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Assessment of the medical status in a dental school patient population

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Objectives Systemic diseases can influence oral health and dental treatment plan. The taking of medical history is mandatory in order to provide proper care to the dental patients. The aims of this study were to assess the prevalence and characteristics of medical problems in a dental school patients and to investigate if medical problems were related to patients' age and gender.

Materials and methods Reviews of 4,315 dental records from Chulalongkorn University Dental School in 1993 were performed.

Results There were 18.7% of patients reported at least one medical problems. Adverse drug reactions (46.6%) and cardiovascular diseases (21.9%) were the major medical conditions found in this population studied. The remaining 31.5 % were distributed among infectious diseases, endocrine disorders and blood diseases. The frequency of medical problems increased significantly as age increased ($p = 0.001$). The highest frequency of medical problems (36.8%) was noted in the old and they tended to have multiple medical problems. There were no significant differences in the presence of medical problems between males and females. However adverse drug reactions were reported more often in females, but infectious diseases were reported more often in males.

Conclusions In this study age was a significant factor in the presence of medical problems. Our study also emphasized the necessity of taking medical history prior to dental treatment

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Key words : Medical problems, Cardiovascular diseases, Age-related factors

As the medical care technology is far advanced, more patients with chronic or life threatening diseases live longer. Additionally, the increasing number of older population gives rise to more individuals whose chronic diseases are common and consumption of medications are high. Dentists are more likely to encounter this enlarging medically compromised patient group. Therefore, dentist must be aware for the complication or danger to life that may happen in those patients during dental treatment. Pretreatment evaluation is important to the prevention of medical emergencies. A good medical history is basic to understanding each

patient's total health.¹ Information obtained from the medical history helps the dental practitioner to correlate the general health of the patient with the treatment of oral problems.² Thus the taking of a careful medical history before any dental procedures is mandatory in order to provide proper care to the patients. Medical history provides the information necessary to evaluate the overall health of the patients; to avoid emergency crises; to help the dentist in prescribing appropriate treatment for the patients and to minimize any legal risks that may occur during therapy; as well as to diagnose oral diseases.³

Furthermore, dentist should be able to identify those medical conditions that can influence the success of treatment. Several systemic conditions can influence oral health and dental treatment to some degree and, conversely dental treatment may also have an influence on some systemic conditions. The most common of those conditions are cardiovascular diseases, respiratory diseases, diabetes, bleeding tendency, allergies, and drug therapy. Anesthesia with vasoconstrictors, routinely used in dentistry, can place dental patients with medical problems at increased risk. Vasoconstrictors are contraindicated in patients with cardiovascular diseases and in patients with a history of hyperthyroidism, diabetes, allergies to sulfites, asthma, and pheochromocytoma.^{4,5} Antibiotic coverage is indicated for all dental procedures likely to induce temporary bacteremia in patients who are predisposed to infective endocarditis and in patients with prosthetic joints.⁶⁻⁸ Prophylactic antibiotic should also be prescribed in patients who are susceptible to infection and a significant delay in wound healing such as in diabetic, renal and liver disease patients, patients on chemotherapy, patients with blood dyscrasias, patients with abnormal adrenal function, and patients with autoimmune and collagen diseases.⁷⁻⁸ Some dental procedures are likely to cause bleeding, thus patients with anticoagulant therapy, blood diseases, and chronic liver diseases must be in particularly concerned.⁷ Patients with adrenal insufficiency or undergoing long-term corticosteroid therapy will respond poorly to stress and adrenal crises may result.⁹⁻¹¹ Steroid supplement should be administered in those patients before receiving any dental procedures of significant stress such as oral or periodontal surgery.^{9,11,12}

Surveys from different dental practice settings reported medical problems in up to 75% of all dental patients.¹³⁻²⁶ Age appeared to be a highly significant factor while gender seemed to demonstrate no relationship with medical problems.^{15,19-24,27} Therefore, the present study was undertaken to assess the prevalence and characteristics of medical problems in a dental school patients and to investigate if medical problems were related to patients' age and gender.

Materials and methods

Records of 4,315 patients from Chulalongkorn University Dental School in 1993 were reviewed. The information including biographic data, prevalence and the characteristics of medical history were collected. All patients were 13 years old or older. Each patient was interviewed for medical history by a dental student at the admission visit and the information was verified by a faculty staff. A tabulation was made of the medical status by category and condition. Five categories

of medical problems which were significantly relevant to dental treatment were included. There were 1) Cardiovascular diseases (CVD): hypertension, angina pectoris, rheumatic heart disease (RHD) and other heart problems; 2) Endocrine disorders: diabetes mellitus, hyperthyroidism and hypothyroidism; 3) Blood diseases; 4) Infectious diseases: tuberculosis (TB), hepatitis, sexual transmitted diseases (STD) and Human Immunodeficiency Virus (HIV) infection and 5) Adverse drug reactions: antimicrobials, analgesics and other miscellaneous drugs.

For comparison of the differences among age groups, the patients were divided into three age groups: the young (13-29 years), the adult (30-59 years) and the old (60 years or older) age groups.

Statistical analysis

Data analysis was performed by the Statview 3.0 program (Abacus concepts, Inc., Berkeley, CA). Data were expressed in number and percentage of the total patients. Comparison of the differences between age and gender groups were analysed by a Chi-Square test, significance of the differences was selected at $p < 0.01$.

Results

Of the 4,315 patients surveyed, 1,747 (40.5%) were males and 2,568 (59.5%) were females. The mean age of the patients was 33 years old (S.D = 15 years) with a range of 13 to 91 years. The age distribution was: 2,167 (50.2%) were 13 to 29 years, 879 (20.4%) were 30 to 39 years, 564 (13.1%) were 40 to 49 years, 371 (8.6%) were 50 to 59 years and 334 (7.7%) were 60 to 91 years as presented in Table 1. According to age groups, there were 2,167 (50.2%) patients in the young group, 1,814 (42.1%) patients in the adult group and 334 (7.7%) patients in the old group.

There were 806 (18.7%) patients reported medical problems. Since some patients had more than one medical problems, the total number of problems exceeded the number of patients who reported medical problems. There were 978 medical problems identified. Among the patients who reported medical problems, 656 (81.4%) patients reported one medical problem, 131 (16.2%) patients reported 2 medical problems, 16 (2%) patients reported 3 medical problems and 3 (0.4%) reported 4 medical problems. Multiple medical problems increased as age increased (Table 1). The frequency of medical problems also increased with increasing age (Table 1). When compared among three age groups (Table 2), there were greater prevalence of medical problems ($p=0.0001$) in the old and adult patients (36.8%; 25.2%) than the young patients (10.4%)

Table 1 Distribution of dental patients reported medical problems in association with age

Age (yrs)	Total pts No (%)	Pts with medical problems No (%)	Pts with one problem No (%)	Pts with multiple problems No (%)
13-29	2,167 (50.2)	226 (10.4)	207 (9.5)	19 (0.9)
30-39	879 (20.4)	176 (20.0)	149 (16.9)	27 (3.1)
40-49	564 (13.1)	147 (26.1)	115 (20.4)	32 (5.7)
50-59	371 (8.6)	134 (36.1)	98 (26.4)	36 (9.7)
≥60	334 (7.7)	123 (36.8)	87 (26.0)	36 (10.8)
Total	4,315 (100)	806 (18.7)	656 (15.2)	150 (3.5)

pts = patients

Table 2 Distribution of dental patients according to medical problems and age groups

Medical problems	Young (n=2,167) No (%)	Adult (n=1,814) No (%)	Old (n=334) No (%)	Total (n=4,315) No (%)	p value
Adverse drug reactions	138 (6.37)	249 (13.73)	45 (13.47)	432 (10.01)	.0001*
Antimicrobials	87 (4.01)	158 (8.71)	32 (9.58)	277 (6.42)	.0001*
Other miscellaneous drugs	38 (1.75)	64 (3.53)	9 (2.69)	111 (2.57)	.0020*
Analgesics	18 (0.83)	43 (2.37)	10 (2.99)	71 (1.64)	.0001*
CVD	19 (0.88)	119 (6.56)	65 (19.46)	203 (4.70)	.0001*
Hypertension	9 (0.42)	92 (5.07)	59 (17.66)	160 (3.71)	.0001*
Other heart problems	6 (0.28)	16 (0.88)	6 (1.80)	28 (0.65)	.0015*
Angina pectoris	2 (0.09)	13 (0.72)	7 (2.10)	22 (0.51)	.0001*
RHD	3 (0.14)	5 (0.28)	2 (0.60)	10 (0.23)	.2331
Infectious diseases	54 (2.49)	91 (5.02)	12 (3.59)	157 (3.64)	.0005*
Hepatitis	36 (1.66)	49 (2.70)	4 (1.20)	89 (2.06)	.0364
TB	14 (0.65)	24 (1.32)	7 (2.10)	45 (1.04)	.0160
STD	6 (0.28)	20 (1.10)	2 (0.60)	28 (0.65)	.0054*
HIV	1 (0.05)	0 (0)	0 (0)	1 (0.02)	.6091
Endocrine disorders	6 (0.28)	51 (2.81)	29 (8.68)	86 (1.99)	.0001*
Diabetes mellitus	1 (0.05)	36 (1.98)	27 (8.08)	64 (1.48)	.0001*
Hyperthyroidism	3 (0.14)	16 (0.88)	2 (0.60)	21 (0.49)	.0034*
Hypothyroidism	2 (0.09)	1 (0.06)	0 (0)	3 (0.07)	.7992
Blood diseases	20 (0.92)	25 (1.38)	3 (0.90)	48 (1.11)	.3054
Total	226 (10.43)	457 (25.19)	123 (36.83)	806 (18.68)	.0001*

Some patients reported more than one medical problems

* Chi-Square test, significant differences among groups; $p < 0.01$

Table 3 Distribution of dental patients according to medical problems and gender

<i>Medical problems</i>	<i>Male (n=1,747) No (%)</i>	<i>Female (n=2,568) No (%)</i>	<i>Total (n=4,315) No (%)</i>	<i>p value</i>
Adverse drug reactions	143 (8.18)	289 (11.25)	432 (10.01)	.0042*
Antimicrobials	105 (6.01)	172 (6.70)	277 (6.42)	.3657
Other miscellaneous drugs	23 (1.32)	88 (3.43)	111 (2.57)	.0001*
Analgesics	20 (1.14)	51 (1.99)	71 (1.64)	.0330
CVD	79 (4.52)	124 (4.83)	203 (4.70)	.3604
Hypertension	68 (3.89)	92 (3.58)	160 (3.71)	.5970
Other heart problems	5 (0.29)	23 (0.89)	28 (0.65)	.0144
Angina pectoris	7 (0.40)	15 (0.58)	22 (0.51)	.4063
RHD	3 (0.17)	7 (0.27)	10 (0.23)	.4988
Infectious diseases	88 (5.04)	69 (2.69)	157 (3.64)	.0001*
Hepatitis	44 (2.52)	45 (1.75)	89 (2.06)	.0821
TB	27 (1.55)	18 (0.70)	45 (1.04)	.0073*
STD	23 (1.32)	5 (0.19)	28 (0.65)	.0001*
HIV	0 (0)	1 (0.04)	1 (0.02)	.4094
Endocrine disorders	34 (1.95)	52 (2.03)	86 (1.99)	.5063
Diabetes mellitus	31 (1.77)	33 (1.29)	64 (1.48)	.1917
Hyperthyroidism	3 (0.17)	18 (0.70)	21 (0.49)	.0142
Hypothyroidism	0 (0)	3 (0.12)	3 (0.07)	.1530
Blood diseases	18 (1.03)	30 (1.17)	48 (1.11)	.6716
Total	307 (17.57)	499 (19.43)	806 (18.68)	.4894

Some patients reported more than one medical problems

* Chi-Square test, significant differences among groups; $p < 0.01$

There were 307 (38.1%) males and 499 (61.9%) females who reported medical problems. Statistical analysis showed no significant differences in the presence of medical problems between males and females. Prevalence of medical problems by gender were presented in Table 3. Adverse drug reactions were reported significantly higher in females than in males ($p = .004$). Infectious diseases were reported significantly more often by males than females ($p = .0001$).

Frequency distribution of patients with medical problems by category were illustrated in Figure 1. Adverse drug reactions (46.6%) and CVD (21.9%) were the major medical conditions found in this population studied. The remaining were distributed among infectious diseases (17%), endocrine disorders (9.3%) and blood diseases (5.2%)

Adverse drug reactions were reported in 432 (10%) patients. Among this category, antimicrobial drug reactions were the most common. The old and adult patients showed significantly higher frequency of drug reactions than the young (13.5%; 13.7% vs 6.4%; $p = .0001$). Adverse drug reactions were higher in females than in males (11.2% vs 8.2%; $p = .004$) These differences were from adverse reaction in other miscellaneous drugs

subcategory (3.4% vs 1.3%; $p = .0001$).

Cardiovascular diseases, the second most common medical problems, comprised of 203 (4.7%) patients. Distribution of patients with CVD problems was illustrated in Fig 2. The CVD problems were reported significantly ($p = .0001$) more often by the old than the adult and young groups (19.5% vs 6.6%; 0.9%). Hypertension was the primary condition. Hypertension was reported significantly ($p = .0001$) more often by the old group (17.7%) than the adult and young groups (5.1%; 0.4%) Angina pectoris was the second most common condition in the CVD category and the old also reported this condition more often ($p = .0001$) than the adult and young patients (2.1% vs 0.7%; 0.1%). No differences in rheumatic heart diseases reported among age groups studied. In other heart problems subcategory, the old reported more often ($p = .0015$) than the adult and young (1.8% vs 0.9%; 0.3%). There were no differences in prevalence of cardiovascular diseases between male and female patients.

Infectious diseases ranked third and found in 157 (3.6%) patients. Adult patients showed the highest frequency reported (5%), compared to 3.6% in the old and 2.5% in the young groups ($p = .0005$). Among this category, hepatitis was the most common while

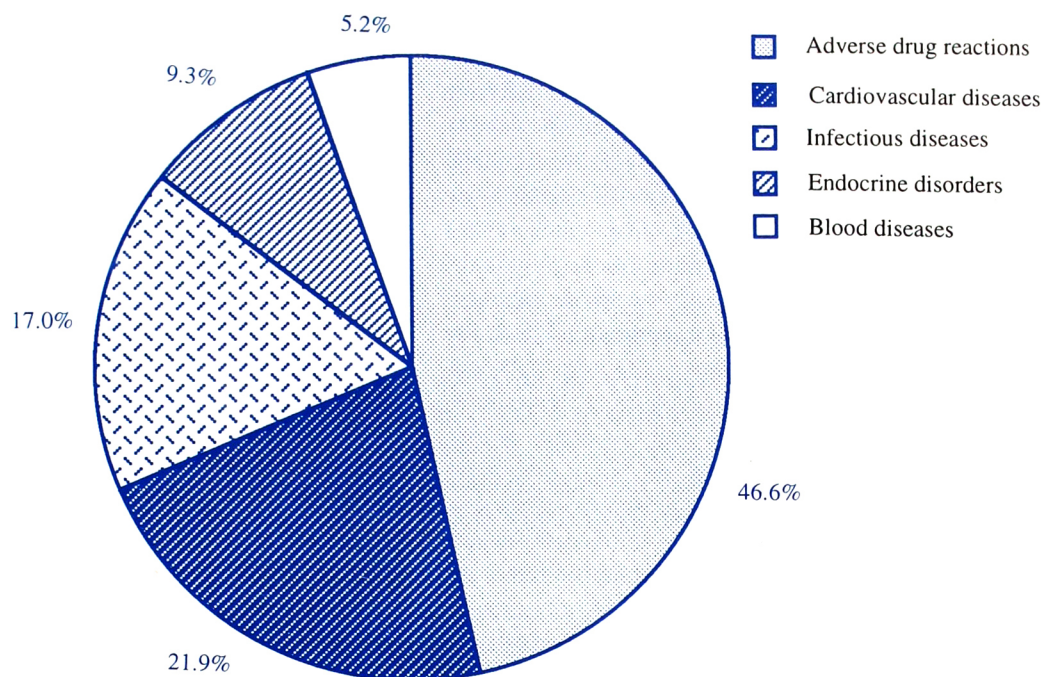


Fig 1 Frequency distribution of patients with medical problems by category.

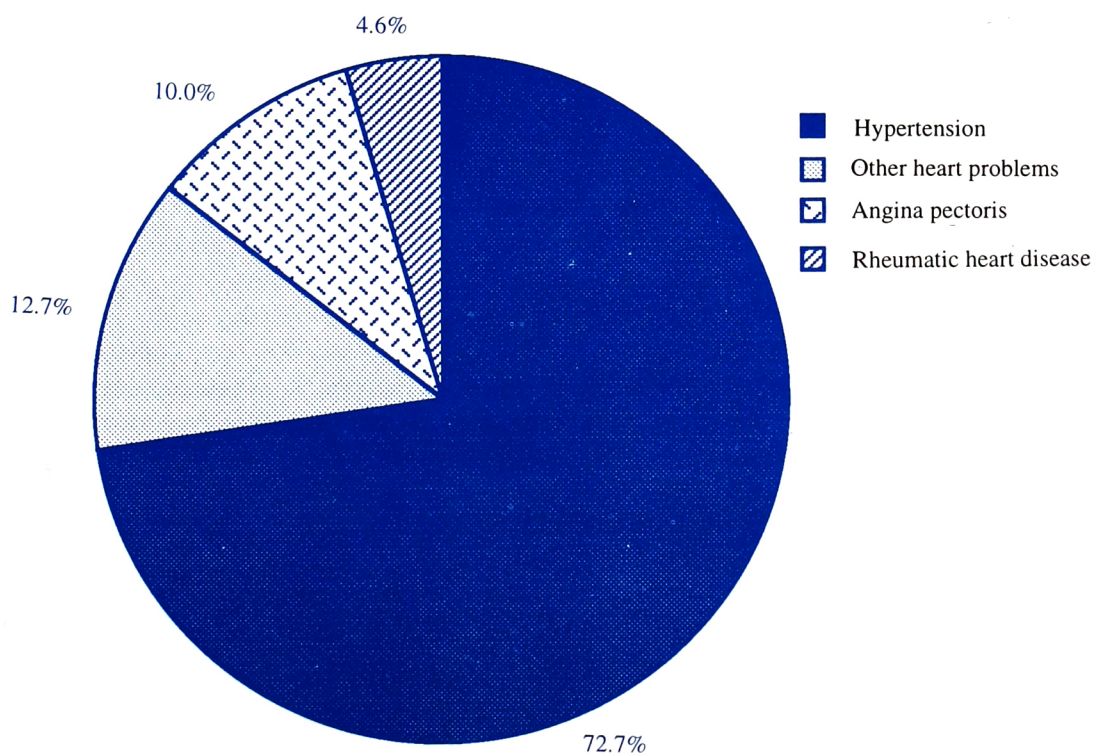


Fig 2 Distribution of patients with cardiovascular diseases.

tuberculosis was the second and STD was the third. STD was reported more often ($p = .0054$) in adult when compared to the old and young (1.1% vs 0.6%; 0.3%). No significant differences in hepatitis, tuberculosis and HIV infection reported among the three age groups studied ($p > 0.01$). Infectious diseases differed significantly between males and females (5.0% vs 2.7%; $p = .0001$). Tuberculosis was reported more often ($p = .007$) by males than females (1.6% vs 0.7%). STD was also reported more often ($p = .0001$) by males than females (1.3% vs 0.2%). There was only one HIV-seropositive female patient reported in this study.

Endocrine disorders were reported in 86 (2%) patients. Endocrine disorders were highest ($p = .0001$) in the old (8.7%) as compared to the adult (2.8%) and the young (0.3%). Diabetes mellitus was the most common endocrine disorders. It was reported significantly more

often ($p = .0001$) in the old group than in the adult and young groups (8.1% vs 2%; 0.05%). Adult patients reported hyperthyroidism more often than the old and young (0.9% vs 0.6%; 0.1%; $p = .003$). There were no differences in hypothyroidism found among three age groups studied. Males and females did not differ in prevalence of endocrine disorders.

Blood diseases were reported in 48 (1.1%) patients. Neither age groups or gender showed significant differences in prevalence of blood diseases.

Ranking of the medical problems (Table 4) demonstrated some differences among the three age groups studied. In the young and adult patients, adverse drug reactions were the most common medical problems whereas in the old patients, CVD were the most common.

Table 4 Comparison of medical problems in three age groups studied by rank order

<i>Young</i>	<i>Adult</i>	<i>Old</i>
Adverse drug reactions	Adverse drug reactions	Cardiovascular diseases
Infectious diseases	Cardiovascular diseases	Adverse drug reactions
Blood diseases	Infectious diseases	Endocrine disorders
Cardiovascular diseases	Endocrine disorders	Infectious diseases
Endocrine disorders	Blood diseases	Blood diseases

Table 5 Comparison of prevalence of medical problems among studies

<i>Study</i>	<i>% of medical problem</i>	<i>Age of subject (yrs)</i>
McLundie et al., 1969	25.3	non-available
Brasher and Rees, 1970	47.3	19-79
Picozzi and Neidle, 1973	2.5	non-available
Rees and Brasher, 1974	39.9	15-59
Halpern, 1975	13.6	non-available
Suomi et al., 1975	56.0	21-58
LeMasney, 1977	15.8	4-14
Cottone and Kafrawy, 1979	68.5	12-70
Sonis et al., 1983	48.0 (general practice)	33 (mean age)
	56.0 (hospital practice)	38 (mean age)
	64.0 (specialty practice)	43 (mean age)
Nery et al., 1987	27.6 (private office)	non-available
	46.3 (academic dental center)	
	74.1 (hospital dental center)	
Rhodus et al., 1989	7.3 (1976)	46.7 (mean age)
	24.6 (1986)	44.9 (mean age)
McDermott et al., 1990	26.9	65-89
Saengsirinavin et al., 1990	55.4	10->59
Umino and Nagao, 1993	64.2	77 (mean age)
Peacock and Carson, 1995	52.5	18-78
Present study	18.7	33 (mean age)

Discussion

In this study, the frequency of medical problems differed significantly among the three age groups. The highest frequency of medical problems was noted in the old age group (36.8%). Umino and Nagao²⁵ reported as high as 64.2% of medical problems in their old age

studied population. Jastak and Cowan²⁸ stated that the older the patients, the more systemic diseases could be expected. In addition we found that older persons tended to have multiple medical problems than the young. Our data also showed the frequency of medical problems

increased with age, agreed with previous studies that age was a significant factor.^{14,16,19-21,24,26,27} Comparison of the prevalence of medical problems among different studies were presented in Table 5. Our results, in average 18.7% of the patients reported medical problems. This number was lower than some other studies.^{1,20-26} This could be explained by the fact that most of our patient population were younger (average age = 33 years). However, in older individuals frequency of medical problems increased up to 25.2% and 36.8%. The current results were similar to other previous studies^{1,20,27} that CVD were the most common medical problems especially in older patients and of these hypertension was the most prevalent CVD problems. In this study, adverse drug reactions and diseases of cardiovascular system were the most common medical problems found which were consistent with Sonis et al.²⁰ and Peacock and Carson.²⁶ Adverse drug reactions were reported 10%, which was lower than the prevalence of allergies (19.6%) reported in Saengsirinavin and coworkers.²⁴ Their number was higher because allergies from other causes were included in their study. Many new medications are available in the market today, thus we can expect the increase number of patients taking more drugs that may have adverse dental effects. Miller and colleagues²⁹ stated that dentist should be aware of patient's medications and the effects those drugs had on dental treatment. Since the frequency of adverse drug reactions reported ranked first and was 46.6% of the medical problems in this study, thoroughly interview of patients' drug used before dental treatment or prescribing medications for dental patients is encouraged. Oaksas³⁰ studied potential drug reactions and reported that the taking and interpretation of a medical history before the prescribing of drugs had prevented 71.8% of adverse drug reactions.

Gender appeared to be related to some medical problems in our study. Adverse drug reactions were reported more often in females than in males. Females probably used more medications than males and that more adverse drug reactions were possible. Several previous studies have reported more women took medications than men.^{1,29} Infectious diseases including tuberculosis and STD were reported more often by males than females.

Previous studies regarding medical conditions in dental patients supported the need of medical history taking in dental patients.¹³⁻²⁶ The data found in our study also reinforced the need for the dentist to be able to take and interpret a comprehensive medical history. In the past, dentist might treat every patients who could walk into the dental office without taking of medical history. Then it is possible that dentist might, in fact, treat some patients without being aware of their relevant medical history. Today dentist can no longer treat only oral diseases, he should also be knowledgeable in general

medicines. Dental practitioners must be aware of the patients' medical history before proceeding with treatment. Furthermore, dentist must be able to identify the medical problems which necessitated some dental management modification. If there is some doubt concerning the patient's physical status, dentist should consult with the patient's physician. Medical consultation is indicated for dental patients reporting an unknown status of systemic conditions or symptoms that may be the manifestation of systemic diseases which commonly caused modification of dental treatment. Dentist must understand how the disorders can affect anticipated dental treatment, and of what modifications should be carried out.⁷ In patient whose medical status is of significant impaired, dental treatment must be kept at a minimum. Palliative or emergency treatment may be performed in order to relieve patient discomfort. Definitive care should be administered at a later day when the patient medical condition is undercontrolled. In brief, Evans⁷ recommended routine procedures to evaluate and treat all dental patients as follows: 1) A thorough medical history before any dental treatment; 2) A complete dental clinical and radiographic evaluation; 3) Development of a dental treatment plan and alternative plans; 4) Medical consultation when indicated; 5) Modification of treatment plan when necessary; 6) Delivery care to the patient.

Conclusions

In this study, 18.7% of the patients reported at least one medical problem. Adverse drug reactions and cardiovascular diseases were the most common medical problems reported. Age was related to the presence of medical problems. The prevalence and frequency of medical problems varied among age groups studied. The data showed greater prevalence of medical problems in the old and adult when compared to the young. The old also showed tendency of having multiple medical problems. There were no significant differences in the presence of medical problems between males and females. However, adverse drug reactions were reported more often in females but infectious diseases were reported more often in males. The data in this study supported the necessity of taking medical history before the dental treatment was initiated.

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