

Dentistry as a cause of Endocarditis in Baghdad governorate

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Abstract

Endocarditis is a localized microbial infection of the heart valves or endocardium adjacent to congenital or acquired heart defects. It is the dentist's responsibility to prevent the occurrence of endocarditis by following the latest recommendations usually issued by the American Heart Association on prevention of endocarditis. The purpose of this investigation was to determine the role of Dentistry in causing endocarditis among Iraqi at risk patients. A retrospective study of patient's records in three major hospitals in Baghdad was done. Thirty three cases of bacterial endocarditis were found and examined. The results indicated that (18%) of cases were preceded by dental procedures. Compliance with the guidelines on prevention of endocarditis is necessary for all at risk patients.

Key Word: Endocarditis, AHA guides lines, Prophylactic antibiotics, and dentist's compliance.

Introduction

Endocarditis is a localized microbial infection of the heart valves or endocardium near congenital or acquired heart defects ⁽¹⁾, in persons with rheumatic heart disease, congenital heart disease, or heart prosthesis, bacteria that enter the blood stream may lodge on damaged heart valves or other parts of endocardium and cause bacterial endocarditis. The disease is sometime described as occurring in a sub acute form in which the causative microorganisms are of low virulence namely *Streptococcus Viridans*. The acute form of endocarditis is caused by a highly virulent bacteria *Staphylococcus aureus* ⁽²⁾. In spite of all advances in the antimicrobial therapy and cardiac surgery, there are still high morbidity and mortality rates. The three diagnostic features of endocarditis are

fever, heart murmurs and positive blood cultures, in addition to anemia, splenomegally and embolic phenomena. Echocardiography usually reveals vegetations that develop on damaged valves; they consist of bacteria, fibrin and platelets. These vegetations are usually friable and may result in emboli that lodge in small blood vessels of kidneys, brain, eyes, skin and other tissues ^(3,4).

Bacteria normally live on parts of the body such as the skin, mouth, upper respiratory tract, and the intestinal and genitourinary tracts. Some dental and surgical procedures cause a brief entrance of bacteria into the blood stream. Endocarditis occurs in persons with pre-existing heart conditions ⁽⁵⁾. Prophylactic antibiotics are recommended prior to all dental procedures that are likely to induce bleeding. They provide protection

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against development of endocarditis as a result of bacteremia produced by dental procedures. The present practice involves the identification of risk patient by good medical history, and the use of antibiotic prophylaxis according to the recommendations usually issued by the American Heart Association (AHA). During the last five or six decades AHA has issued eight sets of recommendations.

The first appeared in 1955, supervised by its committee on prevention of rheumatic fever. The second set appeared in 1960, then 1965, 1972, 1977, 1984, 1990, and 1997^(7,8,9). Progressive changes and improvements have always been done according to advances in antibiotics, and clinical observations reported by different hospitals and medical centers concerning application of different sets of recommendations^(10, 11). It has been mentioned in the literature that a considerable number of patients with bacterial endocarditis have been seen shortly after having a dental treatment with or without antibiotic cover. This period have been determined to be between two days and two weeks^(12, 13).

The purpose of this investigation was to determine the role of dentistry in causing endocarditis among Iraqi at risk patients.

Materials and Methods:

Medical Records of cardiology departments in three major hospitals in Baghdad city were searched for cases of Bacterial Endocarditis. These hospitals are Kathmia teaching hospital, Medical city hospital and Ibnil Beetar center for cardiac surgery. Each record was examined by the researcher and the following information were recorded: Patients

age, gender, pre-existing disease, length of stay in the hospital, initial signs and symptoms, history of preceding dental treatment with or without antibiotic prophylaxis, laboratory investigations including blood cultures and causative microorganisms, echocardiography, and prognosis of the disease.

Results:

In Kathmia Teaching hospital there were around 10,000 admissions during the year 2004 in the department of Medicine. Around 2000 admissions were recorded as different cardiac disease. Only 6(0.3%) cases were admitted to the hospital as having endocarditis. This percentage is comparable to numbers reported elsewhere in the world. Only one case occurred 2 weeks following a dental extraction, while in the other five cases there was no reference to the cause of endocarditis, or any previous surgical procedure.

In Medical city hospital there were 24,000 admissions during the year 2004, including around 6,000 admissions in cardiology department, the records revealed 22 cases of endocarditis. In 3 cases there was a history of dental extraction or dental surgery 1 day to 2 weeks before the patient feels ill. In 8 cases there was history of tonsillectomy and appendicectomy different periods before endocarditis most of them longer than few weeks. Again no history of antibiotic prophylaxis before dental procedures. Two deaths were recorded.

In Ibnil Beetar hospital for cardiac surgery, because of absence of a central record source, a random sample of one hundred records was examined looking for endocarditis. Only five cases of endocarditis were found, two of them indicated a history of dental extraction one day and one week

before the beginning of infection. One of these two cases had antibiotic prophylaxis prescribed by the dentist. From the above mentioned five cases one death was recorded, in which the patient had prosthetic heart valve. For the 33 cases of endocarditis that found, the number of deaths in these hospitals were three, that means the mortality rate of endocarditis in Iraq according to this study is 9%. Number of male patients were 29 (88%) while the number of female patients were only four (12%), that means the male to female ratio is 7:1. More details are shown in Tables (1, 2 and 3).

Age range was between 11 years and 60 years with an average of 35 years. The length of stay in the hospital ranged between 1 week to 8 weeks. The causative microorganism in all 33 cases was bacterial, one caused by brucellosis. ESR was raised in all 33 cases. Fever, heart murmurs and positive blood cultures were present in all cases. Echocardiography was positive in all cases showing vegetations, valve dilatation and heart enlargement. In one of the six cases preceded by dental extraction antibiotic prophylaxis was given (Ampicilline capsules 500mg six hourly).

Table 1: Distribution of patients in the 3 Hospitals

Patient Distribution	Medical City Hospital	Kathmia Hospital	IbnilBeetar Hospital*
Total Admissions	24.000	10.000	100
Cardiovascular Admissions	6.000	2.000	100
Endocarditis Cases	22(0.37%)	6(0.3%)	5(5%)

*A random sample of 100 records was used

Table 2: relationship between endocarditis and pre-existing heart valve defect

Finding	No-of cases	Percentage
Congenital Heart disease	22	67%
Rheumatic Heart disease	9	27%
Heart prosthesis	2	6%

Table 3: prognosis, dental cause and gender ratio

No-of death	3	9%
Dental cause	6	18%
No-of Males	29	88%
No- of Females	4	12%

Discussion:

Once it is established that a patient has a heart valve defect his dental status must be thoroughly checked and all areas that provide foci of infection should be eliminated. All dental procedures that are likely to cause bleeding need antibiotic cover and that includes orthodontic bands placement, intra ligament anesthesia, and post insertion ulceration of complete dentures. All dentists should be familiar with the latest recommendations for prevention of endocarditis. It happened that the American Heart Association (AHA) took the lead in this respect and almost all the world follows its guidelines. The use of antibacterial mouth rinse such as chlorhexidine prior to dental procedures, and irrigation of gingival sulcus prior to extraction of teeth lowers the possibility of pushing bacteria into the blood stream, hence reduce the frequency and magnitude of bacteremia. It is advisable that dentists try to perform as much dental treatment as possible in each time antibiotic prophylaxis is given, then wait 10 days before the second session of antibiotic cover and dental treatment, to allow time for sensitive oral flora to be re-established, however, the development of resistant form of micro-organisms must be considered. If it happens that the patient forgets to take the prophylactic antibiotic and the dentist discovers that after completion of the dental procedure the AHA recommends that antibiotic administered soon after that. The results of this study indicated that the Frequency of congenital heart disease in Iraq as pre-existing heart valve disease is high (70%) and that of prosthetic heart valve is low (3%) when compared to similar situation in other countries. Dental procedures as a cause of endocarditis (18%) are higher than that in developed countries such

as the United States. There was one case in this study in which antibiotic prophylaxis was used but did not prevent the occurrence of endocarditis, this can be explained by either the development of bacterial resistance due to long period of hospitalization (1-8 weeks) , improper use of antibiotic by the patient or inaccurately prescribed by the dentist. The higher percentage of bacterial endocarditis in Ibnil Beetar hospital (5%) as compared to other hospitals (0.3%), could be explained by the fact that this hospital is well known to the public as being specialized in Cardiac surgery, and receives more medical referrals from other hospitals and clinics all over Iraq. The old saying, prevention is better than cure is perfectly applicable to the problem of bacterial endocarditis in dentistry.

Conclusions:

Endocarditis represents a real medical problem in Iraq which needs special attention from dentists in general and the Iraqi dental association in particular. The frequency of endocarditis in Iraq is higher than the developed countries. There should be a real concentration on medical history when dealing with any dental patient. We suggest that the Iraqi dental association takes the responsibility to distribute the latest recommendations for prevention of endocarditis to all Iraqi dentists to encourage compliance with these recommendations and hence reducing the occurrence of endocarditis due to the dental procedures.

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