

Dental attendance patterns of patients with non-communicable diseases by six-year follow-up study

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Abstract : Objectives: The objectives of this study were to examine the medical histories of new dental patients and their attendance patterns after the initial contact.

Methods: Medical histories of 949 new adult dental patients were examined regarding four non-communicable diseases (NCDs): heart disease, diabetes mellitus, hypertension, and cerebrovascular disease. Additionally, their attendance patterns for regular dental check-ups were examined. Logistic regression analysis was used to determine the influence of four factors - NCDs, gender, age group, and number of present teeth - on dental attendance patterns.

Results: Of 949 new dental patients, 488 (51.4%) were males ranging from 20 years to 80 years or more. As for the number of present teeth at the initial visit, 69.4% of males and 67.1% of females had more than 25 teeth. History of NCDs in males was 17% for hypertension, 10.8% for diabetes mellitus, 6.6% for heart disease, and 1.2% for cerebrovascular disease. In females, 13.4% had a history of hypertension while the prevalence of diabetes mellitus was 3.7%, heart disease was 2.6%, and cerebrovascular disease was 0.4%. As for attendance patterns, females (64.2%) were more likely to receive regular dental check-ups than males (58.2%). There was no significant correlation between NCDs and regular dental check-ups.

Conclusion: These findings indicate that dental professionals should take a common risk factor approach, making a greater effort to provide health information about the bi-directional relationship between oral health and NCDs.

Key words : regular dental check-ups, attendance patterns, non-communicable diseases, common risk factors

Introduction

Regular dental attendance, along with other oral

health behavior, is an essential factor in the prevention of oral disease progression and the maintenance of good oral condition with functional tooth retention. Moreover, there is a bi-directional relationship between systemic and oral diseases. The literature has shown a positive association between periodontal diseases and non-communicable diseases (NCDs) such as diabetes mellitus, respiratory diseases, cardiovascular diseases, and

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adverse pregnancy outcomes¹⁻¹⁰). One report concerning diabetic adults showed that they were less likely to have seen a dentist (65.8%) than to have used health care services for diabetic treatments (86.3%)¹¹. A high incidence of systemic disease throughout a patient's lifetime is likely to act as a barrier to regular dental visitation. It has been shown that poor physical condition was one of the main reasons for failure to keep an appointment and failure to maintain a routine attendance pattern¹²⁻¹⁵.

On the other hand, the risk factors for NCDs include food intake behavior and cigarette smoking, which are also risk factors for oral diseases, as highlighted by Sheiham and Watts in their "common risk factor approach"¹⁶. From the standpoint of a population approach, providing health instruction to patients in a dental setting would be an effective preventive measure.

The purpose of this study was to examine the medical histories of new dental patients as well as their attendance patterns, namely whether or not they received regular dental check-ups after the initial visit.

Methods

The subjects were 949 new adult patients who visited a dental clinic located in Saitama Prefecture during the six-year period from 2005 to 2010. We examined the patients' medical histories regarding four NCDs: heart disease, diabetes mellitus, hypertension, and cerebrovascular disease. Additionally, their attendance patterns were examined and subjects were divided into two groups: those who had seen a dentist for regular dental check-ups more than once and those who had not. Logistic regression analysis was used to determine which factors influenced dental attendance patterns. The following four factors were analyzed: NCDs, gender, age group, and number of

present teeth. SPSS 13.0 J was used for statistical analysis.

Results

Among 949 new dental patients, 488 (51.4%) were males and 461 (48.6%) were females, ranging from 20 years to 80 years or more (Table 1). About a half (42.7%) of the patients occupied two age groups: 50-59 years (19.4%) and 60-69 years (23.3%). As for the number of present teeth at the initial visit, among 484 males, 30.6% had less than 24 teeth and 69.4% had greater or equal 25 teeth. Among 459 females, the percentage who had less than 24 teeth vs. greater or equal 25 teeth was 32.9% and 67.1%, respectively.

Males with histories of NCDs included 17% with hypertension, 10.8% with diabetes mellitus, 6.6% with heart disease, and 1.2% with cerebrovascular disease. Females with histories of NCDs included 13.4% with hypertension, 3.7% with diabetes mellitus, 2.6% with heart disease, and 0.4% with cerebrovascular disease (Table 2).

As for attendance patterns, among 488 males, 58.2% received regular dental check-ups (more than once) and 41.8% did not receive regular check-ups. Among 461 females, 64.2% had routine dental check-ups, and 35.8% did not. Females were more likely to receive regular dental check-ups than males.

As seen in the results of the logistic regression analysis (Table 3), this study did not show NCDs

Table 1 New dental patients, 2005-2010

	Male	Female	Total
20-29 yrs.	77	76	153
30-39 yrs.	96	98	194
40-49 yrs.	50	61	111
50-59 yrs.	94	90	184
60-69 yrs.	132	89	221
70-79 yrs.	33	34	67
80 yrs. +	6	13	19
Total	488	461	949

Table 2 History of non-communicable diseases of new dental patients, based on patient-provided medical histories

		Heart Disease		Diabetes Mellitus		Hypertension		Cerebrovascular Disease	
		n	%	n	%	n	%	n	%
Male	20-29 yrs.	0	0.0	2	2.6	0	0.0	0	0.0
	30-39 yrs.	1	1.1	0	0.0	2	2.2	0	0.0
	40-49 yrs.	1	2.0	3	6.0	2	4.0	0	0.0
	50-59 yrs.	6	6.5	11	11.8	13	14.0	1	1.1
	60-69 yrs.	19	14.4	30	22.7	45	34.1	2	1.5
	70-79 yrs.	2	6.3	5	15.6	19	59.4	3	9.4
	80 yrs. +	3	50.0	1	16.7	1	16.7	0	0.0
Total	32	6.6	52	10.8	82	17.0	6	1.2	
Female	20-29 yrs.	0	0.0	0	0.0	1	1.3	0	0.0
	30-39 yrs.	1	1.0	0	0.0	1	1.0	0	0.0
	40-49 yrs.	1	1.6	0	0.0	0	0.0	0	0.0
	50-59 yrs.	1	1.1	6	6.7	18	20.0	1	1.1
	60-69 yrs.	6	6.9	6	6.9	21	24.1	1	1.1
	70-79 yrs.	3	8.8	2	5.9	16	47.1	0	0.0
	80 yrs. +	0	0.0	3	23.1	4	30.8	0	0.0
Total	12	2.6	17	3.7	61	13.4	2	0.4	

Table3-1 Comparison of regular dental attendants and non-regular dental attendants with NCDs' (Diabetes mellitus) patients under adjusting for confounding factors (gender, age, and tooth number) by the multiple logistic regression analysis

	B	SE	Wald	Df	p	Odds ratio	95% CI	
							Lower Limit	Upper limit
Gender	-0.29	0.14	4.18	1.00	0.04	0.75	0.57	0.99
Age group	0.35	0.05	45.81	1.00	0.00	1.42	1.28	1.57
Tooth number	0.64	0.18	12.82	1.00	0.00	1.89	1.33	2.68
Deabetis Mellitus	-0.14	0.28	0.27	1.00	0.60	0.87	0.50	1.49
constant	-1.34	0.31	18.12	1.00	0.00	0.26		

Gender:1:male, 2:female

Age group:2:20-29yrs, 3:30-39yrs, 4:40-49yrs, 5:50-59yrs, 6:60-69yrs, 7:70-79yrs, 8:>80yrs

Tooth number: 0:<24, 1:≥25

Table3-2 Comparison of regular dental attendants and non-regular dental attendants with NCDs' (Heart disease) patients under adjusting for confounding factors (gender, age, and tooth number) by the multiple logistic regression analysis

	B	SE	Wald	Df	p	Odds ratio	95% CI	
							Lower Limit	Upper limit
Gender	-0.31	0.14	4.80	1.00	0.03	0.74	0.56	0.97
Age group	0.34	0.05	43.70	1.00	0.00	1.41	1.27	1.56
Tooth number	0.65	0.18	13.27	1.00	0.00	1.91	1.35	2.71
Heart diseae	0.28	0.36	0.59	1.00	0.44	1.32	0.65	2.67
constant	-1.31	0.31	17.48	1.00	0.00	0.27		

Gender:1:male, 2:female

Age group:2:20-29yrs, 3:30-39yrs, 4:40-49yrs, 5:50-59yrs, 6:60-69yrs, 7:70-79yrs, 8:>80yrs

Tooth number: 0:<24, 1:≥25

to have an influence on regular dental attendance after adjusting for confounding factors (gender, age, and tooth number).

Discussion

Regular dental check-ups have a positive effect on oral health and on maintaining a functional dentition. It was demonstrated in one study that

Table3-3 Comparison of regular dental attendants and non-regular dental attendants with NCDs' (Hypertension) patients under adjusting for confounding factors (gender, age, and tooth number) by the multiple logistic regression Analysis

	B	SE	Wald	Df	p	Odds ratio	95% CI	
							Lower Limit	Upper limit
Gender	-0.30	0.14	4.56	1.00	0.03	0.74	0.57	0.98
Age group	0.34	0.05	39.71	1.00	0.00	1.41	1.27	1.57
Tooth number	0.64	0.18	13.08	1.00	0.00	1.90	1.34	2.69
Hyper tension	0.03	0.22	0.03	1.00	0.87	1.04	0.67	1.59
constant	-1.32	0.32	17.14	1.00	0.00	0.27		

Gender:1:male, 2:female

Age group:2:20-29yrs, 3:30-39yrs, 4:40-49yrs, 5:50-59yrs, 6:60-69yrs, 7:70-79yrs, 8:>80yrs

Tooth number: 0:<24, 1:>25

Table 3-4 Comparison of regular dental attendants and non-regular dental attendants with history of cerebrovascular disease, adjusting for confounding factors (gender, age, and tooth number) by the multiple logistic regression analysis

	B	SE	Wald	Df	p	Odds ratio	95% CI	
							Lower Limit	Upper limit
Gender	-0.30	0.14	4.69	1.00	0.03	0.74	0.56	0.97
Age group	0.34	0.05	44.57	1.00	0.00	1.41	1.27	1.56
Tooth number	0.64	0.18	13.01	1.00	0.00	1.90	1.34	2.69
Cerebrovascular disease	1.09	1.08	1.03	1.00	0.31	2.99	0.36	24.72
Constant	-1.31	0.31	17.41	1.00	0.00	0.27		

Gender: 1: male, 2: female

Age group: 2: 20-29 yrs., 3: 30-39 yrs., 4: 40-49 yrs., 5: 50-59 yrs., 6: 60-69 yrs., 7: 70-79 yrs., 8: > 80 yrs.

Tooth number: 0: < 24, 1: > 25

among people who visited a dentist only when in trouble, 40.3% had lost their natural functional teeth. On the other hand, of those who visited a dentist for routine dental check-ups, only 20.3% (at least annual attendance) and 19.9% (attendance at least once every two years) had lost their teeth¹⁷⁾. Tooth loss in people with type 2 diabetes was reported to be 15 times higher than in those without diabetes¹¹⁾. Adults with diabetes were less likely to have visited a dental clinic (65.8%) than those without diabetes (73.1%) within the preceding 12 months ($p=0.0000$)¹⁸⁾.

People who receive regular dental check-ups at least once a year were significantly more likely to be younger, female, richer, more educated, non-smokers, and to eat fruits and vegetables at least once a day¹⁷⁾. They were also more likely to have no cost barriers, be dentate, have no perceived symptoms, and have no fear of pain¹⁹⁾. People

with systemic diseases such as diabetes mellitus have a higher risk of oral diseases, compared with those without systemic diseases. If the incidence of oral problems and systemic diseases were a determinant of routine dental visits, individuals who had higher risks of tooth loss such as severe periodontitis or diabetes mellitus would have visited dentists more often, compared with those who have a lower risk of dental problems. The results of this study, however, show that this is not the case. One of the reasons for this may be that individuals with NCDs do not get enough information about the complications of and bi-directional relationships between oral health and systemic diseases from their health care providers.

On the other hand, the percentage of new dental patients in this clinic who have histories of NCDs was found to range from 0.4% to 17%.

These findings indicate that dental professionals

should provide more health information about the relationship between oral health and NCDs in the dental setting. That is to say, a common risk factor approach towards NCDs should be encouraged in the dental field.

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