A Survey of Dental Caries and Periodontal Disease Prevalence in the Students of Kyushu Dental College and School of Dental Hygiene

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Introduction

Surveys of dental diseases were performed on a portion of the students attending Kyushu Dental College and the School of Dental Hygiene, Kyushu Dental College, in 1968¹⁾, 1972²⁾ and 1974³⁾. The present survey was conducted on all students to compare the prevalence of dental diseases between the present and past (20 years ago) students. It was also conducted to determine the changes in the student's recognition of dental disease prevention, with the present college curriculum, by examining the condition or treatment needs of their dental diseases.

Materials and Methods

In May 1987, a survey was made of the dental caries and periodontal disease prevalence in 768 of 805 (95.4%) students, (511 males and 257 females), from Kyushu Dental College (abbreviated to college students) and the School of Dental Hygiene, Kyushu Dental College (hygiene school students). The survey utilized the DMF index for permanent teeth, and the Community Periodontal Index of Treatment Needs (CPITN)⁴⁾. Examinations were carried out in a college room, with sufficient illumination, provided by artificial light. Dental mirrors, explorers and WHO periodontal examination probes (Yamaura Seisakusho Ltd.) were used. The criteria used for the diagnosis of dental caries, were those recommended by the WHO⁵⁾. Decayed, filled and sound teeth were scored according to the WHO guidelines. Missing teeth were presumed to have been extracted. Seven examiners assessed the periodontal status according to the examination method of index teeth by Ainamo, *et al.*⁴⁾ The data were analyzed using an NEC Personal Computer PC-9801/F2.

Results

Table 1 shows the mean age of the subjects and the mean number of DMF teeth in the students according to the college year. The mean number of DMF teeth was 8.99 in the 1st-year students, and gradually increased with successive years, reaching 11.31 in the 6th-year students. The mean number of DMF teeth in the 1st- and 2nd-year hygiene school students was about two more than that in the 1st-year college students who were of similar age. For the students in each college year, the mean number of decayed and missing teeth due to dental caries was under 1.41. Most of the DMF teeth were filled. The percentage of decayed teeth, per DMF tooth, was 9.8% in the 1st-year students. The percentage increased with each successive year, and reached a maximum percentage (14.0%) in the 3rd-year students. However, the percentage decreased from the 4th- to 6th-year students, and reached a minimum percentage (3.2%) in the 6th-year students.

Concerning the periodontal disease prevalence by age group, the data obtained from the 30- to 44-year-old students, are shown in the tables together, as only a few subjects were examined.

Table 2 shows the percentage of students showing some signs of periodontal disease, according to age and sex, using the WHO guidelines (the rate of those giving the most severe symptomatic grade). In 18- and 19-year-old students, 90% of the males and 82% of the females showed some signs of periodontal diseases. Supra- or subgingival calculus (Code 2) was observed in 72–78% of the 18- to 29-year-old students. Pathologic pockets 4 or 5 mm deep (Shallow pockets; Code 3) were observed in 6–8% of the 18- to 29-year-old students, and pathologic pockets 6 mm or deeper (Deep pockets; Code 4)

Table 1 Mean age and mean number of DMF teeth in college students by year

Year	N	Age	DMF	D	M	F
1st	120	19.90 (2.73)	8.99 (4.88)	0.88 (1.59)	0.05 (0.21)	8.06 (5.09)
2nd	100	21.09 (3.27)	9.18 (4.65)	1.12 (1.79)	0.08 (0.31)	7.98 (4.47)
3rd	117	21.68 (2.42)	10.10 (5.15)	1.41 (1.89)	0.19 (0.56)	8.50 (5.16)
4th	117	23.21 (3.05)	10.23 (4.84)	0.98 (1.59)	0.31 (0.79)	8.94 (4.66)
5th	128	23.80 (2.48)	11.01 (5.06)	0.97 (1.85)	0.53 (1.32)	9.51 (5.12)
6th	108	24.49 (2.73)	11.31 (5.53)	0.36 (0.78)	0.36 (0.78)	10.59 (5.45)
1st (DH)	40	18.33 (0.47)	10.71 (4.51)	0.58 (1.32)	0.03 (0.16)	10.10 (4.37)
2nd (DH)	38	19.24 (0.59)	11.68 (5.37)	0.47 (1.11)	0.18 (0.69)	11.03 (5.27)

DH : School of Dental Hygiene

() : s.d.

Table 2 Percentage of students showing signs of periodontal disease by age group and sex (N=768)

	Age	N	No periodontal disease	Bleeding only	Calculus	Shallow pockets	Deep pockets
Males	18—19	68	10	10	72	7	0
	20—29	415	7	5	78	8	1
	30—44	28	4	0	79	14	4
Females	18—19	108	18	6	70	6	0
	20—29	144	13	6	76	6	0
	30—44	5	20	0	60	0	20
Total	18—19	176	15	8	71	6	0
	20—29	559	8	5	78	8	1
	30—44	33	6	0	76	12	6

Table 3 Percentage of students showing signs of periodontal disease by year (N=768)

Year	N	No periodontal disease	Bleeding only	Calculus	Shallow pockets	Deep pockets
1st	120	6	4	81	8	1
2nd	100	7	9	79	5	0
3rd	117	4	5	77	12	2
4th	117	8	1	82	9	0
5th	128	8	9	74	9	1
6th	108	15	7	71	5	2
1st (DH)	40	20	3	73	5	0
2nd (DH)	38	34	8	58	0	0

DH : School of Dental Hygiene

were observed in 1% of the 20- to 29-year-old males. The percentage of students affected increased with age, and tended to be higher in the males than in the females.

The percentage of students having no periodontal disease (Code 0), including gingival bleeding after gentle probing (Code 1), supra- or subgingival calculus and pathologic pockets, was similar between the 1st- and 5th-year college students. However, the percentage of students showing a healthy periodontal status was higher in the 6th-year college students and the hygiene school students than in the 1st- to 5th-year college students (Table 3).

The mean number of sextants affected was similar among age groups; however, more males than females were affected (Table 4). The mean number of sextants affected was similar between the 1st- and 4th-year college students. In the 6th-year college students and the 1st- and 2nd-year hygiene school students, the number of sextants affected was less than in the 1st- to 4th-year college students (Table 5).

Table 4 Mean number of sextants affected by age group and sex

	Age	N	Bleeding only	Calculus	Shallow pockets	Deep pockets
Males	18—19	68	3.4	2.3	0.1	0.0
	20—29	415	3.3	2.5	0.1	0.0
	30—44	28	3.8	2.7	0.3	0.1
Females	18—19	108	2.4	1.7	0.1	0.0
	20—29	144	2.7	2.0	0.1	0.0
	30—44	5	3.2	2.6	0.2	0.2
Total	18—19	176	2.8	2.0	0.1	0.0
	20—29	559	3.2	2.4	0.1	0.0
	30—44	33	3.7	2.7	0.3	0.1

Table 5 Mean number of sextants affected by year

Year	N	Bleeding only	Calculus	Shallow pockets	Deep pockets
1st	120	3.4	2.5	0.1	0.0
2nd	100	3.4	2.2	0.1	0.0
3rd	117	3.8	2.7	0.3	0.0
4th	117	3.4	2.7	0.1	0.0
5th	128	2.8	2.3	0.1	0.0
6th	108	2.5	1.8	0.1	0.0
1st (DH)	40	2.3	1.8	0.1	0.0
2nd (DH)	38	1.5	1.2	0.0	0.0

DH : School of Dental Hygiene

Table 6 Service requirements by age group and sex (%)

	Age	N	Hygiene instruction	Prophylaxis	Complex treatment
Males	18—19	68	90	79 (2)	0 (0)
	20—29	415	93	88 (3)	1 (0)
	30—44	28	96	96 (3)	4 (0)
Females	18—19	108	82	76 (2)	0 (0)
	20—29	144	88	82 (2)	0 (0)
	30—44	5	80	80 (3)	20 (0)
Total	18—19	176	85	77 (2)	0 (0)
	20—29	559	92	86 (2)	1 (0)
	30—44	33	94	94 (3)	6 (0)

() : Mean number of sextants affected

Table 7 Service requirements by year (%)

Year	N	Hygiene instruction	Prophylaxis	Complex treatment
1st	120	94	90 (3)	1 (0)
2nd	100	93	84 (2)	0 (0)
3rd	117	96	91 (3)	2 (0)
4th	117	92	91 (3)	0 (0)
5th	128	92	84 (2)	1 (0)
6th	108	85	78 (2)	2 (0)
1st (DH)	40	80	78 (2)	0 (0)
2nd (DH)	38	66	58 (1)	0 (0)

DH : School of Dental Hygiene

() : Mean number of sextants affected

Eighty-five percent of the 18- and 19-year-old students, and 92% of the 20- to 29-year-old students, were diagnosed as requiring oral hygiene instruction. Seventy-seven percent of the 18- and 19-year-old students and 86% of the 20- to 29-year-old students were diagnosed as requiring oral prophylaxis (Table 6). The number of 2nd-year hygiene school students, requiring periodontal services was lower than that in any other year. A small percentage of college students were diagnosed as requiring complex treatment. Over 90% of the students between the 1st- and 5th-year were diagnosed as requiring oral hygiene instruction (Table 7).

Discussion

In the 1967 survey, the mean number of DMF teeth in the college students (21.8 years of age) and the hygiene school students (18.7 years of age) was 5.05 and 6.20, respectively¹⁾. In 1972, this figure increased to 8.23 in the college students (23.0 years of age)²⁾, and in 1974, it increased to 10.08 in the hygiene school students (19.0 years of age)³⁾. In the present study, the mean number of DMF teeth further increased to twice that observed 20 years ago. Such an increase in the prevalence of dental caries in college students reflects the changes in the general Japanese population. The mean number of DMF teeth in the college students was one to two less than that in the general Japanese population, described in the 1981 report of the survey of dental diseases⁶⁾. They cannot be compared directly, however, as there was a time lag of six years. Further, the percentage of filled teeth per DMF tooth was higher in the college students than in the general Japanese population⁶⁾. These results indicate that the level of recognition of dental caries is higher among the college students. In the assessment of the percentage of decayed (untreated) teeth per DMF tooth, by college year, a gradual increase, from 9.8% in the 1st- year to 14.0% in the 3rd-year, was noted. However, it was depressed in the 4th-year and reached its lowest value of 3.2% in the 6th-year (these data are not shown in the table). It is suspected that these results may

be closely related to the curriculums for lectures and practices, in the dental college.

On the other hand, the periodontal status was not impressive, and a similar condition existed between the college students over 20 years of age and those⁷⁻¹²⁾ of the same age who were not related to dentistry. However, female students under 20 years of age (hygiene school students) maintained a better periodontal status than the general population⁷⁻¹²⁾ of the same age. The periodontal disease prevalence by college year shows that the 6th-year students and hygiene school students maintained much better periodontal health than college students in other years. These results may reflect the motivation for periodontal disease prevention in hygiene school students. The results may also be explained by the younger age of the hygiene students and the fact that they receive lectures and training for dental disease prevention in their 1st year. This can also explain the results of the 6th-year college students. Briefly, the depressed prevalence of periodontal diseases in this group may be ascribable to the practice of tooth brushing for three weeks in the 5th-year, and the oral hygiene instruction for out-patients of the college hospital and the scaling practice among students in the 5th- and 6th-year.

All students who want to be dentists should have good oral health. As they move up to the professional course (3rd-year) and begin to receive lectures on dentistry, they become much more interested in dental diseases. As a result, the percentage of filled teeth, per decayed tooth which can be diagnosed easily by themselves, will be elevated in the 4th-year. However, students receiving lectures on periodontology or preventive dentistry are not able to determine the presence or degree of disease in their periodontal status through only their knowledge. Even if they are able to consider it, they are not able to take appropriate countermeasures. For these reasons, the recovery of periodontal health may be delayed for two years (in the 6th-year) than treatment of decayed teeth.

As shown by the results of the survey on the hygiene school students, periodontal health can be easily maintained by learning about preventive dentistry, and mutual scaling practice (their scaling technique is not yet skilled) for one year. The extremely high prevalence of periodontal diseases in the 1st- to 5th-year college students presents a problem in the future planning of curriculums for the dental college. It is necessary to take measures, including the incorporation of lectures on preventive dentistry in lower college years and the introduction of scaling practice, in order that dental students will be able to manage their own dental health.

Summary

In May 1987, a survey was carried out to determine the prevalence of dental caries and periodontal disease in 768 of the 805 (95.4%) students of Kyushu Dental College and the School of Dental Hygiene. The aim of this survey was to grasp the changes in dental diseases between college students in 1967 and those in 1987, and to determine their recognition for the prevention of dental diseases. The mean number of DMF teeth

and the percentage of decayed teeth per DMF tooth were lower in the students than in the general Japanese population. The mean number of DMF teeth, however, was twice as many in the present students as in the students of 20 years ago. The mean number of DMF teeth was 8.99 in the 1st-year students and gradually increased with the year, reaching 11.31 in the 6th-year students. The percentage of decayed teeth per DMF tooth increased with the year and reached a maximum percentage (14.0%) in the 3rd-year students. Conversely, the percentage decreased with the year from the 4th- to 6th-year, and reached a minimum percentage (3.2%) in the 6th-year students. While the percentage of students showing some signs of periodontal disease was similar between the 1st- and 5th-year students, the percentage was also similar between these groups and the other populations. However, the 6th-year students of the college and the students of the school of dental hygiene had healthy periodontal status. These findings revealed that the college students' recognition for periodontal disease prevention differed from dental caries prevention and was lacking until they were promoted to the 6th-year.

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九州歯科大学および附属歯科衛生学院学生の 歯科疾患実態調査

九州歯科大学口腔衛生学講座（主任：竹原直道教授）

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1987年5月に、九州歯科大学および附属歯科衛生学院学生768名（受診率95%）を対象として、齲蝕と歯周疾患の実態調査を行なった。この調査の目的は、20年前の本学学生と比較して現在の学生の歯科疾患有病に、どのような変動があるかを知ることと、現学生の歯科疾患の処置状況、或いは処置の必要性を通して、歯科疾患予防に対する彼らの認識を推察し、歯科専門講義のカリキュラムによる彼らの認識の変化を把握することであった。

齲蝕有病を DMF 歯数でみると、進1の9.0本から学年の上昇に伴って増加し、学4では11.3本であった。衛生学院生は同年代である進1に比べて約2本多かった。これらの値を20年前の本学学生の報告値と比較するとはほぼ2倍に増加していた。しかしながら、この増加傾向は日本人全般の齲蝕有病状態の変貌が本学学生に反映している結果にすぎず、日本全国レベルからすると、本学学生の DMF 歯数は若干少ない状況にある。これが処置歯率、或いは未処置率でみると、本学学生は極めて優れた結果を示しており、齲蝕に関する限りでは、本学学生の認識の高さを伺うことができる。表には示していないが、齲蝕の未処置歯率を学年別にみると、進1の9.8%から高学年になるほど高率化し、学1で14.0%とピークに達した。学2以降ではこの率は次第に低下し、学4で最低の3.2%となった。この結果は本学の歯科専門講義、実習のカリキュラムと極めて密接な関係が示唆されているように思える。

一方、歯周疾患有病では、歯周疾患の徴候がみられない者（Code 0）、歯肉出血のある者（Code 1）、歯石沈着のみられる者（Code 2）、4 mm 以上の歯周ポケットを有する者（Code 3, Code 4）ともに、進1から学3まで大差はなかった。それに対して、学4と衛生学院生

は他の学年に比べて健康な歯周組織を有する者の割合が高かった。有病部位数でみても同様の傾向が示された。また、これらの調査結果は、歯科分野と無関係な同年代の者と比較して、進1から学3までの学生は歯周組織が健康であるとは言い難いことを示していた。しかしながら、衛生学院生と学4の学生は、同世代の一般市民より高い健康レベルにあった。衛生学院では歯科疾患予防に関する講義や実習がメインであるから、学院生は年齢が若いのに加えて、歯周疾患予防に対するモチベーションがなされている結果が現われているのであろう。学4の学生にも同様のことが言える。つまり、学3の口腔衛生実習で、3週にわたってブラッシング実習を行なったこと、学3の終わり頃からの登院で、患者に対する口腔衛生指導に接しだしたことなどが歯周組織の健康回復につながってきたものと思われる。

少なくとも、本学学生は自分の口腔内の健康を望まぬ者はいないはずであるし、学部に進学し、歯科学の講義が始まると一層歯科疾患に対する関心は高まってくるものである。その結果、自己診断が行ないやすい齲蝕では、その処置率は学2に進級した頃から高くなっていくのであろう。しかしながら、歯周疾患に関しては登院するまでその回復はみられない。講義を受けた専門知識だけでは、自分の歯周の健康状態は把握できないのか、或いは、自覚はあってもその対処の具体的方法がわからないのかも知れない。衛生学院生の調査結果に示されているように、1年間の予防歯科の学習と相互除石実習—完全な除石を行なえるだけの実力はまだない—のみで、歯周組織の健康回復・保持は容易にはかれるのである。その点を考えると、学3までの歯周疾患の極めて高い有病状況は、今後の大学の課題として問題を提起している。