Periodontal disease among public dental patients

THE UNIVERSITY OF ADELAIDE
AUSTRALIA

AIHW
AUSTRALIAN INSTITUTE OF HEALTH & WELFARE

Periodontal diseases comprise a group of inflammatory diseases that affect the gums, deeper connective tissues and jaw bone, all of which support the teeth (AIHW 2002). Periodontal diseases have been estimated to be among the most prevalent health problems in Australia (AIHW 2000). Public dental patients are generally holders of government health cards, such as the unemployed and aged pensioners. These card-holders represent a financially disadvantaged group of adults within the Australian population. While adults in general have benefited from improved oral health in terms of reductions in tooth loss, public dental patients remain a group with access difficulties and reported high levels of emergency care and tooth extraction (DSRU, 1993).

This report describes the periodontal status of public dental patients by age, sex and type of visit based on a total of 2,746 dental patients who were examined by the dental authorities in four States/Territories of Australia, providing a representative sample of the public dental patients they treated during the 2001–02 period.

Edentulism

Periodontal status is measured only among patients with their own natural teeth. Table 1 shows that edentulous patients (i.e, those with no natural teeth) comprise only a small percentage of public patients, with higher percentages among older age groups and among general compared with emergency patients, with similar percentages for males compared with females.

Table 1: Edentulism among public patients by sex, visit type and age group (%)

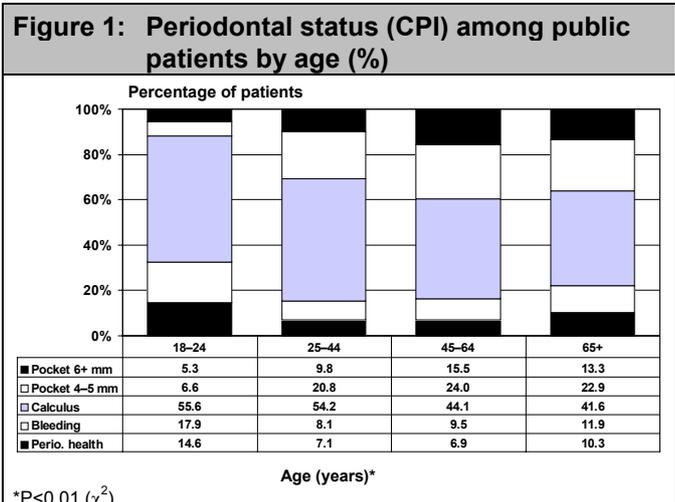|	Sex of patient		Visit type	
	Male	Female	Emergency	General
Age group				
18–24 years	0.0	0.0	0.0	0.0
25–44 years	1.9	0.8	0.0	3.5
45–64 years	6.5	5.6	2.6	9.4
65+ years	16.5	15.8	10.7	19.9
All	**8.2**	**6.6**	**3.4**	**11.7**

Patient and visit characteristics

The distributions of sex of patient and visit type are presented in Table 2 by age group. Both male and female patients had similar age distributions, with the highest percentage of patients in the 25–44 years age group. A higher percentage of emergency care patients were in younger age groups (e.g., 10.1% were aged 18–24 years compared with 3.3% for general care).

Table 2: Sex and visit type by age group (%)

	Sex of patient		Visit type	
	Male	Female	Emergency	General
Age group				
18–24 years	7.1	6.9	10.1	3.3
25–44 years	33.5	36.8	40.2	29.5
45–64 years	27.1	29.9	26.5	31.5
65+ years	32.3	26.4	23.2	35.7

Note: The data in this table relate to dentate persons aged 18 years or more.

Periodontal status by age of patient

Periodontal status was recorded using the Community Periodontal Index (CPI), and is presented as the percentage of patients categorised by their maximum sextant scores. Figure 1 shows that the highest percentage of patients with periodontal health as their maximum CPI score were in the 18–24 year age group, with the percentage of patients with periodontal pockets increasing across older age groups up to 45–64 years.

Figure 1: Periodontal status (CPI) among public patients by age (%)

Percentage of patients

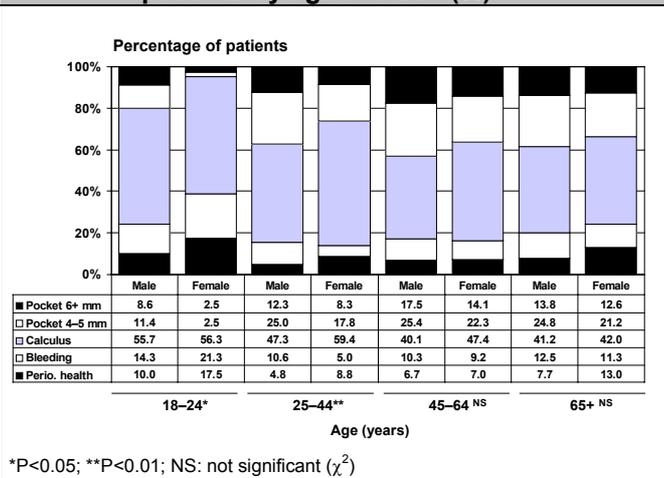| Age (years)*	18–24	25–44	45–64	65+
■ Pocket 6+ mm	5.3	9.8	15.5	13.3
□ Pocket 4–5 mm	6.6	20.8	24.0	22.9
□ Calculus	55.6	54.2	44.1	41.6
□ Bleeding	17.9	8.1	9.5	11.9
■ Perio. health	14.6	7.1	6.9	10.3

*P<0.01 (χ^2)

Periodontal status by age and sex

Figure 2 shows periodontal status by age and sex. Both male and female patients showed the characteristic pattern by age, with the percentage of patients with periodontal pockets increasing across older age groups up to 45–64 years.

A higher percentage of male patients had periodontal pockets compared with female patients in each age group, with the most pronounced differences among younger patients.

Figure 2: Periodontal status (CPI) among public patients by age and sex (%)

Percentage of patients

	Male	Female	Male	Female	Male	Female	Male	Female
■ Pocket 6+ mm	8.6	2.5	12.3	8.3	17.5	14.1	13.8	12.6
□ Pocket 4–5 mm	11.4	2.5	25.0	17.8	25.4	22.3	24.8	21.2
□ Calculus	55.7	56.3	47.3	59.4	40.1	47.4	41.2	42.0
□ Bleeding	14.3	21.3	10.6	5.0	10.3	9.2	12.5	11.3
■ Perio. health	10.0	17.5	4.8	8.8	6.7	7.0	7.7	13.0
	18–24*		25–44**		45–64 NS		65+ NS	

Age (years)

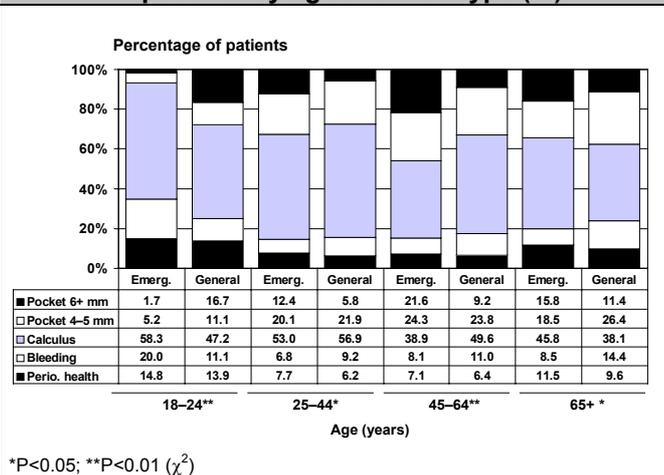*P<0.05; **P<0.01; NS: not significant (χ^2)

Periodontal status by age and visit type

Figure 3 examines periodontal status by age and visit type. Periodontal pockets varied by visit type but there were no clear trends.

A lower percentage of emergency patients had pockets (both 4–5 mm and 6+ mm) among 18–24-year-olds.

Figure 3: Periodontal status (CPI) among public patients by age and visit type (%)

Percentage of patients

	Emerg.	General	Emerg.	General	Emerg.	General	Emerg.	General
■ Pocket 6+ mm	1.7	16.7	12.4	5.8	21.6	9.2	15.8	11.4
□ Pocket 4–5 mm	5.2	11.1	20.1	21.9	24.3	23.8	18.5	26.4
□ Calculus	58.3	47.2	53.0	56.9	38.9	49.6	45.8	38.1
□ Bleeding	20.0	11.1	6.8	9.2	8.1	11.0	8.5	14.4
■ Perio. health	14.8	13.9	7.7	6.2	7.1	6.4	11.5	9.6
	18–24**		25–44*		45–64**		65+ *	

Age (years)

*P<0.05; **P<0.01 (χ^2)

However, among 25–44 and 45–64-year-olds, the percentage of patients with 4–5 mm pockets was similar between emergency and general patients, while a higher percentage of emergency patients had pockets 6+ mm compared with general patients.

In contrast, among 65+-year-olds, the percentage of patients with 6+ mm pockets was similar between emergency and general patients, while a lower percentage of emergency patients had pockets 4–5 mm compared with general patients.

Number of teeth

Patterns of periodontal disease may be influenced by the number of teeth that are present. The observation that the prevalence of pockets no longer increases past the age of 45 years may be due to a survivor effect, whereby relatively healthy teeth are retained in older age, and teeth with deep pockets are more likely to be extracted.

Table 3 shows the number of teeth present by sex, visit type and age. The number of teeth that were present declined across successively older age groups, with a similar pattern observed for both male and female patients and for emergency and general patients. Such a pattern is consistent with a survivor effect related to periodontal pockets and tooth loss by age of patient, but not by sex or visit type.

Table 3: Number of teeth: by sex, visit type and age group (mean)

	Age group (years) *				
	18–24	25–44	45–64	65+	Total
Sex NS					
Male	29.8	25.4	19.8	15.4	**20.8**
Female	30.0	25.7	19.3	15.6	**21.5**
Visit type NS					
Emergency	29.8	25.6	19.2	15.5	**21.9**
General	30.4	25.5	19.8	15.7	**20.4**
Total	**29.9**	**25.6**	**19.5**	**15.5**	**21.2**

*P<0.01; NS: not significant (ANOVA)

Note: The data in this table relate to dentate persons aged 18 years or more.

In order to more fully understand the effects of age, sex, visit type and number of teeth on periodontal status, the next section analyses the presence or absence of periodontal pockets 6+ mm using multivariate logistic regression to estimate the effect of each variable after controlling for the effects of the other variables.

Periodontal pockets

Table 4 presents the odds ratios from a logistic regression of presence of periodontal pockets 6+ mm. An odds ratio of 1.0 indicates that the odds of the outcome variable are the same for the explanatory variable in relation to the reference category. Odds ratios greater than 1.0 indicate higher odds of the outcome for the explanatory variable in relation to the reference category, and odds ratios less than 1.0 indicate lower odds of the outcome for the explanatory variable in relation to the reference category.

Table 4: Logistic regression of presence of periodontal pockets 6+ mm: by age group, sex, visit type and number of teeth

	Odds ratio	95% confidence interval		Sig.
		Lower bound	Upper bound	
Age group				
18–24 years	0.37	0.16	0.82	*0.015
25–44 years	0.67	0.46	0.97	*0.034
45–64 years	1.15	0.81	1.62	NS0.434
65+ years	1.00	reference		
Sex				
Male	1.39	1.05	1.83	*0.020
Female	1.00	reference		
Visit type				
Emergency	1.79	1.34	2.39	**0.000
General	1.00	reference		
Number of teeth				
1–10	1.00	reference		
11–31	1.49	0.55	3.66	NS0.367
32	1.42	0.63	3.54	NS0.467

*statistically significant at P<0.05 level

**statistically significant at P<0.01 level

NS: not statistically significant

Note: The data in this table relate to dentate persons aged 18 years or more.

Significant effects were observed for age of patient, sex of patient and visit type (Table 4). Younger patients showed lower odds of having pockets 6+ mm, 0.37 times lower for 18–24-year-olds and 0.67 times lower for 25–44-year-olds compared with the reference group of 65+-year-olds. Males had higher odds of pockets 6+ mm (1.39 times) compared to the reference category of female patients. Patients attending for emergency care had higher odds of pockets 6+ mm (1.79) compared with general care patients. The number of teeth was not significantly associated with pockets 6+ mm.

Adult Dental Programs Survey

The Adult Dental Programs Survey is a random sample of adult patients attending for public-funded dental care. Data were collected by State/Territory dental services on the oral health status of patients, characteristics of patients, details of visits and type of services provided.

Oral health measures were assessed by dentists during the initial visit of a course of care. Written instructions for indices (e.g., CPI) were used, but there was no formal calibration of dentists in diagnostic criteria.

Dentists were instructed to evaluate oral health status using visual and tactile information alone, in conjunction with the definitions supplied.

A periodontal probe was used to measure pocket depth (from gingival crest to the base of the pocket) and to detect subgingival calculus or bleeding.

Periodontal status was recorded using the Community Periodontal Index (World Health Organization, 1997). A score of 0 (periodontal health), 1 (gingival bleeding), 2 (calculus at any supra- or sub-gingival site), 3 (pocket of 4–5 mm), or 4 (pocket of 6 mm or more) was scored for each dentate sextant. All teeth in a sextant were examined and the most severe periodontal condition observed was recorded as the sextant score. Sextants were defined by tooth position, with molars and premolars making up four posterior sextants, and canines and incisors making up two anterior sextants. Third molars were excluded unless they were functioning in the place of second molars. Sextants were excluded (code X) when there were no teeth present or only one tooth which could be probed. If there was only one tooth in a sextant, the score for this single tooth could be carried forward for consideration in assessing the adjacent sextant.

Visit type was classified as 'emergency' if the course of care was initiated for relief of pain; otherwise visit type was classified as 'general'.

Data were weighted using the estimated number of persons whose last dental visit was public-funded within the last year for persons aged 18 years or more from the National Dental Telephone Interview Survey 1999. These weighted data are representative of the number of adults receiving public-funded dental care for each of the participating States/Territories.

Scope of data

This report is based on data collected on 2,746 patients in 2001–02 by the dental authorities in New South Wales (n=733), Queensland (n=533), Western Australia (n=1,197) and Northern Territory (n=283).

Sample size estimates were based on measures of oral health status from the 1995–96 Adult Dental Programs Survey (Brennan & Spencer 1997). To achieve estimates of key outcome variables with a precision of 20% relative standard error or less, target yields were set of 324 patients in smaller States (Tasmania) and Territories and 648 patients in mainland States. While the obtained sample yields varied between localities, limiting disaggregations in some specific localities, the total sample yield across all localities exceeded the target, thereby providing a sufficient sample size to achieve the desired level of precision.

Estimates based on users of dental services are by definition restricted to those persons who were able to access dental care and therefore may not necessarily be representative of the population eligible for public dental services who did not access public dental care during the survey period.

Summary

- Periodontal health was more common among patients in the 18–24 year age group (14.6%) compared with older age groups.

- The percentage of patients with pockets 4–5 mm increased across older age groups from 6.6% for 18–24-year-olds up to 24.0% for 45–64-year-olds, and 22.9% for 65+-year-olds.

- Periodontal pockets 6+ mm increased across older age groups from 5.3% among 18–24-year-olds up to 15.5% among 45–64-year-olds, and 13.3% among 65+-year-olds.

- Younger patients had lower odds of having pockets 6+ mm, 0.37 times lower for 18–24-year-olds and 0.67 times lower for 25–44-year-olds compared with 65+-year-olds.

- Males had higher odds of pockets 6+ mm (1.39 times) compared with female patients.

- Patients attending for emergency care had higher odds of pockets 6+ mm (1.79 times) compared with general care patients.

Acknowledgements

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