Prevalence of systemic diseases in Brisbane general and periodontal practice patients

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Abstract

Background: Periodontitis has been associated with a number of systemic diseases such as atherosclerosis, coronary heart diseases, and respiratory diseases. This study aimed to determine whether there is a significant difference in the prevalence of systemic diseases (a) in patients referred for periodontal care compared to the general practice population, (b) in patients attending a public hospital and private practices, (c) in patients attending public and private periodontal practices, and (d) among patients with periodontitis of varying severity.

Methods: Charts of 1000 adult patients were selected from four clinics (University of Queensland (UQ) School of Dentistry Admissions Clinic, UQ School of Dentistry Periodontics Clinic, Private Periodontal Practice, and Private General Dental Practice). The prevalence of medical conditions was evaluated using validated self-reported health questionnaires. The periodontal condition was assessed from the most recent relevant radiographs in the files.

Results: Periodontal patients had a higher prevalence of systemic diseases compared to the general practice population. Public patients had a greater prevalence of systemic diseases compared to patients in private practice for both general practice and periodontal patients. In patients with advanced periodontitis, bronchitis, hepatitis and rheumatoid arthritis were most prevalent. Patients with periodontitis also took more medications and were more likely to suffer from multiple conditions compared to the general dental population.

Conclusions: Patients attending public dental facilities have an increased prevalence of systemic disease compared to those attending private practices. Furthermore periodontal patients have a greater prevalence of diseases compared to general practice patients. Patients with moderate or advanced periodontitis show an increase in the prevalence of some systemic diseases previously reported to be risk factors for periodontal disease.

Key words: Periodontitis, systemic disease, risk factors.

INTRODUCTION

The data from all racial populations show that the prevalence of periodontal disease around the world ranges between 5 and 20 per cent.[1] The prevalence of periodontitis and the extent of attachment loss both increase considerably with age.[2] Periodontitis, a chronic inflammatory disease,[3] has been associated with an increasing number of systemic diseases such as cardiovascular disease, respiratory disease, diabetes and adverse pregnancy outcomes.[4-7]

Studies on the prevalence of systemic diseases in the elderly have shown that 64.2 per cent of the subjects have one or more systemic conditions.[8] Studies which included patients with periodontal disease found that 47.3 per cent suffered from a systemic disorder. However, as age increased a steady increase was found in the percentage of systemic conditions reported. The frequency of systemic disorders in these patients increased from 21.1 per cent in the youngest age group to 76.9 per cent in the oldest age group.[9]

Cottone and Kafrawy,[10] investigated a group of 4365 dental patients and found that 68.5 per cent suffered from at least one medical condition and 37.9 per cent of individuals had multiple conditions. A review of 1083 records from patients in a general dental practice, a suburban periodontal practice and a teaching hospital indicated that, the frequency of medical problems exceeded 50 per cent.[11] In a more recent study, the frequency of medical conditions in 590 periodontal patients was examined, utilizing a self-administered health questionnaire. It was found that 52.5 per cent of patients reported a positive finding in their medical history, with drug allergies and cardiovascular

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disorders being the most frequently found conditions and that the frequency of systemic diseases increased with increasing age.[12] An understanding of the prevalence of various systemic conditions in dental patients is important from a clinical standpoint and also from a public health planning position with implications for workforce planning, case mix and health care worker training. To date there appears to be little, if any, published evidence of systemic conditions in Australian dental patients.

In this study we have investigated the hypothesis that patients attending periodontal practices are more likely to have a higher prevalence of a wide range of systemic conditions than individuals attending general practices. In other words, periodontal patients are more likely to be generally 'unhealthy' compared to the general dental population. The aim of this study was to determine whether there is a significant difference in the prevalence of systemic diseases (a) in patients of periodontal practices compared to the general practice population, (b) in patients attending a public hospital and private practices, (c) in patients attending public and private periodontal practices, and (d) among patients with periodontitis and different degrees of severity.

MATERIALS AND METHODS

Prior to commencement of this study, ethical approval was obtained from the Human Ethics Committee of the University of Queensland.

Chart selection

A total of 1000 patient charts were sequentially selected from four types of clinics. The charts were taken from the files starting from a randomly selected starting point and assessed. Charts were filed alphabetically and used at least once in the previous seven years. When a chart achieved all the inclusion criteria, the data from that particular chart were recorded. Equal numbers of charts were selected from the University of Queensland School of Dentistry General Admissions Clinic (UQG), the University of Queensland School of Dentistry Periodontics Clinic (UQP), a Brisbane private periodontal practice (PPP) and a Brisbane private general dental practice (PGP). General clinics (UQG and PGP) obviously contained some patients with periodontal disease (but not considered severe enough to warrant periodontal referral) whereas the periodontal clinics (UQP and PPP) were only seeing patients referred for periodontal treatment. All clinics were based in Brisbane, drawing on patients almost exclusively from Brisbane. As a general statement, patients attending private clinics (PrP, i.e., PGP and PPP) were from moderate to higher socioeconomic background where as those attending university clinics (UQ, i.e., UQG and UQP) were of a low to moderate socioeconomic background. Greater than 66 per cent of UQ patients are healthcare card carriers. While there is little understanding of the rate of healthcare card carriers accessing private dental care,

Table 1. Information retrieved from patient records

- Gender
- Age (calculated from birth date)
- employment status (in paid fulltime employment or not)
- The following conditions were assessed based on the question 'Do you or have you ever experienced . . .'
  - chest pain
  - heart disorders of any kind
  - hypertension
  - bronchitis
  - asthma
  - diabetes
  - epilepsy
  - psychiatric disorders
  - hepatitis
  - prolonged bleeding
  - anemia
  - allergy
  - rheumatoid arthritis
  - rheumatic fever
  - HIV
  - tumors
  - any other disease

the anecdotal evidence would suggest that it is low due to the obvious financial burden imposed by private care.

Assessment criteria

The criteria for inclusion in the study were that patients had to be adult (at least 18 years) and either fully or partially dentate with either panoramic, or sufficient periapical or bite-wing radiographs available for assessment. The assessment for the presence of medical conditions past or present used the health questionnaire of each clinic. The information which was retrieved from each patient's record is listed in Table 1. Furthermore, information regarding the use of medications (only prescription or pharmacy only supplied medications, not vitamins etc.) was also recorded. The questions on health conditions were yes or no questions. Where no response was indicated it was assumed that this was a negative response.

The periodontal evaluation was based on the most recent radiographs in the patient files using the modified Hugoson and Jordan[13,14] radiographic classification for periodontal disease. This classification uses estimates of past periodontal bone destruction to quantitate periodontal disease history. It allows a four step classification from none to severe periodontal disease destruction. For the purposes of this study the lesser two categories have been combined (P0P1) as have the more severe categories (P2P3) to allow comparison between those with minor or no disease and those with more advanced destruction.

The use of radiographs as opposed to clinical charting avoided issues of attachment loss versus pocket depth being recorded as detailed recession recordings were not always available. It could be argued that the use of the radiographic index underestimates true disease extent, but when used in the groupings noted above is designed to give a true estimate of the prevalence of clinically significant disease.

Validation of Self-Reported Health Questionnaire (SRHQ)

A random sample of 100 patients attending the University of Queensland School of Dentistry were requested to complete a modified medical history questionnaire. The data recorded from this questionnaire were then compared to the original Self-Reported Health Questionnaire (SRHQ) of these patients, and checked for accuracy. Fifty patients were from UQG and the other 50 were patients from UQP.

Analysis of results

The Statistical Package for Social Sciences (SPSS 10.0 – Chicago, Illinois, USA) was used to assess the differences in the prevalence of medical conditions between the groups and to calculate risk estimates (OR) with 95 per cent confidence intervals. Furthermore, unadjusted comparisons between variables were analyzed using dichotomous chi-square analysis, in order to compare the sample populations.

The following associations were studied: firstly, all of the periodontal patients (PP) from both University of Queensland Periodontics Clinic (UQP) and the selected Private Periodontal Practice (PPP) were compared with all of the patients in the General Practice patients (GP) from both the University of Queensland General Admissions Clinic (UQG) and the selected Private General Practice (PGP). Secondly, patients from the University of Queensland (UQP and UQG) were compared with Private Practice patients (PPP and PGP). Thirdly, University of Queensland Periodontal patients (UQP) were compared to Private Practice Periodontal patients (PPP). Fourthly, within the periodontal group (both PPP and UQP) patients with none to mild periodontal disease were compared with PP having moderate to advanced periodontal disease.

RESULTS
Validation of SRHQ

For the validation of the SRHQ a modified medical history was given to 100 patients (50 from the UQP and the other 50 patients were from the UQG) who were requested to complete it. The data recorded from this questionnaire was compared with the original questionnaire. Overall, the results showed a 91 per cent agreement in reporting systemic diseases for both groups. For the general group 86 per cent reported their medical history identically, whereas in the periodontal group 96 per cent were in agreement with their previously answered medical questionnaire.

Comparison of all studied parameters

When comparing the four different populations according to each parameter, the results showed the following:

Gender distribution

The distribution of gender within all of the groups studied is shown in Table 2. A number of associations

Table 2. Gender distribution across all groups

	Males	Females
UQP	45.2%	54.8%
	113	137
UQG	39.6%	60.4%
	99	151
PPP	47.6%	52.4%
	119	131
PGP	44.4%	55.6%
	111	139

UQP=University of Queensland periodontal patients, UQG= University of Queensland general patients, PPP=Private Periodontal Practice, PGP=Private General Practice.
Data are presented as percentage values with actual numbers of individuals in each group.

were found between sex and some medical conditions. Males reported a significantly higher prevalence of heart disorders (OR=1.74 CI 1.07-2.82) while females reported higher prevalence of anemia (OR=4.27 CI 1.46-12.50), allergy (OR=1.59 CI 1.12-2.25) and other diseases (OR=1.69 CI 1.08-2.63). However, when gender was added to a binary logistic regression model to assess its role against the various practice types it was not significant for any of these conditions.

Age distribution

The distribution of age within all of the groups studied is shown in Table 3. As an indication of the distribution of ages, the subjects were categorized into three main groups (see Table 3).

The mean age in the PP group was 53.26 years of age, whereas in the GP group the mean age was 45.56. This difference was statistically significant (t=9.57 and p<0.01). Therefore, the patients in the PP group were found to be significantly older than the patients in the GP group. Within the periodontal groups (PPP and UQP), the age distributions were similar with the majority of patients falling into the middle age group, smaller numbers being distributed in the old age group and the smallest numbers in the young age group.

The prevalence of any medical conditions increased with increasing age in both the periodontal and general practice patients. For example, in the young age groups (20-39) the prevalence of systemic diseases was 40-50 per cent whereas in the old age groups the prevalence of systemic diseases increased significantly to 70-71.3 per cent (data not shown).

Table 3. Age distribution by categories

	Young 20-39 % mean	Middle 40-59 % mean	Old 60-79 % mean
PP	10.9%	60.6%	28.5%
	34.39	50.00	66.80
GP	36.7%	46.9%	16.4%
	31.77	48.14	67.54
UQP	13%	56.1%	30.9%
	32.54	48.94	66.66
PPP	8.9%	65%	26%
	33.73	49.19	67.68

PP (Periodontal patients)=UQP and PPP, GP (general patients)=UQG and PGP.

Table 4. Order and percentages of periodontal and general patients reporting systemic diseases

Diseases	PP ranking	PP percentage (%)	GP ranking	GP percentage (%)	chi-square p values
Chest pain	7	5.8	7	3.4	>0.05
Heart disorders	3	9.6	5	4.8	<0.05*
Hypertension	2	15.8	3	10.2	<0.01*
Bronchitis	5	7.4	4	8.2	>0.1
Asthma	4	8.8	2	13.0	<0.05*
Diabetes	6	6.0	8	3.4	<0.0 *
Epilepsy	15	1.4	15	0.6	>0.1
Psychiatric disorders	13	1.6	6	3.6	<0.05*
Hepatitis	8	5.0	9	2.6	<0.05*
Prolonged bleeding	12	2.6	13	1.6	>0.1
Anemia	11	2.6	11	2.4	>0.1
Allergy	1	16.6	1	16.6	>0.1
Rheumatoid arthritis	10	3.6	12	1.6	<0.05*
Rheumatoid fever	14	1.6	14	0.6	>0.1
HIV	16	0.2	16	0.2	>0.1
Tumors	9	4.6	10	2.6	>0.1

PP (Periodontal patients)=UQP and PPP, GP (general patients)=UQG and PGP.
*Indicates statistically significant result p<0.05.

Medical conditions

The ranking order of percentages and p values of systemic diseases among PP and GP patients are detailed in Table 4. The most frequently reported conditions in the patients attending periodontal clinics were allergies, hypertension, heart disorders, hepatitis, diabetes, chest pain, tumors and rheumatoid arthritis. For the general practice population the most prevalent conditions were allergies, asthma, hypertension, bronchitis, heart disorders, psychiatric disorders, diabetes, chest pain, hepatitis and tumors. Of the conditions surveyed no significant differences were noted in any of the analyses between the various groups for epilepsy, psychiatric disorders, prolonged bleeding, anemia, allergies, rheumatic fever and AIDS. Only those conditions for which significant differences were noted between the periodontal groups and the general groups in one or more of the analyses (Table 5) are detailed below.

Chest pain

Although no significant differences were noted for the presence of self-reported chest pain between the PP and GP groups, chest pain was reported more often by patients attending the UQ general or periodontal clinics. In addition, UQ periodontal patients reported more chest pain than the private practice periodontal patients. If chest pain was considered in the context of heart disorders and hypertension (i.e., chest pain and a heart disorder or chest pain and hypertension thus using the symptom of chest pain as a cofactor to confirm the veracity of the reported hypertension or heart disorder), the results showed that periodontal patients had a higher prevalence of heart disorders (9.6 vs. 4.8 per cent, OR=2.11, CI 1.27-3.50) and hypertension (15.8 per cent vs. 10.2 per cent, OR=1.65, CI 1.13-2.41). If chest pain related to heart disorder and hypertension was compared in the younger age group (20-39) it was found that young patients attending periodontal practices were statistically more likely to experience chest pain (OR=3.60, CI 1.12-11.76), heart disorder (OR=7.14, CI 1.27-40.01) and hypertension (OR=6.56, CI 1.85-23.35).

Heart disorder

Periodontal patients had a higher prevalence of self-reported heart disorder than general patients, and UQ patients reported heart disorders more frequently than private practice patients. However, patients with advanced forms of periodontitis did not appear to have a higher prevalence of heart disorders compared to patients with mild periodontitis as determined by the modified Hugoson and Jordan[13,14] classification.

Hypertension

Periodontal patients showed a higher prevalence of hypertension than general practice patients, UQ patients showed a higher prevalence of hypertension than PrP patients, and UQ periodontal patients were more likely to report hypertension than private periodontal patients. Despite these findings, the prevalence of this parameter was equally reported across patients suffering mild and advanced periodontitis.

Bronchitis

Overall, there was no significant difference in the prevalence of bronchitis between the general patients and the periodontal patients. However, UQ patients more often reported bronchitis than private practice patients. Bronchitis was more prevalent in UQP patients than in PPP patients and more prevalent with patients with advanced forms of periodontal disease.

Asthma

The prevalence of asthma was higher in general patients (private and UQ). Periodontal patients under treatment at UQ were more likely to report asthma than periodontal patients treated privately. Patients with advanced forms of periodontitis reported a higher prevalence of asthma compared to patients with milder forms of the disease.

Diabetes

Periodontal patients showed a higher prevalence of diabetes than general practice patients, UQ patients

Table 5. Relationship of medical conditions within study groups

Condition	Sig diff	Increase or decrease	Odds ratio	Confidence interval
Chest pain				
PP v GP	no	–	–	–
UQ v PrP	yes	incr	15.59	4.80-50.59
UQP v PPP	yes	incr	15.01	3.53-63.85
P2P3 v P0P1	no	–	–	–
Heart disorder				
PP v GP	yes	incr	2.10	1.26-3.49
UQ v PrP	no	–	–	–
UQP v PPP	no	–	–	–
P2P3 v P0P1	no	–	–	–
Hypertension				
PP v GP	yes	incr	1.65	1.13-2.40
UQ v PrP	yes	incr	1.54	1.06-2.23
UQP v PPP	yes	incr	1.79	1.09-2.93
P2P3 v P0P1	no	–	–	–
Bronchitis				
PP v GP	no	–	–	–
UQ v PrP	yes	incr	44.63	10.90-182.81
UQP v PPP	yes	incr	20.18	4.79-84.91
P2P3 v P0P1	yes	incr	2.84	1.45-5.57
Asthma				
PP v GP	yes	decr	0.65	0.43-0.97
UQ v PrP	yes	incr	3.63	2.29-5.75
UQP v PPP	yes	incr	9.05	3.50-23.39
P2P3 v P0P1	yes	incr	2.02	1.08-3.76
Diabetes				
PP v GP	yes	incr	1.81	1.00-3.33
UQ v PrP	yes	incr	2.45	1.30-4.64
UQP v PPP	yes	incr	2.91	1.27-6.68
P2P3 v P0P1	no	–	–	–
Epilepsy				
PP v GP	no	–	–	–
UQ v PrP	yes	incr	9.15	1.15-72.47
UQP v PPP	no	–	–	–
P2P3 v P0P1	no	–	–	–
Hepatitis				
PP v GP	no	–	–	–
UQ v PrP	yes	incr	4.66	2.03-10.67
UQP v PPP	yes	incr	12.56	2.93-53-.89
P2P3 v P0P1	yes	incr	3.6	1.56-8.36
Prolonged bleeding				
PP v GP	no	–	–	–
UQ v Pr	yes	incr	6.20	1.82-21.18
UQP v PPP	yes	incr	5.73	1.26-26.13
P2P3 v P0P1	no	–	–	–
Anemia				
PP v GP	no	–	–	–
UQ v PrP	yes	incr	5.44	1.85-15.95
UQP v PPP	yes	incr	12.55	1.62-97.30
P2P3 v P0P1	no	–	–	–
Rheumatoid arthritis				
PP v GP	yes	incr	2.29	1.00-5.33
UQ v PrP	yes	incr	4.34	1.62-11.6
UQP v PPP	yes	incr	5.2	1.5-18.38
P2P3 v P0P1	yes	incr	2.45	1.00-6.31
Tumors				
PP v GP	no	–	–	–
UQ v PrP	yes	incr	2.34	1.14-4.81
UQP v PPP	no	–	–	–
P2P3 v P0P1	no	–	–	–

Abbreviations: incr=increase; decr=decrease; –=no change.
See text for group abbreviators.
Only conditions with any significant results have been included.

showed a higher prevalence of diabetes than PrP patients, and UQ periodontal patients were more likely to report diabetes than private periodontal patients. However, the prevalence of this parameter was equally reported across patients suffering mild and advanced periodontitis.

Hepatitis

Periodontal patients displayed a trend towards a higher prevalence of hepatitis than general patients but this was not statistically significant. UQ patients were found to be more likely to report hepatitis than PrP patients. Moreover, UQ periodontal patients were

found to have a higher prevalence of hepatitis than private periodontal patients. In addition, patients suffering advanced forms of periodontitis showed a higher prevalence of hepatitis compared with patients with mild periodontitis.

Prolonged bleeding and anemia

Although no significant differences were noted for the presence of self-reported bleeding disorders or anemia between the PP and GP groups, both conditions were reported more often by patients attending UQG general or UQP. In addition, UQ periodontal patients reported more bleeding disorders and the presence of anemia than the private practice periodontal patients. The severity of the periodontal condition did not seem to affect the incidence of reporting of these two conditions.

Rheumatoid arthritis (RA)

Periodontal patients had a higher prevalence of RA than general patients, and UQ patients were found to be more likely to report RA than PrP patients. Moreover, UQ periodontal patients were found to have a higher prevalence of RA than private periodontal patients. Further, patients suffering from advanced periodontitis showed a higher prevalence of RA if compared to patients with mild periodontitis.

Use of medications
One medication

Periodontal patients showed a higher prevalence of taking one medication compared to the general practice patients (OR=1.73, CI 1.17-2.54), and UQ patients reported a slightly higher prevalence of taking one medication over the PrP patients but this was not significant (OR=1.10, CI 0.75-1.60). Similarly, UQ periodontal patients were found to have a slightly higher prevalence of taking one medication compared to the private periodontal patients which again was not significant (OR=1.20, CI 0.74-1.97). Patients suffering advanced periodontitis were also slightly more likely to take one medication than patients reporting mild periodontitis, although this was also not significant (OR=1.05, CI 0.63-1.75).

More than one medication

Periodontal patients showed a higher prevalence of taking more than one medication compared to the general patients (OR=2.56, CI 1.62-4.03), and UQ patients reported a higher prevalence of taking more than one medication over the PrP patients (OR=1.71, CI 1.11-2.62). Moreover, UQ periodontal patients were found to have a higher prevalence of taking more than one medication compared to private periodontal patients (OR=2.7, CI 1.57-4.76).

Number of medical conditions
One disease

Periodontal patients showed a higher prevalence of reporting more than one disease compared to general patients (OR=1.44, CI 1.08-1.93), and UQ patients reported a higher prevalence of reporting more than one disease than PrP patients (OR=4.07, CI 2.96-5.61). Moreover, UQ periodontal patients were found to have a higher prevalence of more than one disease than private periodontal patients (OR=4.10, CI 2.67-6.31). Further, patients suffering advanced periodontitis were more likely to report more than one disease than patients reporting mild periodontitis (OR=1.99, CI 1.33-2.97).

Presence of diseases other than those categorized

Periodontal patients showed a higher prevalence of reporting 'other diseases' than general patients, and UQ patients showed a higher prevalence of reporting 'other diseases' than PrP patients. Moreover, UQ periodontal patients were found to have a higher prevalence of these other diseases than private periodontal patients. Further, patients suffering advanced periodontitis were more likely to report 'other diseases' than patients reporting mild periodontitis.

DISCUSSION

Using data obtained from SRHQ we have been able to determine the extent of medical conditions reported by patients attending general dental practices and specialist periodontal practices. Most health centres use SRHQ for the assessment of the patient's medical history. Many studies have shown the superiority of the SRHQ regarding the identification of important medical conditions, compared with a verbal inquiry at the chair side.[15-17] Studies have shown that SRHQ can be reliably used for clinical or social survey research.[18,19]

The frequency of medical problems experienced by dental patients varied between the types of practices studied. The percentage of patients with one systemic disease was higher in patients attending periodontal practices, compared with the general practice patients. It was also higher in patients treated at UQ, and higher in patients attending the periodontal clinic at UQ compared with patients treated in private specialist periodontal practice. The prevalence of *multiple* medical conditions was also higher in patients attending periodontal practices compared with patients in general practices, higher in the UQ patients compared with private patients and higher in the UQ periodontal patients compared with the private periodontal ones. The category with the least medical conditions was the private general practice.

The results of this study showed that 60 per cent of the periodontal patients reported one or multiple systemic diseases, and this is somewhat higher than those reported in other studies. For example, one study has shown that the prevalence of systemic diseases in periodontal patients was 52.5 per cent.[12] Such a difference could be attributed to the fact that in the Peacock and Carson[12] study, the patients reported one positive systemic disease whereas in this study the patients reported one or more systemic conditions.

The prevalence of systemic diseases in the general dental patients in the present study was 49.2 per cent. This finding is less than that reported by Suomi *et al.*,[19] in which the prevalence of systemic conditions in general dental patients was found to be 55.8 per cent. Although the number of participants was approximately the same in both studies, the discrepancies in the results could be explained by the fact that in the Suomi study, the SRHQ included diseases such as gastrointestinal, lung, and liver or kidney diseases and hormonal disturbances, which were not specifically included in the present study. In our study, these conditions were included under the heading 'other diseases'. Other studies have reported a 35.4 per cent prevalence of systemic diseases in the general population.[20]

It should be emphasized that this study is largely descriptive in nature, and makes no attempt to attribute oral status to any particular systemic condition or vise versa. In a similar manner while significant co-morbidities like smoking have not been controlled for in this study it is not based upon case control and has not attempted to investigate the pathogenesis of any of the conditions, rather it has set out to describe the situation *as it is*. The authors leave it to others to explain the reasoning behind the findings of this study. In part, the obvious differences in age between the categories of patients may account for much of the variation seen, yet this does not detract from the fundamental result that some categories of patients are older and do have a greater number of systemic conditions.

In the present study the most frequent conditions found in patients attending periodontal clinics were: allergies, hypertension, heart disorders, asthma, bronchitis, hepatitis, diabetes, chest pain, tumors and rheumatoid arthritis. This is in agreement with previous studies on patients with periodontitis where allergies, hypertension and other heart disorders were the most prevalent conditions reported.[12]

In the general patient group the most prevalent diseases were: allergies, asthma, hypertension, bronchitis, heart disorders, psychiatric disorders, diabetes, chest pain, hepatitis and tumors. For this group allergies appear to be the most prevalent parameter.[9,19]

The prevalence of medical conditions increased with increasing age in both the periodontal and general practice patients. This is in agreement with other studies reporting that the prevalence of systemic diseases in these populations increases with increasing age.[11,12,17,21]

With respect to medications, the periodontal group appeared to take more medications than the general population group. From the 1000 subjects studied, 44 per cent reported receiving one or more medications. These results are in good agreement with a study of 4365 subjects, in which the prevalence of receiving a medication was 43.1 per cent (109).

Chest pain is not a disease as such, but rather a symptom of systemic diseases such as cardiovascular disease, hypertension, pulmonary disease and asthma. Patients at periodontal clinics appeared to experience more chest pain than the general practice population. When chest pain was considered in the context of heart disorders and hypertension, the results showed that periodontal patients have a higher prevalence of heart disorders and hypertension. If chest pain related to heart disorder and hypertension was compared in the young age group (20-39) it was noted that that young patients attending periodontal clinics were statistically more likely to experience chest pain, heart disorder and hypertension. However, with the older patients the association was not as evident. This may be due to other factors such as smoking, diet and other diseases that are confounding factors, which may also be associated with age. Because this study had wide upper confidence intervals for these parameters, and because smoking was not assessed, it is not clear whether the results provide indications of what could be considered a strong association between chest pain and heart disorders in young age groups. Further studies are needed in order to provide more evidence for the association and risk estimates of chest pain, hypertension and heart disorders in young age groups attending periodontal practices.

Bronchitis was more prevalent in periodontal patients and, in addition, was more prevalent in patients with moderate to advanced periodontal disease. This could be explained by the fact that periodontal patients have a higher prevalence of smoking.[22] Although in this study smoking was not assessed, it is known that smoking causes bronchitis and increases the prevalence and severity of periodontitis.[23]

In converse to bronchitis, asthma seemed to be negatively associated with attendance at periodontal clinics. General patients reported a higher prevalence of asthma than patients attending periodontal clinics from both UQ and private practice. Since asthma is considered to be more prevalent in young people than in the older individuals, and periodontal disease in more prevalent in older people than in the younger ones, this could in part explain such results. It is well documented that Australians (particularly younger patients) have a high prevalence of asthma relative to many other countries.[24]

Periodontal patients from all three age groups studied had a higher prevalence of diabetes. Diabetes was also more prevalent among UQ patients than private practice patients, and moreover, UQ patients were 2.45 more likely to have diabetes if compared with periodontal private patients. Since diabetes is a well recognized risk factor for periodontitis[25] these findings were not unexpected.

Rheumatoid arthritis was found to be strongly associated with patients attending periodontal clinics and this finding was consistent with other reports of the association of RA and periodontitis and its severity.[14,26]

CONCLUSION

In conclusion, and within the limitations of this study, it appears that patients of periodontal practices have a higher prevalence of systemic diseases compared with the general practice population. Furthermore, patients attending the periodontal clinic at UQ had a higher prevalence of medical conditions than patients with periodontal disease treated in private periodontal practice. Assuming patients with more advanced forms of periodontal disease are those that are referred to periodontal practices it seems that having moderate or advanced forms of periodontitis is not only associated with an increase in the prevalence of overall systemic diseases but also an increase in the prevalence of diseases that have been reported to be risk factors for periodontal disease. In general it seems that patients referred for periodontal care are less healthy than their counterparts in the general dental population.

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