ORIGINAL ARTICLE

FREQUENCY OF CARDIAC CONDITIONS IN PATIENTS SEEKING DENTO-MAXILLOFACIAL TREATMENT

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ABSTRACT

Patients living with cardiovascular disease are susceptible to physical and emotional stress. This is further magnified if the patient needs dental treatment, as dental surgery itself is stress provoking. Cardiac patient may collapse and die in the dental chair, because of cardiogenic emergencies and multiple drug interactions. The objective of the study was to determine the frequency of cardiac conditions in patients seeking Dento-maxillofacial treatment at two Hospitals of Peshawar. Cardiac patients are a great risk for dental surgeons, that is why a multidisciplinary approach while managing these medically compromised dental patients is of paramount importance to achieve the desired outcome. The present study was carried out on 66 patients with cardiac illness reporting to oral and maxillofacial surgical unit of Rahman College of Dentistry and Khyber College of Dentistry, Peshawar. The age range was from 31 to 61 years, a mean age of 57.076 years SD ± 14.552. The most common cardiac condition was ischemic heart disease i.e. twenty-eight (42.42%) followed by patients with coronary artery bypass grafting (24.2%) special care is required in dental management of these cardiac compromised patients.

Key Words: *Cardiovascular disease, ischemic heart disease, dental management, valvular heart disease, infective endocarditis, congenital heart disease.*

INTRODUCTION

Cardiovascular diseases have always been a major cause of morbidity and mortality in both the developed and under-developed world. Ischemic heart diseases (IHD), cerebrovascular disease (CVD), are the two conditions that cause most deaths, with heart failure at the third place. Patients with cardiovascular disease include risk cases in dental and oral surgical practice, particularly in the absence of ample medical control. It is therefore, fundamental for oral surgeons to be familiar with the medical co-morbid condition of each individual patient, the treatments received, and the alternate treatment options. The oral surgeon must be competent enough to recognize the medical/ cardiac emergencies encountered in dental office. In addition, they should have knowledge about the preventive and treatment strategies required for these patients.[1]

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Chest pain (angina) occurs when there is partial blockage of coronary vessels supplying the heart tissues and there is no myocardial necrosis. On the other hand, Acute MI ensues when the blockage is total and there is necrosis. As a result sudden death may also occur, generally because of arrhythmias. In IHD, there is partial or complete occlusion of the coronary blood flow.[2]

Valvular heart disease is the result of one or more pathological processes, including congenital heart defects, ischemic heart disease, rheumatic fever, connective tissue disease (e.g. systemic lupus erythematosus, SLE), marfans syndrome. The most important rationale of dental surgery in patients with vulvular heart disease is the need to avoid infective endocarditis EI. Dental procedures are associated with transient bactremia lasting for 15 to 32 minutes, but the bacteria may lodge on damaged heart valves, thus resulting into endocarditis. The percentage of these patients reported in literature ranges from three to 40%.[3]

Poor Oral health has a negative impact on the outcome of the cardiac surgery, since there is always a fear of infective endocarditic. Consequently, the cardiac / cardiothoracic surgeons must refer surgical patients to general dentists or oral and maxillofacial

surgeons for antibiotic prophylaxis and treatment of dental / oral infections before embarking upon the cardiac surgery to prevent infective endocarditis.[4] Hence a Multi-disciplinary team approach is required to prevent complications and better prognosis.[5]

The objective of the present study was to determine the frequency of cardiac conditions in patients seeking Dento-maxillofacial treatment at two hospitals of Peshawar. This study emphasizes the importance of development of protocols followed by oral and maxillofacial surgeons, while treating these complex cardiac compromised patients in dental set up.

METHODOLOGY

A descriptive, cross sectional study was conducted in Department of Oral and Maxillofacial Surgery, at Rehman College of Dentistry and Khyber College of Dentistry, Peshawar, over a period of nine months after taking the approval from hospitals ethical and research committee. The study was carried out on a total of sixty-six cardiac patients coming through the out-patient department having dental complaints i.e. oral surgical complaints. The data was collected regarding the variables of the study i.e. age, gender, type of cardiac problem/ disease. A detailed history was taken and data regarding associated cardiac co- morbidities like ischemic heart diease, vulvular heart disease, prosthetic heart valves, electic devices like, that pace makers, septal defects and syndromic patients was collected. This was followed by physical examination. Complete intraoral and extra oral examination was done. The culprit tooth and associated symptoms were identified. Patients requiring treatment under local anesthesia and general anesthesia both were included in the study. Treatment was provided after consultation with patient's cardiac physician/ surgeon. Special protocols were followed in treating these patients after physician's consultation.

RESULTS

A total of sixty-six cardiac patients presenting with dental problems reporting to the Department of Oral and Maxillofacial Surgery of two centers i.e. Rahman College of Dentistry and Khyber College of Dentistry, were included in the study. Among these 39 (59%) were males and 27 (40%) were females with male to female ratio of 1.4:1 (Fig 1). The age range was from 1 to 61 years with a mean age of 57.076 years SD ± 14.552 (Table 2). The most common cardiac condition was ischemic heart disease twenty-eight (42.42%) followed by patients with CABG (24.2%), prosthetic heart valves (13.63%) syndromic patients (4.54%), septal heart defects (10.6%) and (4.54%) of cardiac pace makers (Table 3). The most common age group in these patient was 6th decade followed by 5th decade. (Table 2)

DISCUSSION

Cardiac patients seeking dental treatment are a source of constant stress for the dental/ oral and maxillofacial surgeons, as these patients are prone to cardiac emergencies in the dental chair and post operative bleeding due to medications, like blood thinners. Opinion of the cardiologist/ general physician while treating medically compromised patients is very important for the patient safety and dentists to avoid unnecessary

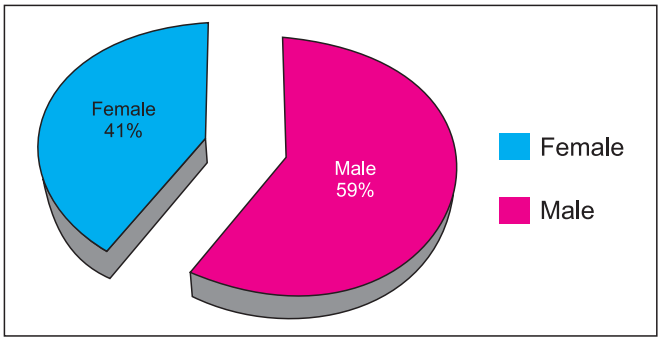

Fig 1: Percentage of male and female patients with cardiac diseases

TABLE 1: ANTIBIOTIC REGIMEN FOR PROPHYLAXIS OF BACTERIAL ENDOCARDITIS

Situation	Agent	Regimen: 30-60 Min before procedure Adults	Regimen: 30-60 Min before procedure Children
Oral	Amoxicillin	2gms	50mg/kg
Parenteral	Ampicillin	2gm IM or IV	50MG/kg IM or IV
	Cefazolin/ ceftriaxone	1 gm IM or IV	50mg/kg IM or IV
Penicillin allergy, Oral	Cephalexin	2 gm	50 mg/kg
	Clindamycin	600mg	20mg/kg
	Azithromycin/clarithromycin	500mg	15mg/kg
Penicillin allergy, Parenteral	Cefazolin /ceftriaxone	1 gm IM or IV	50 mg/kg IM or IV
	Clindamycin	600 mg IM or IV	20 mg /kg IM or IV

TABLE 2: AGE DISTRIBUTION IN PATIENTS WITH CARDIAC DISEASES

Age group of patients	No. of patients	Percentage
1-10 years	3	4.54%
31- 40 years	5	7.57%
41- 50 years	5	7.57%
51- 60 years	15	22.7%
61- 70 years	38	57.57%
Total	66	100%

TABLE 3: CARDIAC CONDITIONS PRESENTING IN PATIENTS

S. No.	Cardiac conditions	No. of patients	Per-centage
1	Ischemiac heart disease	28	42.42%
2	Coronary artery bypass grafting	16	24.2%
3	Prosthetic heart valves	9	13.63%
4	Syndromic patients with cardiac anamolies	3	4.54%
5	Septal defects	7	10.6%
6	Cardiac pacemakers	3	4.54%
Total		66	100%

medico-legal litigations. A liaison between the patient cardiologist/ physician and the dental practitioner will reduce the incidence of emergencies during the immediate vital postoperative period after complex cardiac surgeries as well as decrease the incidence of sub acute bacterial endocarditic.[4]

Primary objective of the management of these patients is that during dental surgery/treatment one need to ensure that the hemodynamic change resulted because of the dental/surgical procedure does not; increase the cardiovascular reserves of the patients. This is best accomplished by minimizing any hemodynamic alterations during treatment (that is, by maintaining the patient's optimum blood pressure, heart rate, heart rhythm, cardiac output and myocardial oxygen demand).[6,7]

The purpose of the present study was to evaluate the frequency of cardiac problems in patients seeking dental treatment in two dental hospitals of Peshawar, Khyber Pakhtunkhwa, Pakistan. The most common cardiac co-morbid condition reported was ischemic heart disease (IHD), followed by coronary artery bypass grafting (CABG) i.e., 42.42% and 24.2% respectively. The study supports in this regard the study conducted by Lakhani JM[8] on over all co morbid patients seeking dental extractions, IHD was the third overall co-morbid condition reported after hypertension and diabetes in Karachi.

Hypertension is defined as a systolic blood pressure of more than 140mm Hg or diastolic blood pressure exceeding more than 90mm Hg. These patients are at increased risk of Angina Pectoris, MI, Stroke and heart failure. All these Medical/ cardiac emergencies can occur during and after dental treatment[9,10] MI and angina which are the manifestations of the IHD are the most common causes of death in USA.[11,12] It is caused by a disparity between the demand and supply of oxygen to the heart tissue. Adopting measures to decrease dental anxiety during treatment is vital for IHD prone patients. Patients with a history of MI in the previous six months should be differed for elective dental care because of their propensity to repeat infarcts and cardiovascular complications. This is because the peak mortality in these patients is within the first year of MI[13], because of increased electrical instability of the myocardium after infarctions.[14] Dental treatments under these circumstances should be aimed at alleviation of the dental pain.[15] Patients with angina in emergency settings should not be sedated, as this disturbs their ability to report angina pain. During long appointments with dentists, they should monitor the BP and pulse rate of the patients.[16] Availability of Nitrate tablets, while treating those on nirates is important during dental appointments and for management of acute angina attack. Anti coagulants / blood, thinners can be associated with increased incidence of operative and postoperative bleeding in dental surgical procedures. Nevertheless, stopping these important drugs without consultation of health care physician may sometimes lead to thrmbo-embolic adverse events. Hence, it is important not to discontinue these medications, while doing minor oral surgery.[17,18]

International Normalized Ratio (INR), on the day of surgery, should be determined, minor oral surgical procedure can be carried out with INR value of less than 4, with additional local hemostatic measures.[15] According to the present study Majority of the cardiac patients seeking oral surgical care were aged above 50 years i.e., 80%. The study is consistent in this regard with the study of Marta Cruz[1], Stating that in both genders ischemic heart disease is the main cause of death in patients above age 40 and 65 years means cardiac problems are common in advanced age groups.

Electric devices (Cardiac pacemaker, implantable cardioverter defibrillator) used for the treatment of

dysrythmias emit electric signals. These devices are sensitive to electromagnetic signals which are produced by dental equipments i.e., electric pulp tester, surgical unit, scalers etc. Therefore, caution should be exercised while treating these patients. Although the newer advanced model devices, (Bipolar devices with electromagnetic shielding are not affected by the small electromagnetic fields produced by the dental equipments. Great care must be exercised while, operating upon a monopolar cautry, ultrasonic scalers and cleansing systems, composite curing lights near individuals having pace makers and implantable cardioverter defibrillators.[19] In the Present study 4.54% of the patients had cardiac pace makers. Patients with deformed heart valves needs special attention and consultation with the cardiologist regarding antibiotic prophylaxis.[20]

In the present study 13.63% with prosthetic heart valves and 4.54% of patients with congenital heart disease, reported to the two centers. Patients with prosthetic heart valves, with history of IE, congenital heart disease and cardiac transplant recipients developing valvolopathy are special risk patients for developing IE.[21] The antibiotic regimen for IE in the risk group patients receiving dental treatment as per American Heart Association Guidelines is given in Table 1.

The new guidelines stress on to maintain best oral health to reduce the risk of IE than taking preventive antibiotics before dental surgical procedures.[22]

Approximately 20% of congenital heart defects are associated with syndromes and other extracardiac malformations. Syndromes associated with congenital heart disease are Trisomy[21], Di-Georges syndrome, Williams syndrome, Turner syndrome, Marfan syndrome, nonaan syndrome.[23,24] In the present study 4.54% of patients were syndromic. In patients with CHD, anticoagulation and antiplatelet therapy may be necessary to prevent thromboembolic states. Those on chronic anticoagulation therapy may require adjustment before undergoing oral surgery. According to Sacco et al. (2006), stopping or reducing the anticoagulation therapy before oral surgery is not necessary if simple measures for local hemostasis are implemented (haemostatic gauze, sponges and sutures, and Tranexamic acid).[25] The use of immunosuppressive drugs (e.g., cyclosporine) is essential for heart transplant patients to avoid the possibility of rejection.[26] Therefore, the use of antibiotic prophylaxis becomes mandatory in patients requiring dental treatment with congenital heart disease to avoid bacteremia. Preventive antibiotics prior to a dental procedure are advised for patients as given in Table 1. Avoidance of dental disease in patients susceptible to endocarditis should be given more attention. A closer collaboration between all medical professionals is needed. Our syndromic patients were also treated in close liaison with patients treating physician/cardiac surgeon.

General anesthesia may be considered when children with CHD require multiple dental procedures to limit the number of visits, thereby minimizing stress and the need for repeated courses of antibiotics if necessary. If general anesthesia is indicated, the treatment should be completed in a hospital environment, where adequate supportive care is available if needed and where the patient can receive a more in-depth medical evaluation.[27] In some children with complex cardiac defects, sedation has to be performed in cooperation with the child's cardiologist.[28]

CONCLUSION AND RECOMMENDATIONS

Ischemic heart disease and coronary artery bypass grafting are the most frequent cardiac compromised conditions in patients seeking dental/oral surgical treatment at the two centers of Peshawar.

Multidisciplinary approach, while treating these medically compromised high-risk patients is important to reduce life-threatening complications. Elective treatment should be avoided in patients with recent MI (6 Months). Emergency treatment needs to be carried out with consultation of the cardiologist.

Coronary artery bypass grafts (CABG) patients, should defer elective dental treatment in the first six months, if required they can undergo emergency dental surgery, under prophylactic antibiotic cover in the first six months.

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2 Muslim Khan: Idea about research, introduction, tabulation, recommendations.