

**PREVALENCE OF MEDICALLY COMPROMISED PATIENTS VISITING CLINICS OF  
COLLEGE OF DENTISTRY AT KING SAUD UNIVERSITY**

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**ABSTRACT**

**Background:** Knowledge of systemic conditions is essential for successful dental management therefore impaired health status of medically compromised patients works as alarm for dentist. **Objective:** To determine the prevalence of various medical conditions among patients visiting clinics of the College of Dentistry at King Saud University (KSU). **Materials and Methods:** A cross-sectional retrospective study, conducted in College of Dentistry at KSU, Riyadh. This study included inspection of files of all the patient seeking dental treatment in the clinics during 5 years period from June 2009 to June 2014. Files with incomplete personal and medical information or non-legible record were excluded from the study. Systemic sampling technique was used to review approximately (15436) files. The collected data were entered into SPSS Version 20. Descriptive statistics (frequencies, means and standard deviations) were generated. Proportional test between gender was used. P value less than 0.05 was considered as level of significant. **Results:** Data were obtained from 15436 patients' file (8125 completed files; 5284(65%) male; 2841(35%) female). About 1633 (20.1%) of the patients had at least one medical condition. The most common diseases were diabetes mellitus 422(5.2%), hypertension 343(4.2%), asthma 221(2.7%), anemia 122(1.5%), bleeding tendency 50(0.6%) and hypothyroidism 45(0.6%). There were statistically significant differences between male and female in hypertension disease (male 3.6%; female 5.4%, p=0.00); anemia disease (male 0.9%, female 2.6%, p=0.00); hematological disease (male 0.1%, female 0.3%, p=0.03); hepatitis (male 0.3%, female 0.1%, p=0.03); syphilis disease (male 0.2%, female 0.0%, p=0.03); hypothyroidism (male 0.0%, female 1.5%, p=0.00); other thyroid disease (male 0.0%, female 0.4%, p=0.00); penicillin allergy (male 0.3%, female 0.9%, p=0.00). **Conclusion:** Diabetes mellitus, hypertension, and asthma were most prevalent medical conditions among dental patients. Therefore, documenting the full medical history and clinical examinations are necessary before and after dental treatment.

**KEYWORDS:** Dental patients; medically compromised; dental clinics; diabetes mellitus; hypertension; asthma.

**INTRODUCTION**

Systemic disorders are "true abnormalities or diseases with signs and symptoms that deviate from normal and that define diseases such as diabetes mellitus".<sup>[1]</sup> Dorland's dictionary defines systemic disease as "one that affects a number of organs and tissues, or affects the body as a whole", which affects the lifestyle and daily activity of people.<sup>[2]</sup>

Most medically compromised patients require oral healthcare. The term "Medically Compromised refers to dental patients with impaired health status like pregnancy, or patients with systemic diseases like ischemic heart disease, congenital heart disease, liver disease, renal disease, asthma, patients with

immunodeficiency and patients with altered immune status".<sup>[3]</sup>

The impaired health status of medically compromised patients works as an alarm for dentists because this issue can lead to medical complications during dental treatment. Thus, dentists should have knowledge and skills to be able to diagnose and manage any medical emergencies in the clinic.<sup>[4]</sup>

Therefore, knowledge and skills about dental management of medically compromised individuals are very important for dental professionals, especially to provide high standard of dental healthcare.

Interrelationship between oral and general health involves most organ systems. For example, the medical–dental interaction relates to hematologic, autoimmune, and infectious diseases. Untreated dental problems in medically compromised patients (either children or adults) may aggravate their condition. A dental infection in a prosthetic valve patient can be a major medical risk.<sup>[5]</sup> Therefore, dentists have to properly plan for patients with medical diseases.<sup>[6]</sup>

Knowledge of systemic conditions is essential for successful dental management, which includes obtaining patient's complete medical history, current status, and coordination with patient's physician to avoid any unnecessary risk during dental treatment.<sup>[7, 8]</sup>

The ratio of medically compromised patient seen by dentists is expected to increase owing to medical advancements and better survival rates. Many studies have been conducted to determine the prevalence of medically compromised patients seen by dentists.

Cottone and Kafrawy (1979) have determined that 68.5% of dental patients had at least one significant medical disease.<sup>[9]</sup> Nery et al. have revealed that the private office group had 27.6% medical diseases, while the academic dental center group had 46.3%.<sup>[10]</sup> Rhodus et al. (1989) have reported that medical diseases in dental patients increased from 7.3% in 1976 to 24.6% in 1986.<sup>[11]</sup>

Saengsirinavin et al. have revealed that the prevalence of medical diseases in Thai dental patients is 55.4%.<sup>[12]</sup> Smeets et al. have determined that the prevalence of medically compromised patients in Netherlands is 28.2%.<sup>[7]</sup> In their recent study, Mesgarzadeh et al. have reported that 41% of their dental patients had at least one medical condition.<sup>[13]</sup>

There are variations among studies with regard to the most common disease among dental patients in Saudi Arabia. Previous studies have reported that hypertension, diabetes mellitus, and heart diseases as most common among dental patients.<sup>[8,13-15]</sup> According to the International Diabetes Federation (IDF) Diabetes Atlas, the prevalence of diabetes mellitus in Saudi Arabia is 18.3%<sup>[16]</sup> and that of hypertension is 15.2%.<sup>[17]</sup>

The aim of the current study was to determine the prevalence of various medical conditions among patients visiting clinics at the College of Dentistry at King Saud University.

## MATERIALS AND METHODS

The current study was a cross-sectional retrospective study that was conducted at the College of Dentistry at King Saud University, Riyadh. The College of Dentistry is the oldest dental college in Saudi Arabia; it was established in 1957. The college graduates approximately 100 students every year and accommodates approximately 600 male and female students at all levels.

This study included inspection of medical history section of patients' files seeking dental treatment in the clinics at the College of Dentistry during a 5-year period from June 2009 to June 2014. Files with incomplete personal and medical information or non-legible record were excluded from the study. Approval was obtained from the College of Dentistry Research Center (CDRC) prior to data collection (NF2379).

A systemic sampling technique was used to review approximately 15436 files (June 2009–June 2014) from the booking area of the Boy University Campus (BUC) and Girl University Campus (GUC).

The collected data were entered into computer using the Statistical Package for the Social Sciences (SPSS Version 20) software. Descriptive statistics (frequencies, means, and standard deviations) were generated. A proportional test between genders was used. The P value of less than 0.05 was considered to be significant.

## RESULTS

The total number of files was 77180. The data were obtained from the files of 15436 patients. There were 8125 completed files, of which 5284 (65%) were male and 2841 (35%) were female files. A total of 7311 files were incomplete owing to the lack of patient data such as unknown medical problem, nationality, or gender. The mean age of the patients was 27 years old.

Approximately 1633 (20.1%) patients had at least one medical condition, 292 (3.6%) had two medical conditions, and 71 (0.9%) had three or more medical conditions. The medical diseases were categorized as cardiovascular, hematologic, respiratory, gastrointestinal, genitourinary, endocrine, and neurologic diseases and allergic conditions. The most common diseases were diabetes mellitus 422 (5.2%), hypertension 343 (4.2%), asthma 221 (2.7%), anemia 122 (1.5%), bleeding tendency 50 (0.6%), and hypothyroidism 45 (0.6%).

In the cardiovascular disease category, hypertension (4.2%), cardiac problems (1.0%), and rheumatic fever (0.2%) were most common, as shown in Table 1. There were statistically significant differences between males (3.6%) and females (5.4%) in terms of hypertension disease ( $p = 0.00$ ).

In the hematologic disease category, anemia (1.5%), bleeding tendency (0.6%), and hematological disease (0.2%) were most common, as shown in Table 2. There were statistically significant differences between males (0.9%) and females (2.6%) in terms of anemia disease ( $p = 0.00$ ) and between males (0.1%) and females (0.3%) in terms of hematological disease ( $p = 0.03$ ).

In the respiratory disease category, asthma (2.7%) and tuberculosis (0.1%) were most common, as shown in Table 3.

In the gastrointestinal disease category, hepatitis B (0.3%), hepatitis C (0.1%), and peptic ulcer (0.1%) are most common, as shown in Table 4. There were statistically significant differences between males (0.3%) and females (0.1%) in terms of hepatitis ( $p = 0.03$ ).

In the genitourinary disease category, renal disease (0.3%) was most common, as shown in Table 5. There were statistically significant differences between males (0.2%) and females (0.0%) in terms of syphilis disease ( $p = 0.03$ ).

In the endocrine disease category, diabetes mellitus (5.2%) and hypothyroidism (0.6%) were most common, as shown in Table 6. There were statistically significant differences between males (0.0%) and females (1.5%) in terms of hypothyroidism ( $p = 0.00$ ) and between males

(0.0%) and females (0.4%) in terms of other thyroid diseases ( $p = 0.00$ ).

In the allergic conditions category, penicillin allergy (0.5%) and food allergy (0.3) were most common, as shown in Table 7. There were statistically significant differences between males (0.3%) and females (0.9%) in terms of penicillin allergy ( $p = 0.00$ ).

There were statistically significant differences between males (0.3%) and females (0.8%) in terms of arthritis ( $p = 0.01$ ).

Most medical diseases were more prevalent in male than in female patients except for hypertension, anemia, asthma, hepatitis C, peptic ulcer, and penicillin allergy, as shown in the tables.

**Table 1: Prevalence of cardiovascular disease among the dental patients.**

Medical diseases	Total n (%)	Male n (%)	Female n (%)	P-Value
Hypertension*	343(4.2)	189(3.6)	154(5.4)	0.00
Cardiac problem‡	79(1.0)	65(1.1)	23(0.8)	0.06
Rheumatic fever	20(0.2)	13(0.2)	7(0.2)	0.99
Hypotension	5(0.1)	1(0.0)	4(0.1)	0.09
Heart failure	4(0.0)	3(0.1)	1(0.0)	0.65
Heart valve transplant	3(0.0)	2(0.0)	1(0.0)	0.95
Previous myocardial infarction	2(0.0)	2(0.0)	0(0.0)	0.16

\*There is a statistically significant difference between male & female

‡ it is written according to the patient's record which was not specifying the disease

**Table 2: Prevalence of Hematologic diseases among the dental patients.**

Medical diseases	Total n (%)	Male n (%)	Female n (%)	P-Value
Anemia *	122(1.5)	49(0.9)	73(2.6)	0.00
Bleeding tendency	50(0.6)	35(0.7)	15(0.5)	0.44
Hematological disease*‡	13(0.2)	4(0.1)	9(0.3)	0.03
Sickle cell anemia	9(0.1)	8(0.2)	1(0.0)	0.07
Stroke	8(0.1)	2(0.0)	6(0.2)	0.06
Anticoagulant with coumarin	2(0.0)	0(0.0)	2(0.1)	0.16

\*There is a statistically significant difference between male & female

‡ it is written according to the patient's record which was not specifying the disease

**Table 3: Prevalence of Respiratory disease among the dental patients.**

Medical diseases	Total n (%)	Male n (%)	Female n (%)	P-Value
Asthma	221(2.7)	135(2.6)	86(3.0)	0.22
Tuberculosis	7(0.1)	4(0.1)	3(0.1)	0.68
Other respiratory disease*	4(0.0)	4(0.1)	0(0.0)	0.05
Chronic obstructive pulmonary disease	2(0.00)	1(0.0)	1(0.0)	0.68

\*Unspecified disease by patient

**Table 4: Prevalence of gastrointestinal disease in the dental patients.**

Medical diseases	Total n (%)	Male n (%)	Female n (%)	P-Value
Hepatitis B	22(0.3)	16(0.3)	6(0.2)	0.424
Hepatitis C	10(0.1)	5(0.1)	5(0.2)	0.36
Peptic ulcer	12(0.1)	7(0.1)	5(0.2)	0.64
Hepatitis*	20 (0.2)	17(0.3)	3(0.1)	0.03
Other liver diseases**	6(0.1)	4(0.1)	2(0.1)	0.93

\*There is a statistically significant difference between male & female

\*\*Unspecified disease by patient

**Table 5: Prevalence of Genitourinary disease in the dental patients.**

Medical diseases	Total n (%)	Male n (%)	Female n (%)	P-Value
Renal disease	25(0.3)	16(0.3)	9(0.3)	0.91
Gonorrhoea	12(0.1)	10(0.2)	2(0.1)	0.13
Syphilis*	11(0.1)	10(0.2)	1(0.0)	0.03

\*There is a statistically significant difference between male & female

**Table 6: Prevalence of Endocrine diseases in the dental patients.**

Medical diseases	Total n (%)	Male n (%)	Female n (%)	P-Value
Diabetes mellitus	422 (5.2)	275(5.2)	147(5.2)	0.95
Hypothyroidism*	45(0.6)	1(0.0)	44(1.5)	0.00
Hyperthyroidism	6(0.1)	2(0.0)	4(0.1)	0.17
Other Thyroid disease**	13(0.2)	2(0.0)	11(0.4)	0.00

\*There is a statistically significant difference between male & female

\*\*Unspecified disease by patient

**Table 7: Prevalence of allergic conditions in the dental patients.**

Medical diseases	Total n (%)	Male n (%)	Female n (%)	P-Value
Penicillin allergy*	42(0.5)	17(0.3)	25(0.9)	0.00
Food allergy	27(0.3)	17(0.3)	10(0.4)	0.82
Drug Allergy	21(0.3)	16(0.3)	5(0.2)	0.25
Aspirin allergy	3(0.0)	3(0.1)	0(0.0)	0.08

\*There is a statistically significant difference between male & female

## DISCUSSION

This study reviewed files of all patients who visited the clinics at the College of Dentistry at King Saud University to determine the prevalence of various medical conditions. Overall, this study highlights different medical conditions and shows that diabetes mellitus, hypertension, and asthma have higher prevalence. This study shows that most dental patients are healthy, which is approximately similar to the study by Almas et al.<sup>[15]</sup> In contrast, compared to this study, previous studies have demonstrated the lower prevalence of healthy patients.<sup>[8, 18-20]</sup>

This study shows the high prevalence of medical conditions compared to other studies<sup>[15, 21]</sup> but in the drawback of Almas study, it was conducted with periodontal cases with short period (6 months) and with more samples of female. Also low prevalence was found in the study of Bhateja<sup>[22]</sup> but it was conducted in a short period (1 year) without patient interview and physical examinations.

In contrast, this study showed the low prevalence of medical condition compared to other studies.<sup>[7, 9-12, 18]</sup> Nevertheless, some studies showed high prevalence but were conducted over short periods of time (3–6 months),<sup>[13, 19, 20]</sup> while other studies included a small sample and incomplete files.<sup>[8]</sup>

The findings of this study are consistent with those of a previous study, which showed that the most prevalent medical conditions among dental patients were hypertension and diabetes mellitus.<sup>[19, 21, 22]</sup> This study showed that the prevalence of diabetes mellitus was

similar to that in a previous study by Almas et al., Al Bayaty, and Mesgarzadeh.<sup>[13, 15, 18]</sup>

In contrast, Dhanuthai et al.<sup>[21]</sup> have determined that diabetes mellitus had low prevalence, while other studies have determined that diabetes mellitus had higher prevalence among dental patients compared with this study.<sup>[8, 19, 20, 22]</sup> This study showed that the prevalence of diabetes was lower than the prevalence in Saudi Arabia.<sup>[16]</sup>

The prevalence of hypertension in this study was similar to that in the previous study by Dhanuthai et al.,<sup>[21]</sup> higher than that in the study by Almas,<sup>[15]</sup> lower than that in other studies,<sup>[8, 13, 19, 20, 23]</sup> and also lower than the prevalence in Saudi Arabia.<sup>[17]</sup>

The prevalence of asthma in this study was higher than that in the study by Almas<sup>[15]</sup> and lower than that in previous studies.<sup>[8, 18]</sup> Compared to this study, other studies did not mention asthma but referred to the high prevalence of respiratory disorders in general.<sup>[22]</sup>

The prevalence of anemia in this study was lower than that in previous studies,<sup>[8, 20]</sup> which possibly occurred because this study was conducted in Riyadh city, which does not have many anemic patients.

The prevalence of bleeding in this study was low and was not in agreement with that in the previous study by ElAbdin.<sup>[8]</sup>

The prevalence of hypothyroidism in this study was low and was not in agreement with that in previous studies.<sup>[8,20]</sup>

The prevalence of hepatitis B in this study was low and was not in agreement with that in the previous study.<sup>[8]</sup> Other studies did not specify hepatitis B in their results but referred to liver disease, which possibly included more disease types other than hepatitis B.<sup>[20, 22]</sup>

The prevalence of renal disease in this study was low and was not in agreement with that in previous studies.<sup>[20, 22]</sup> The prevalence of penicillin allergy in this study was low and was not in agreement with that in previous studies.<sup>[18, 22]</sup> Other studies did not specify penicillin allergy in their results but referred to the high prevalence of drug allergy in general compared to this study, which may include penicillin allergy.<sup>[8, 20]</sup>

The local prevalence of diabetes mellitus and hypertension in Saudi Arabia, which was described in previous studies, indicated that few diabetic and hypertensive patients visited the dental clinic according to this study. This is possibly attributed to the low awareness about dental care. Thus, the management of systemic disease is a priority for these patients.

This study reviewed patients' files to collect data, while another study recommended to use the Questionnaire of European Medical Risk Related History (EMRRH), which is a valid and useful tool for detecting medically compromised patients.<sup>[24]</sup>

Teaching investigation and dental management of medically compromised patients (especially with diabetes mellitus, hypertension, and asthma) requires more emphasis in college curriculum to make students more competent and confident when dealing with such diseases and to provide a high quality of healthcare without complications.

Some limitations of this study needs to be considered when interpreting the results. Some files were missing or unclear. In addition, this study was conducted only at the College of Dentistry; this reflects the local conditions of dental patients, which limited the generalizability of the findings. Moreover, this is a retrospective study, which was conducted by reviewing patient files without interviews or physical examinations; thus, patients with undiagnosed medically compromised conditions may be undetected. In addition, sexually transmitted diseases (e.g., AIDS) may be denied by some patients; thus, such diseased were not included. Further research is needed to review patient files with clinical and laboratory examination to confirm medical diagnosis.

## CONCLUSION

Diabetes mellitus, hypertension, and asthma were the most prevalent medical conditions among dental patients. Therefore, it is essential to document the full medical history, and clinical examinations are necessary before and after the dental treatment. In addition, it is necessary to encourage the patients to provide clear and accurate

medical information to avoid hiding necessary medical conditions.

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