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Original Article

Effectiveness of Dental Checkups Incorporating Tooth Brushing Instruction

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Abstract

The purpose of this study was to compare the effectiveness of dental checkups incorporating tooth-brushing instruction (TBI) with that of conventional dental checkups. A team consisting of one dentist and three dental hygienists saw an average of 60 employees per day on-site at an airline company. The patient's teeth were stained with a disclosing tablet and the results recorded on a Plaque Control Record (PCR) chart. The patient was then given TBI. After recording the relevant data, including TBI given and PCR scores, the charts were stored. Checkups were performed in a total of 3,854 patients between 2001 and 2005 and changes in annual scores investigated. In addition, annual shifts in mean score in patients receiving checkups over all five years were compared with those in patients receiving checkups for the first time in each of the five years. The mean score in patients receiving a checkup in 2001 was 35.1%, declining by 2.6 points to 32.5% in 2005. Among patients receiving checkups over all five years, the mean score in 2001 was 34.0%, declining by 11.2 points to 22.8% in 2005. Over the five-year period, the mean score in patients receiving checkups was 34.1%. In patients receiving checkups over all five years, the proportion with PCR scores <30% increased each year. This was because the number of patients with PCR scores $\geq 60\%$ decreased each year. These findings suggest that TBI is effective in reducing poor plaque control. When compared with in patients who had not received TBI, five consecutive years of checkups was clearly effective. These results indicate that checkups incorporating TBI are more effective than

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conventional dental checkups that simply check for caries. In future, this type of checkup should contribute to improved preventative dentistry with minimal intervention.

Key words: Dental checkups—TBI—PCR—Community periodontal index—Preventative dentistry

Introduction

Regular dental checkups which included monitoring for caries, periodontal disease, occlusal problems, and temporomandibular disorders would help maintain the oral health of the general population. Schoolchildren of all age groups receive dental checkups under the School Health Law. Implementation in the adult population, however, is less consistent and depends on the level of awareness in the workplace.

In recent years, however, increased public awareness of preventive dentistry together with its role in general health has resulted in zealous implementation of oral health checkups by an increasing number of companies^{1-3,6)}.

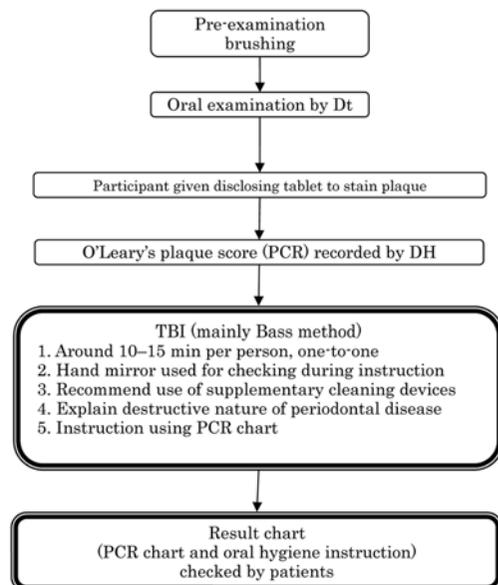
At the request of a health insurance group associated with an airline company, we carried out oral health screening as part of a unique health program that included preventive dentistry as part of its general health concept, with the aim of improving the employees' awareness and oral hygiene practices.

The purpose of this study was to compare the effectiveness of dental checkups incorporating tooth-brushing instruction (TBI) with that of conventional dental checkups by investigating their implementation at a single company over five consecutive years.

Materials and Methods

The team consisting of one dentist and three dental hygienists examined an average of 60 employees per day. First, the patient was required to complete a medical history questionnaire. The patient was then given regular dental checkups by a dentist and the Community Periodontal Index score⁴⁾ recorded. After

the patient had brushed their teeth, oral hygiene instruction was provided by the method shown in Fig. 1. Initially, each patient was given a disclosing tablet and instructed to chew it. After the teeth were stained, one of the dental hygienists filled in a Plaque Control Record (PCR) chart⁵⁾ and TBI was given (mainly the Bass method) depending on the patient's oral condition. The time allotted for TBI was between 10 and 15 min per patient, and a hand mirror was used for checking according to the standard method. The use of auxiliary cleaning devices such as interdental brushes and dental floss was recommended in patients with malaligned teeth, isolated teeth, or exposed furcation, and a brief explanation



* Follow-up sessions for patients with poor plaque control

Fig. 1 Checkup method: 60 patients seen on average each day by one dentist (Dt) and three dental hygienists (DH)

regarding periodontal disease was also given. After recording data on TBI and PCR scores, the charts were stored. A copy of their chart was given to each patient so that they could check their own details and dental hygiene instructions.

Follow-up sessions were held for patients with PCR scores $\geq 60\%$, to motivate them towards improving their oral hygiene. This study was approved by the Ethics Committee of Tokyo Dental College (approval no. 287).

Results

Table 1 and Fig. 2 show the numbers of patients receiving checkups each year, as well as the percentages of patients receiving checkups for the first time in each of the five years and those who received checkups

over all five years. A cumulative total of 3,854 patients received checkups over the five-year period, of which 284 received checkups every year. Figure 3 shows changes in PCR scores in patients receiving checkups for the first time in each of the five years and in those received checkups over all five years. There were no major changes in PCR score among those who received checkups for the first time each year, but the scores for those who received checkups over all five years decreased year-on-year. Scores in the fourth and fifth years, in particular, tended to decline significantly. According to O'Leary's plaque index, a score of $\leq 10\%$ is regarded as good, but as this study concerned mass instruction we categorized scores of $< 30\%$ as good, $\geq 30\%$ but $< 60\%$ as moderate, and $\geq 60\%$ as poor plaque control. Based on these results, the PCR score distribution obtained is shown in Figs. 4-1 to 4-3.

Table 1 Number of patients

Year		2001	2002	2003	2004	2005
Total number of patients		781	676	819	774	804
First-time patients	Number	781	165	188	119	121
	Percentage		24.4%	23.0%	15.4%	15.0%
Patients receiving checkups over all five years	Number	284	284	284	284	284
	Percentage		42.0%	34.7%	36.7%	35.3%
Other*	Number	0	227	347	371	399
	Percentage		33.6%	42.4%	47.9%	49.6%

* "Other" refers to patients who were neither first-time patients nor patients receiving checkups over all five years. As program was initiated in 2001, all patients were taking part for first time that year and there was no "other".

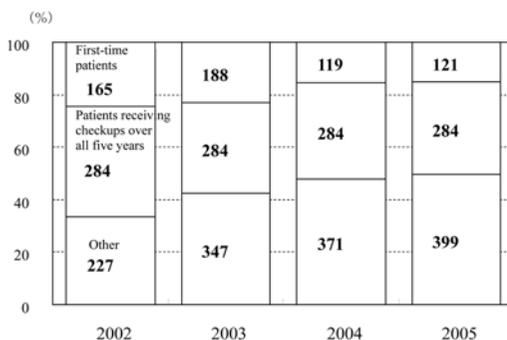
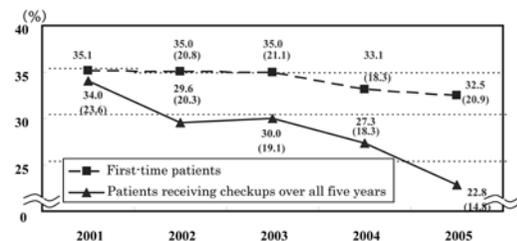
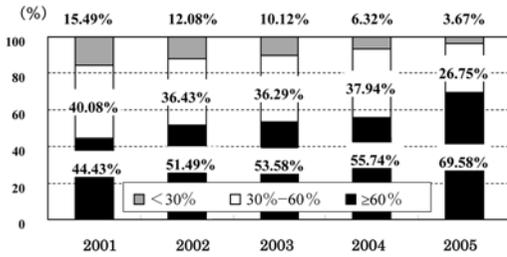


Fig. 2 Numbers and percentages of first-time patients, patients receiving checkups over all five years, and other

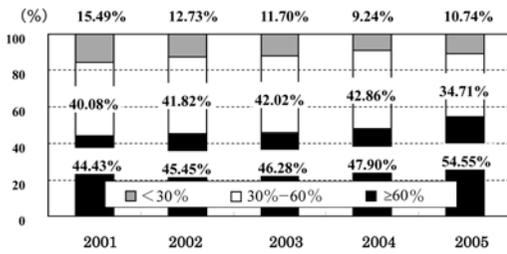


Note: Figures in brackets are standard deviations.

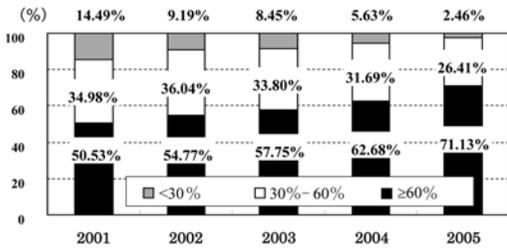
Fig. 3 Comparison of mean PCR scores (2001–2005)



4-1 All patients

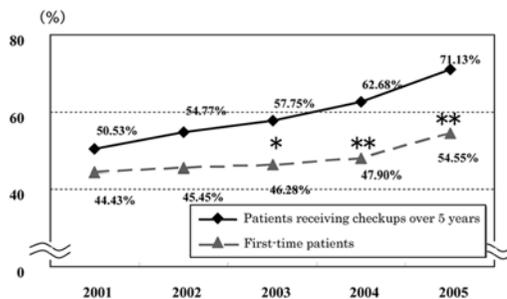


4-2 First-time patients



4-3 Patients receiving checkups over all five years

Fig. 4 PCR score distribution



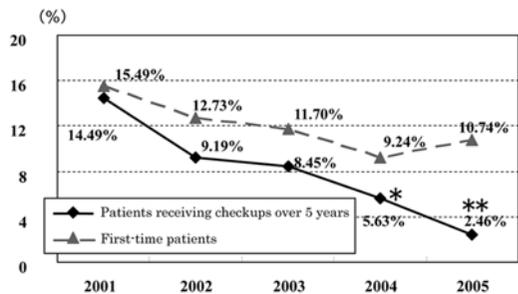
5-1 Changes in percentage of patients with good plaque control scoring <30%

Figures 5-1 and 5-2 show changes in the mean PCR scores in patients who received checkups over all five years and those who received a checkup for the first time each year.

Discussion

In this study, we investigated the effectiveness of checkups incorporating TBI carried out on-site at a single company over five consecutive years.

We found that not only did the PCR scores of those patients who received checkups over all five years, who accounted for approximately 37% of the total number of patients, decrease year-on-year, but also that the number of patients who scored <30% and were judged to have good plaque control increased year-on-year. By the fifth year, around 70% of patients who had received checkups over all five years fell into this category. This confirmed that regular checkups over a five-year period yielded better results than checkups carried out over a three-year period⁽⁶⁾. The mean PCR score in patients receiving their first checkup was 34%, and when subsequent results each year were compared with those in patients receiving checkups over all five years, it was clear whether or not they had followed the TBI. We conjectured that implementation of one-to-one instruction depending on the patient's oral environment had



5-2 Changes in percentage of patients with poor plaque control scoring ≥60%

Fig. 5 Changes in percentage of patients with good or poor

improved tooth-brushing technique. Among patients receiving checkups over all five years, the proportion with PCR scores <30%, indicating good plaque control, increased each year, while the proportion with PCR scores³⁾ 60%, indicating poor plaque control, decreased each year, with a significant difference between this group and patients receiving their first checkup in the fourth or fifth years. This indicated that the effectiveness of this checkup program improved with increase in the number of years and that it raised the level of oral health awareness among the patients who participated.

The follow-up sessions for patients with poor plaque control who scored $\geq 60\%$ were intended to motivate them, leading directly to improved results.

These findings indicate that incorporation of TBI into conventional dental checkups significantly improves oral health.

This type of checkup would also contribute to improved preventive dentistry with minimal intervention.

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