ORIGINAL ARTICLE

CONTENTS

Prevalence of comorbidities systemic diseases (CSD) in patients requesting dental care in teaching dental clinic/ Al Muthanna University/ Iraq

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ABSTRACT

Aim: To determine the prevalence of CSD and its relationship to gender, age, and number of missing teeth among patients.

Materials and Methods: Medical history of 526 patients requested dental care were analyzed.

Results: There were 168 (31.939%) with one or more CSD, including 66 (39.28%) and 102 (60.71%) for male and female, respectively. The age group of patients was 67(39.88%), 88(52.38%) and 13(7.73%) for age groups 20-40, 41-60, and >60 years, respectively. The distribution of CSD were 87 (51.78%), 63(37.5%), and 18 (10.71%) for single, double, and multiple, respectively. The percentages of blood hypertension (BH), diabetes Mellitus (DM), others, and cardiovascular diseases (CVD) were 94 (55.95%), 58 (34.52%), 54 (32.14%), and 40 (23.80%) respectively, The 1-4 missing teeth occurred in 127 (75. 59%) of patients, including 47 (27.97%) and 80 (47.61%) for males and females, respectively, with significant differences (P-value=0.027).

Conclusions: A high prevalence of CSD was reported among patients seeking dental care. BH, DM, OD, and CVD were the commonly reported CSD, with variations in their percentages involving BH at the top of the list. Understanding the association between systemic diseases and oral health will greatly assist dental healthcare providers in treating patients in the dental department safely and effectively.

KEY WORDS: Dental treatment, Systemic diseases, Teeth extraction

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INTRODUCTION

The quality of life depends on the number of teeth. Nonetheless, more missing teeth could be associated with a relatively inferior quality of life [1]. Some apparently normal individuals request oral treatment but experience serious CSD, and their therapeutic drugs negatively influence dental treatment [2]. Likewise, dentists need comprehensive medical experience in providing dental services to the crowding population of patients. Previous studies reported that numerous patients presented for routine dental treatments may have underlying complex medical conditions unaware of [3]. Diabetes mellitus, systemic hypertension, gastrointestinal condition like peptic ulcer disease, and chronic renal failure are at the top of the systemic problems increasingly reported in dental clinics [4-5]. According to previous studies, a high percentage of the prevalence of hypertension, diabetes mellitus, peptic ulcer, and chronic renal failure was reported at 73% [6], 10 % [7], 34% [8], and 26% [9], respectively. On the other hand, in developing countries, many patients are unaware of their illness because these conditions do not reveal acute pain. Further, these patients do not seek medical care accompanied by poor access to health care. Understanding the medical problems associated with the development and pathogenesis of the dental problem will help find the necessary dental treatment modifications to achieve the wanted outcomes [10]. Oral health is crucial to systemic health, and medical conditions enormously impact oral health. Furthermore, a previous study determined a positive relationship between surgical site infection and oral lesions [11]. Researchers determined the changing of oral structures due to plaque bacteria associated with many medical conditions [12].

Concomitant oral disorders such as xerostomia, mucositis (chemotherapy), gingivitis, oral ulcerations, and pigmentations may be associated with using or abusing medication to address these systemic problems [13]. The earlier study observed medical problems in more than half (51.2%) dental patients with female sex

Table 1. Shows gender distribution of patients with comorbid diseases

Gender	With comorbid	Without comorbid	Total
	N (%)	N (%)	N (%)
Male	66 (39.28%)	210 (58.6%)	276 (52.47%)
Female	102 (60.71%)	148 (41.34%)	250 (47.52%)
P value	0.000 Sig		
Total	168(31.93%)	358 (68%)	526 (100%)

Table 2. Shows the distribution of the total sample with comorbid by age

Comorbid	Age (Y)	N (%)
With comorbid	20-40	67(39.88%)
	41-60	88(52.38%)
	>60	13(7.73%)
Total		168(100%)

Table 3. Shows the distribution of comorbid diseases

Comorbid diseases	N (%)
Single	87(51.78%)
Double	63(37.5%)
Multiple	18(10.71%)
Total	168 (100%)

Table 4. Shows the distribution of the patients according to the type of comorbid diseases

Groups	N (%)
Blood hypertension	94 (55.95%)
diabetes mellitus	58 (34.52%)
Other diseases	54 (32.14%)
cardiovascular diseases	40 (23.80%)

predilection [14]. Oral lesions and systemic conditions showed a bidirectional relationship according to prior studies [15]. This means that managing oral problems could relieve the underlying systemic problems, and conversely, managing systemic problems may improve oral problems. Researchers perceived improvement in blood sugar levels, stroke, chronic kidney disease, with treatment of periodontal problems [16-17]. There are many dental complications result from undiagnosed or poorly managed comorbidities and medical conditions. Therefore, a preliminary diagnosis should be done for systemic problems for the patients presented for the first time to oral care dentist to make appropriate referrals. A literature review regarding the prevalence of CSD in patients requesting dental treatment in the Al Muthanna governorate revealed scarce publications. Consequently, this study intends to determine the distribution of comorbidities systemic diseases among patients attending the teaching dental clinic at Al Muthanna University/ Iraq.

AIM

To determine the prevalence of CSD and its relationship to gender, age, and number of missing teeth among patients.

MATERIALS AND METHODS

From October (2021) to May (2022), a review of 526 patient reports who requested oral and dental management was done. Patients' data, including age, gender, and number of missing teeth, were recorded according to WHO oral health survey basic methods guideline [18]. The number of teeth was taken as 28, excluding the third molars. History of systemic diseases (cardiovascular, diabetes mellitus, gastrointestinal, rheumatological, blood hypertension, liver and kidney disease, and others) were reported. The patients' ages were categorized into 20–40, 41–60, and 61 years and above.

INCLUSION CRITERIA

All patients' reports attending teaching dental clinic / surgery department / College of Dentistry/ AL Muthanna University, suffering from dental complaints during the year of the study, were included in this study.

EXCLUSION CRITERIA

Patients with ages less than 18 years and patients with incomplete reports were excluded from this study.

STUDY LIMITATIONS

The critical limitations were incomplete reviews, missing data, and inadequate patient reporting. Additionally, COVID-19 limited dental treatment at the time of the study preparation.

ETHICAL CONSIDERATIONS

Ethical principles were taken into consideration during the study. Names and medical history information remained confidential. This study was approved by the Research and Ethical Committee / College of Dentistry/ AL Muthaana University. All patients signed a consent form and agreement to be included in this study.

Table 5. Shows the number of missing teeth accompanied patients with comorbid diseases

Patients N&%		Number of Missing Teeth			P-value
		M =0	M (1-4)	M (5-10)	
Male	No&%	19 (11.30%)	47 (27.97%)	0.0%	0.027 Sig
Female		22 (13.09%)	80 (47.61%)	0.0%	
Total		41 (24.40%)	127 (75. 59%)	0.0%	

STATISTICAL METHOD

Statistical Package SPSS 16.0 was used as a student's t-test. Test Fisher's exact for variables gender, presence or absence of comorbid and teeth number."p" value < 0.05 was considered significant statistically.

RESULTS

Five hundred twenty-six patients were involved in this study. According to gender, the numbers and percentages of males and females were 276 (52.47%) and 250 (47.1%), respectively. Out of 526 patients, 168 (31.939%) were reported having either one or more comorbid diseases, including 66 (39.28%) and 102 (60.71%) for males and females, respectively, with a highly significant (0.000) (Table 1). While the number of patients without comorbid disease was 358, comprising 210 (58.6%) and 148 (41.34%) for males and females, respectively.

Out of 168 patients, there were 67 (39.88%), 88 (52.38%) and 13(7.73%) for age groups 20-40, 41-60, and >60 years, respectively (Table 2).

Out of 168 patients with comorbid diseases or conditions, there were 87 (51.78%), 63(37.5%), and 18 (10.71%) for single, double, and multiple CSD, respectively (Table 3).

The distribution of comorbid diseases was 94 (55.95%), 58 (34.52%), 54 (32.14%), and 40 (23.80%) for blood hypertension, diabetes Mellitus, other diseases, and cardiovascular diseases (Table4).

Out of 168 patients with comorbid diseases, there were 41 (24.40%) revealed zero missing teeth, including 19 (11.30%) and 22 (13.09%) for males and females, respectively. Moreover, the total number of patients with 1-4 missing teeth was 127 (75. 59%), including 47 (27.97%) and 80 (47.61%) for males and females, respectively, with significant differences (P-value=0.027) (Table 5).

DISCUSSION

According to the statement of Seymour, (2007) "Good general health and quality of life are connected with good oral health". The mouth is considered part of the body [19] and is a link between dentistry and medicine. The individual general health and diseases are integrated to reflect the oral health status and well – being. A previous study approved a significantly increasing number of periapical lesions, tooth loss, poor quality root canal treatment, and periapical index in patients with previous medical history. Researchers approved the higher significant percentages of poor oral index in patients suffering from anemia, diabetes mellitus, hypertension, prostate disease, and other disabilities, for example, mental retardation and hearing impairment [4]. The past medical patient history is vital to recognize patients complaining of dental or medical problems to ensure safety with appropriate and accurate protective methods. Dental and oral treatment is commonly safe for clinicians and patients when working under the umbrella of high and extensive knowledge related to medical status [20]. The current study emphasizes CSD in the patients requesting dental care and their relationship to gender, age, and missing teeth. Five hundred twenty-six patients were included in this study, comprising 276 (52.47%) and 250 (47.1%) male and female, respectively. Furthermore, 168 patients were reported with single or multiple CSD. For those patients with CSD, there was a highly significant (0.000) relationship to their gender, with a higher percentage (60.71%) in females compared to (39.28%) in males.

These results are compatible with previously published research, showing that females presented the higher severity of depressive symptoms measured by the Patient Health Questionnaire-9 (4.0±4.1 vs. 2.8±3.8; p<0.001) [21, 22]. Moreover, the high percentage of females may be related to hormonal disturbances that surprisingly strongly affect general and oral health status. Hence, hormonal disturbances may also be reflected in oral and periodontal tissues [23]. Various hormones, such as estrogen, progesterone, and androgen receptors, also affect the periodontal structure. Progesterone causes direct and robust effects on periodontium and also has a significant role in bone coupling tissue formation and reabsorption [24] . Thus, tooth mobility is sometimes associated with hormonal disturbances [25]. In contrast, some studies reported no significant differences in mobility and missing teeth with a woman's hormonal changes milieu [26].

The present study showed an increase in the prevalence of CSD with aging. Most patients with CSD

88 (52.38%) were populated in the 41-60 years age group among patients suffering from certain medical complications, followed by the age group 20-40 year 67(39.88%). These results agree with other previous studies, which focused on the elderly systemic diseases and their implications on dental practice, such as cardiovascular diseases, diabetes mellitus, Alzheimer's disease and Parkinson's disease, osteoporosis, and oral cancer [27]. While other researchers reported the age distribution, and most patients were in the age group 41-50 years followed by 51-60 years [28]. These results are also compatible with observations reported by Chan *et al.* (2021) [29], who concluded a bidirectional relationship between oral and general health. Besides, they mentioned that rheumatoid arthritis, depression, Alzheimer's disease, Parkinson's disease, diabetes, hypertension, rheumatoid arthritis, and depression were the most prevalent diseases that occur with increasing of age, leading to raising the susceptibility of patients to oral diseases because of the side effects of medications [30].

The results of the current study reported high percentages of patients suffering from a single 87 (51.78%) and double 63(37.5%) CSD, compared with patients complaining the multiple diseases, whose occupied the least percentage 18 (10.71%). The results also showed variations in the distribution of these diseases, including 94 (55.95%), 58 (34.52%), 54 (32.14%), and 40 (23.80%) for blood hypertension, diabetes Mellitus, other diseases, and cardiovascular diseases. These results are compatible with a previously reported study in Saudi's Eastern Province [30]. They approved the positive relation between multiple CSD and severity of periodontal disease in relation to increased attachment loss, bone loss, and increased number of missing teeth [30].

Blood hypertension (BH) showed a higher percentage, 55.95%, among all reported CSD in the current study, because blood hypertension is one of the major systemic diseases reported in 1.28 billion adults aged 30-79 years worldwide [31]. Blood hypertension is a major risk susceptibility factor causing cardiovascular complications leading to death. A previous study approved that 1 out of 3 people over 45 years of age showed blood hypertension in Pakistan as recorded by a survey of Pakistan national health [32] .

Out of 168 patients with CSD, there were 41 (24.40%) revealed zero missing teeth, including 19 (11.30%) and 22 (13.09%) for males and females, respectively. At the same time, the number of patients with 1-4 missing teeth was 127 (75. 59%), including 47 (27.97%), and 80 (47.61%) for males and females, respectively, with significant differences (P-value=0.027). The mean values of missing teeth of patients suffering from blood hypertension were higher than other groups. These results may be explained the association between systemic diseases and oral health status, especially periodontitis, which shares common risk factors such as stress, increased age, and socioeconomic factors [33]. These observations are compatible with previous studies of another researcher, who approved the relationship between the number of missing teeth and the occurrence of chronic diseases, specifically myocardial infarction [34]. Furthermore, other previous findings approved the effects of antihypertensive therapy on the oral cavity, like mouth xerostomia, gingival tissue overgrowth, salivary gland swelling and pain, lichened drugs sensitivity, alteration in taste sense [33, 35-36].

The current study also reported 58 (34.52%) patients with diabetes mellitus as CSD after blood hypertension. Recently, there has been an escalation in the prevalence of diabetes mellitus, commonly type 2, threatening the population, life quality, and economy, accompanied by a high incidence of the disease and its complications [37]. Uncontrolled diabetic patients lead to high caries experiences, periodontal tissue complications, and delayed wound healing related to surgical treatment and teeth mobility [38-39]. Accurate guidelines must be followed to provide oral care during diabetic patient management. The general medical status of patients requires certain modifications during dental and oral treatments [40]. A high percentage of missing teeth was recorded in diabetic patients. These results are compatible with previous studies that mentioned the initiation and progression of periodontal tissue complications due to diabetes mellitus. Moreover, periodontal tissue damage also occurs from a metabolic disorder associated with diabetes Mellitus resulting from long-duration illness as a risk factor that occurs as an extensive and severe irritants factor in the mouth. Likewise, Rajhans et al., (2011) [41] found a significant correlation between glycemic level and teeth mobility, that reported in 43.7% of diabetic patients. However, other researchers reported a high prevalence of teeth mobility in type 2 Diabetes Mellitus compared to non-diabetic individuals [42]. They mentioned the reduction of bone tissue growth aspects with mineralization processing in the absence of insulin.

In conclusion, this study approved the relationship between the prevalence of CSD in patients requesting dental care. Blood hypertension, diabetes mellitus, other diseases, and cardiovascular system diseases were the commonly reported CSD with variations in their percentages of prevalence, and hypertension was at the top of the list. Understanding the associatioen between systemic diseases and oral health will greatly assist dental healthcare providers in treating dental department patients safely and effectively.

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CONFLICT OF INTEREST

The Authors declare no conflict of interest

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