The frequency of patients with cardiovascular and endocrine diseases in a dental faculty

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Summary

Objectives: The general health of the dental patient is important in dental practice as it can influence dental management of the patients. The purpose of this study was to assess the incidence of cardiovascular and endocrine diseases in patients who referred for dental treatment.
Study Design: A total 13527 records of patients who were examined in our clinic were reviewed retrospectively to investigate the incidence of cardiovascular and endocrine diseases.
Results: According to the findings of the present study, the prevalence of hypertension was found as 12.8%, cardiac disease as 6.4%, diabetes as 2.9%, thyroid disease as 5.3 %.
Conclusions: This survey showed that dental patients may have serious systemic diseases that dental practitioner must pay attention to. A detailed medical consultation must be taken to reveal these diseases. The dentist can prevent many medical emergencies by taking appropriate precautions during dental treatment.

Key words: cardiovascular diseases, endocrine diseases, dental patients.

Introduction

The general health of the dental patient is important in dental practice as it can influence the dental management of the patients. Due to recent advances in Medicine, patients have a longer life expectancy and many diseases can be controlled with a maintenance programme. This means that some patients may have to take long-term medication, which tends to make illness chronic. Patients who have serious chronic or past medical problems may need dental treatment [1]. Previous studies showed that cardiovascular disease is the most common medical problem in dental patients [1-6]. Therefore, dentists need to clearly know the medical problems of the patients before treatment so as to prevent unexpected abnormal systemic reactions and exacerbations of systemic diseases [5]. A thorough medical history is basic to understanding a patient's overall health [7]. Therefore, taking a careful medical history before undertaking any dental procedure is mandatory in order to provide appropriate care for these patients [2]. It is particularly important to identify complications of cardiovascular and endocrine diseases in patients who will undergo dental procedures.

In Turkey, no study has been undertaken so far concerning the frequency of cardiovascular and endocrine diseases in dental patients. Therefore the purpose of this study was to assess the incidence of these disorders in a group of patients referred for dental treatment. To accomplish this, patient records were reviewed retrospectively to investigate the incidence of these diseases in our dental faculty.

Methods

A total of 13527 records of patients who were examined between October 1, 2002 and October 1, 2004 were reviewed retrospectively. The study group consisted of adult patients, ages varying between 16 and 105 years, who were referred to our Oral Diagnostic Clinic for an oral examination and a dental treatment plan. The medical histories of patients were taken before routine clinical and radiographic examination. In cases of poor histories, additional information was obtained from the subjects' family members. There were 24 main questions and each contained one or more further specific questions. The answers to the questions related with cardiovascular and endocrine diseases were evaluated for the present study. While the questions about hypertension, arrhythmias, bypass surgery, cardiac insufficiency, angioplasty, rheumatic fever, myocardial infarction, mitral valve prolapsus, angina, pacemaker, congenital heart disease and aneurysm, comprised the cardiovascular part, the questions about thyroid and diabetes formed the endocrine part. If a patient was currently under the management of a physician (that is, receiving medicines and regular examinations) on the day of the first examination at our department, or if the patient had previously been diagnosed as having organic or functional disorders caused by past diseases, the patient's answer was recorded as "yes". A dental software program was used for the collection of data. The chi-square test was utilized to evaluate correlations between different parameters.

Results

Out of 13527 patients who participated in the study, 5260 were males (39%) and 8267 were females (61%). The average age of the patients was 44.35 years (ranges from 16 to 105 years) with a standard deviation of 17.36 years. The patients in the study group were divided into eight age ranges: 16-20 years (7.7%), 21-30 years (18%), 31-40 (19.5%), 41-50 (18.9%), 51-60 (17%), 61-70 (9.9%), 71-80 (7.1%) and >81 (1.9%).

Among the reasons for attendance to the dental faculty, the major problems were pain (11.9%, n = 1613), prosthetic rehabilitation (9.4%, n = 1273), dental caries (5.5%, n = 749), periodontal diseases (7.2 %, n = 974) and a combination of two or more (59%, n = 7979).

Table 1 shows the medical conditions of the patients. According to the findings of the present study, the prevalence of hypertension was 12.8% (n = 1725). A statistically significant correlation was found between age and hypertension ($p < 0.0001$). In other words, hypertension was more frequently observed in older patients. In females, the prevalence of hypertension was 66% (n = 1141) and in males it was 34% (n = 584).

Table 1: Medical conditions of the dental patients

Medical conditions	Percentage % (n)
Hypertension	12.8 (1725)
Cardiac Diseases	6.4 (866)
Thyroid	5.3 (721)
Goiter	4.2 (574)
Hypothyroid	1 (129)
Hyperthyroid	0.1 (18)
Diabetes	2.9 (393)
Type I diabetes	0.1 (14)
Type II diabetes	2.8 (379)

Hypertension was found to be significantly more common in females than males ($p < 0.0001$). Within the group of patients with hypertension, the usage of antihypertensive drugs was 82% (n = 1419). The remaining 17.8% (n = 306), did not take any medication against hypertension. The frequency of patients with hypotension was 1.6 % (n = 222).

In the present study, the incidence of patients with any form of cardiac disease was found as 6.4% (n = 866) and classified as follows: 21% (n = 184) suffered from arrhythmias, 12.4% (n = 108) had undergone angioplasty, 12% (n = 106) had undergone bypass, 12% (n = 105) had cardiac insufficiency, 11% (n = 96) had mitral valve stenosis due to rheumatic fever, 9% (n = 80) had a history of myocardial infarction, 5.7% (n = 50) mitral valve prolapsus, 1.6% (n = 14) had angina, 1.5% (n = 13) had a pacemaker, 0.9% (n = 8) had congenital heart disease and finally only two patients had aneurysm.

No statistically significant correlation was determined between gender and cardiac diseases, ($p > 0.05$). Cardiac diseases were more frequently observed in older patients, ($p < 0.0001$). Within the patients with cardiac diseases, the percentages of smokers and non-smokers were found to be 6.5% and 6.4% respectively. No significant correlation was determined between smoking and the occurrence of cardiac diseases ($p > 0.05$). 0.2 % of the patients who had undergone bypass surgery were smokers and 0.9 % were non-smokers. Interestingly, among patients who have undergone bypass surgery, the incidence of non-smokers was significantly higher ($p < 0.0001$).

Within the cardiac patients, 43% referred to the clinic for both periodontal and prosthetic management (n = 375), whereas 19% of the patients came for restorative procedures ($p < 0.0001$).

The prevalence of the patients with diabetes was found to be 2.9% (n = 393); type I (insulin dependent) 0.1 % (n = 14) and type II (non-insulin dependent) 2.8% (n = 379). Among the type II diabetics, the major reasons presenting to the clinic were both prosthetic and periodontal treatments with an incidence of 47% (n = 177). The prevalence of attending for prosthetic and restorative reasons was found as 17% and 23%, respectively ($p < 0.0001$).

The questions referring to the thyroid disease revealed that 5.3 % (n = 721) of the patients had a thyroid disorder. Within this group, 4.2 % (n = 574) had goiter, 1% (n = 129) hypothyroidism, and 0.1 % (n = 18) hyperthyroidism. Hypothyroidism was observed more frequently in females with a percentage of 1.4 (n = 114) and the result was statistically significant ($p < 0.0001$).

Discussion

It is known that there is a great prevalence of patients who suffer from some type of systemic disease, which is taken to account when dental treatment is required. All patients, who attended our clinic for dental examination during a period of two years, were evaluated. The sample population was sufficient to be representative of the type of patients who attend a dental practice. Due to the fact that no similar study had been undertaken in our country concerning this subject, a comparison could only be made with researches carried out abroad. The mean age of our study population was 44 years old. Other studies show that the prevalence of medical problems increase with advancing age [1, 7-10].

Previous studies show that hypertension is the most common cardiovascular disease, occurring most commonly in elderly patients [1,3,5]. The findings of the present study support this observation, as it shows that the most common cardiovascular disease is hypertension with 12.8 per cent of patients, older patients being more hypertensive. The results of a study of hyperten-

sive patients showed that in Turkey, hypertension affects 36% of males and 49% of females [11]. In the present study, hypertension was determined in 34% of males and 66% of females. The result is in accordance with the results of the aforementioned research, which also show a female predominance in terms of hypertension. Dentists must be careful, as in patients with hypertension, abnormal elevation of blood pressure, hypertensive crisis, cerebral bleeding are possibly caused by dental stress or by epinephrine in local anesthetics [12-16]. Orthostatic hypotension, xerostomia, gingival overgrowth, lichenoid reactions are the complications of hypertension that dentists must have knowledge about [17].

According to the results of the present study, the second most frequent cardiac-related disease was arrhythmia (21%). Little et al. [18] proved there was a 17.2% prevalence of cardiac arrhythmia in numerous populations of patients (>10.000). Furfberg et al. [19] have found the prevalence in the United States to be approximately 10%. Cardiac arrhythmias may be found in healthy individuals, in patients taking various medications, and in patients with certain cardiovascular conditions or with other systemic diseases [4, 20-22]. The dentist can prevent many cardiac arrhythmia-related emergencies by taking appropriate precautions during dental treatment. Dentists must reduce patient's anxiety, avoid excessive amounts of epinephrine and minimize stressful situations during dental management [4].

In the present study, 9% of the cardiac patients had a history of myocardial infarction and 12% had bypass surgery. Jainkittivong et al. [3] found the prevalence of myocardial infarction and heart surgery as 4.7%. Chandler [1] reported that the percentage for myocardial infarction and cardiac insufficiency was 1.8%. Cardiac insufficiency is one of the main causes of death in the United States [23]. In Turkey, myocardial infarction rate was estimated as 27% [24]. According to the findings of the present study, 12% of the patients suffer from cardiac insufficiency. In Turkey, cardiovascular diseases lead to death with an incidence of 43% [25]. Dentists must be careful that both the injection of local anesthetic with vasoconstrictor and regular dental treatments could indeed be risky within 3 months after coronary artery bypass surgery [26]. Patients with cardiac diseases may be receiving anticoagulant therapy, and therefore the dentist should consult with the patient's physician before performing surgical procedures [4].

Within the patients with cardiac diseases, the usage of pacemakers was found as 1.5 %. Chandler [1] found this percentage as 0.1. The type of pacemaker should be identified and its susceptibility to electromagnetic interference determined [4]. Miller et al. [27] discovered that the only devices causing significant electromagnetic interference with pacemakers in the dental office were electrosurgery units, vitalometry, ultrasonic bath cleaners, ultrasonic scaling devices.

Previous studies showed that there is correlation with periodontal disease, dental caries and cardiovascular diseases [6, 28-31]. In the present study, among the cardiac patients, the major reasons for attendance to the dental faculty were found as prosthetic and periodontal treatment (43%) and restorative treatment (19%). Periodontal disease is one of the reasons for tooth loss in elderly subjects [32]. This is an expected finding since these patients would need a prosthetic treatment as well.

Different studies showed that 2-4% of the patients were diabetics [1,33,34]. Diabetes mellitus is a chronic metabolic disorder affecting at least 7.2 % of the population in Turkey [35]. The present research showed that 2.9% of the patients were diabetic; 0.1% type I and 2.8 % type II. It is known that type I occurs in 10% of diabetic patients. Type II diabetes mellitus is com-

mon in older persons and more frequent (90%) than type I [36, 37].

Our recent study shows that a significant difference in the number of missing teeth was found between adult patients with type I-II diabetes mellitus and non-diabetic patients. Among the type II diabetics the major reasons for attending the clinic were both the necessity of a new prosthesis and periodontal problems (47%). The prevalence of attending for prosthesis and dental caries was found as 17% and 23% respectively. It was reported that periodontal disease was the most prevalent oral complication in patients with poorly controlled diabetes mellitus [38].

According to the findings of this study, it is estimated that 5.3% of the patient population had some kind of thyroid dysfunction. Goiter (4.2%) was the most frequently observed thyroid disease. The second one was hypothyroidism (1%). Hyperthyroidism (0.1%) was 10 times less frequent than hypothyroidism. In a recent study, 0.8% of the total population suffered from hypothyroidism. In the United States, hypothyroidism is 5-6 times more frequent than hyperthyroidism [1]. Jainkittivong et al. [3] found that 4% of the dental patients had thyroid dysfunction. Among the patients with hypothyroidism, a female predominance (1.4%) was found in the present study. Previous studies showed the disease was more frequent in females [1,39]. These findings are in accordance with the present study. Due to the fact that a subclinical cardiac disease is often associated with hyperthyroidism, dentists must be extremely cautious with these patients. Local anesthetic must be used without vasoconstrictor [37,40,41]. For the patient with hypothyroidism, the usage of narcotic analgesics and drugs for dental sedation may cause respiratory and cardiovascular depression and collapse [37].

This survey showed that dental patients might have serious systemic diseases that the dental practitioner must pay attention to. A detailed medical consultation must be taken to reveal these diseases. Discussion with physicians should be a routine activity for dentists and may prevent medical emergencies. It must always be kept in mind that precautions taken prior to the treatment of a medically compromised patient may prevent medical emergencies significantly.

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