new IE, higher mortality and develop more complications than patients with a first episode of IE.

Patients with congenital heart disease (CHD):

- Any type of cyanotic CHD.
- Any type of CHD repaired with prosthetic material, whether placed surgically or by percutaneous technique, up to 6 months after the procedure or lifelong if residual shunt or valvular regurgitation remains.

High-risk is defined as those with underlying cardiac conditions associated with the greatest risk of adverse

outcome from IE and not necessarily those with an increased lifetime risk of endocarditis. For more details, refer to read and learn 2015 ESC Guidelines for the management of infective endocarditis

Recommendations for prophylaxis of IE in the highest risk patients, according to the type of dental procedure

According to the revised South Africa guideline, antibiotic prophylaxis is not recommended for local anesthetic injections in non-infected tissue, treatment of superficial carries, removal of sutures, dental X-rays, placement of removable prosthodontics or orthodontic appliances or braces or following shedding of deciduous teeth or trauma to the lips or oral mucosa. Antiseptic mouth rinses (chlorhexidine or povidone-iodine) may reduce the incidence or magnitude of bacteremia occurring.

SUGGESTIONS FOR THE FUTURE

There are many ongoing trails and analysis about antibiotic prophylaxis in the field of infectious medicine including infective endocarditis to improve effective treatment with reducing the occurrence of antibiotic resistance. Although preventive antibiotic for infective endocarditis on indicated patients use significantly lowers the risk for infection in patient, it is still challenging to follow the outcome of effectiveness in case series from single-center analysis. There would be good idea to analyses the effective infection control by Good oral hygiene, including daily flossing as an important preventative measure for all patients.

The threatened of antibiotic resistance by widespread use of antibiotics for this purpose, an important issue today, as well as needlessly expose patients to antibiotic side effects such as allergic reactions. For this reason, International Collaboration of Endocarditis (ICE) has been hopefully formed and large randomized clinical trials can be done by collecting various cohort data from multicenter internationally.

CONCLUSION

According to real world data analysis, there is no different strategy and special guidelines of IE prophylaxis in both developed and developing countries. There has been still challenging due to the low incidence of diseases and small retrospective analysis or case series to revise the IE prophylaxis for particular region. Generally, the most common pathogenic organisms in many developing countries setting are oral streptococci and the antibiotic choice should therefore be no different to that of the international guidelines. Overall, according to recent ESC guideline, NICE guideline and other consensus guidelines, prevention IE with antibiotic is needed to give clear information about the benefits and risks of antibiotic prophylaxis.

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