

Incremental Oral Care System of College Students Changes in Plaque Hydrogen Ion Concentration and Halitosis

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Objective: The purpose of Incremental Dental Care System is to increase the oral health of the whole people by commercializing Incremental Dental Care System in clinical practice by comparing hydrogen ion concentration, probe depth, and bad breath change.

Methods: From March 2019 to September 2019, we compared the change in plaque hydrogen ion concentration, probe depth, and bad breath before and after the Incremental Dental Care System for the medical records of the subjects who visited the oral health promotion room of Honam University.

Results: There was a significant difference in plaque hydrogen ion concentration, probe depth, and bad breath before and after dental hygiene control in the corresponding sample t-test.

Conclusion: F statistic value for mean difference was 1075.726, significance level was 0.000 and at significance level 0.05, plaque hydrogen ion concentration, probe depth, and halitosis according to Incremental Dental Care System were significantly different.

Keywords: Incremental Dental Care System, plaque hydrogen concentration test, scaling, panoramic exam, tooth coloring and brushing, probe depth

Introduction

The dental hygiene process of care is a standard of dental hygienist training that provides professional care to patients [1]. Dental hygienists collect, analyze “and” interpret patient data to establish dental hygiene diagnosis and intervention

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plans and conduct interventions and provide behavioral management and preventive oral health care for oral health prevention and health promotion to the patient through an ongoing process of evaluation and evaluation [2-4].

The purpose of the dental hygiene process is to identify the actual oral health problems and causes of the subjects within the scope of dental hygienist work. (Oral application), fluoride application, scaling, scaling, caries activity test, phase contrast microscopy, specialist interdental, panoramic examination, tooth coloring and toothbrush, and other preventive and medical procedures [5]. Dental hygiene interventions provided by dental hygienists refer to treatment and care provided

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to the subject through prevention, treatment, and education, including primary oral health care services and behavior management [6]. The Incremental Dental Care System should be designed to prevent oral disease from occurring and to treat the oral disease that has already occurred as early as possible. In this study, we compared the change of plaque hydrogen ion concentration, probe depth, and bad breath through dental hygiene management or continuous oral care, and carried out this study in order to promote oral health of the whole nation by commercializing Incremental Dental Care System in clinical practice. The dental hygienist emphasizes that the subject himself/herself is aware of the subject of oral health care and instructs each person to do their knowledge and methods so that they can do oral health care more effectively and actively.

Materials and Methods

1. Study subjects

A total of 160 university students and practitioners who visited the oral health promotion room of Honam University in Gwangju city were randomly sampled and 100 students who agreed to participate in the research were selected. From March 2019 to September 2019, the medical records collected from the department of dental hygiene were taken. The medical records of this study were written by 80 people in the 3rd and 4th grade during the practice time. Clinical dental hygienist training course was conducted for dental hygienist course. According to the guidelines, the plaintiff was approved by the Institutional Review Board (1041223-201904-HR-02) of Honam University.

2. Experimental method

In this study, probe depth, halitosis measurement, and plaque ion concentration test were compared in an Incremental Dental Care System.

3. Measurement items and methods

1) Probe depth

The patient's condition can be assessed by measuring the depth of the gingival opening or the periodontal pouch. The strong fissure is less than 3 mm and there is no bleeding and no gingivitis. Four millimeters or more, hemorrhage, inflammation and gingivitis if the findings are more than 6 mm bleeding, inflammation, alveolar bone absorption is judged to be periodontal disease.

2) Bad breath test

To measure the change of bad breath before and after the

clinical Incremental Dental Care system the voluntary sulphide gas analyzer B&B Checker (mBA-21; Plustech, Daejeon, Korea). After collecting the gas in the oral cavity, the measurement sense was inserted into the mouth and measured for 15 seconds with the breath stopped. The measurement results were expressed in oral gas values. 1-10 no smell at all. 10-30 do not feel the smell and 30-40 almost never feel. I feel a smell more than 40 faintly. Sixty or more smells something. I feel relatively smell more than 80. Sometimes I feel a distinct smell. I feel strong smell more than 100.

3) Plaque hydrogen ion concentration test

When the mouth is wiped with 10% glucose solution, the pH of the oral bacteria membrane can be lowered. The sensitivity of dental caries is increased as oral pH increases. Since the pH of the bacterial membrane inside the oral cavity may be lowered when weighed with glucose solution, the susceptibility to dental caries can be determined by measuring the hydrogen ion concentration of the dental caries membrane after washing the oral cavity with 10%. Plaque are collected from the area where the dental caries lesion is located with a probe and a calculus removal tool. Three kinds of indicators (bromocresol green [BCG], bromocresol purple [BCP], bromthymol blue [BTB]) are dropped one by one using a pipette. Determine the hydrogen ion concentration of the tooth surface bacteria in comparison with the pH determination reference color. Rinse mouth with 10% glucose solution for 2 minutes. Acquire the dentine bacterial membrane at the adjacent site of the initially selected tooth. The collected dentine bacterial membrane is divided into three equal parts on a slide glass. Three different indicators (BCG, BCP, and BTB) are applied to the dentine bacterial membranes distributed in triplicate using a pipette. Confirm the hydrogen ion concentration in the tooth surface of the tooth surface in comparison with the color of the pH determination reference. Repeat for 30 minutes at 5-minute intervals to evaluate the time at which the hydrogen ion concentration in the dentine bacterial membrane coincides with that before washing with glucose. The judgment and prescription is that the pH of the dental caries membrane of a person who is highly susceptible to dental caries is definitely lower than the pH of the saliva, and dental caries develop well when the pH of the dental caries membrane is kept low for more than 30 minutes. If the rate of acid formation is fast and the acid is retained for a long period of time, dental caries occurs well. Limit the food of fermentable carbohydrates, brush thoroughly immediately after ingesting food, and strictly regulate the intake of snacks containing sugars.

4) Dental hygiene practice

Dental hygienist practice includes the use of a sealant, a fluoride coating, a scaling, a caries activity test, a phase contrast microscope, a professional interdental cleansing physiotherapy, a panoramic test, a tooth coloring and brushing lesson, and other preventive and therapeutic procedures.

4. Data analysis

IBM SPSS Statistics for Windows program (ver. 21.0; IBM Corp., Armonk, NY, USA) was used to determine the mean and standard deviation for each variance. In this study, the descriptive statistics in the dental health practice plaque hydrogen ion concentration test, probe depth, and halitosis test in black, the average and standard deviation and the corresponding sample t-test to validate the plaque hydrogen ion concentration test in dental health practice, probe depth, and black bad breath test the correlation analysis and ANOVA.

Results

According to descriptive statistics, plaque hydrogen ion concentration average 1.4800 ± 0.50212 before dental hygiene

management, plaque hydrogen ion concentration average 1.4400 ± 0.51874 after dental hygiene management, probe depth average 1.1100 ± 0.31447 before dental hygiene management, the probe depth average is 1.0300 ± 0.17145 , the average of oral hygiene control 35.0400 ± 9.68277 , and the average of oral hygiene after management 29.1000 ± 8.43933 (Table 1).

The plaque hydrogen ion concentration in correspondence 1 is plaque hydrogen ion concentration average 0.68000 ± 0.60101 before and after dental hygiene management. The statistical significance of differences in plaque hydrogen ion concentrations before and after dental hygiene control was analyzed. The t statistic value was 11.314 and the significance level was 0.000, meaning that the plaque hydrogen ion concentration was significantly different before and after dental hygiene management.

In response 2, the average of probe depth before and after dental hygiene management was 0.08000 ± 0.27266 . The statistical significance of the difference in probe depth before and after dental hygiene management was tested. The t statistic value was 2.934 and the significance was 0.004. The probe depth was found to be significantly different.

In response 3, the mean odor before and after dental hygiene control was 5.94000 ± 9.80087 . The statistical significance of bad breath before and after dental hygiene control test was 6.061, significance was 0.000 and significance level was 0.05. There was a difference (Table 2).

The correlation coefficient of dental hygiene management is 0.626 before and after the bacterial membrane pH value, and the significance probability is 0.000. The prevalence of 0.206 significance is 0.040 and the odds of 0.422 significance after bad breath is 0.000. Therefore, correlation coefficient is significant at 0.01 level (Table 3).

There was a significant difference in plaque hydrogen ion concentration, probe depth, and halitosis according to dental

Table 1. Technical statistics

	Mean	Standard deviation	N
Incremental oral care	1.4800	0.50212	100
Plaque hydrogen ion concentration before	2.1200	0.76910	100
Plaque hydrogen ion concentration after	1.4400	0.51874	100
Probe depth before	1.1100	0.31447	100
Probe depth after	1.0300	0.17145	100
Bad breath before	35.0400	9.68277	100
Bad breath after	29.1000	8.43933	100

Table 2. Corresponding sample of Incremental Dental Care System t-test

Corresponding sample t-test	Corresponding difference						t	df	p (both sides)
	Mean	Standard deviation	Standard error of the mean	95% confidence interval of the standard error difference of the mean					
				Lower limit	Upper limit				
Correspondence 1 Hydrogen ion concentration before and after	0.68000	0.60101	0.06010	0.56075	0.79925	11.314	99	0.000	
Correspondence 2 Probe depth before and after	0.08000	0.27266	0.02727	0.02590	0.13410	2.934	99	0.004	
Correspondence 3 Bad breath Before and after	5.94000	9.80087	0.98009	3.99530	7.88470	6.061	99	0.000	

Table 3. Correlation analysis of Incremental Dental Care System

Correlation coefficient		Before hydrogen ion concentration	After hydrogen ion concentration	Probe depth before	Probe depth after	Bad breath before	Bad breath after	Incremental Dental Care System
Before hydrogen ion concentration	Pearson correlation coefficient	1	0.626**	0.112	0.126	-0.102	-0.039	0.006
	p (both sides)		0.000	0.268	0.213	0.311	0.698	0.951
	N	100	100	100	100	100	100	100
After hydrogen ion concentration	Pearson correlation coefficient	0.626**	1	0.010	0.191	0.025	0.041	0.150
	p (both sides)	0.000		0.922	0.057	0.808	0.688	0.135
	N	100	100	100	100	100	100	100
Probe depth before	Pearson correlation coefficient	0.112	0.010	1	0.500**	0.111	0.213*	0.110
	p (both sides)	0.268	0.922		0.000	0.270	0.034	0.276
	N	100	100	100	100	100	100	100
Probe depth after	Pearson correlation coefficient	0.126	0.191	0.500**	1	0.206*	0.242*	0.183
	p (both sides)	0.213	0.057	0.000		0.040	0.015	0.068
	N	100	100	100	100	100	100	100
Bad breath before	Pearson correlation coefficient	-0.102	0.025	0.111	0.206*	1	0.422**	0.015
	p (both sides)	0.311	0.808	0.270	0.040		0.000	0.885
	N	100	100	100	100	100	100	100
Bad breath after	Pearson correlation coefficient	-0.039	0.041	0.213*	0.242*	0.422**	1	-0.014
	p (both sides)	0.698	0.688	0.034	0.015	0.000		0.891
	N	100	100	100	100	100	100	100
Incremental Dental Care System	Pearson correlation coefficient	0.006	0.150	0.110	0.183	0.015	-0.014	1
	p (both sides)	0.951	0.135	0.276	0.068	0.885	0.891	
	N	100	100	100	100	100	100	100

*The correlation coefficient is 0.05 level (both sides). **The correlation coefficient is at 0.01 level (both sides).

Table 4. Analysis of variance of Incremental Dental Care System

	R ²	df	Mean squared	F	p
Group-liver	57905.928	3	19301.976	1075.726	0.000
Group-within	7105.510	396	17.943		
Sum	65011.438	399			

hygiene management at the significance level of 0.05 (Table 4).

Discussion

In recent medical science, it has been pointed out that the contents of school education are distant from the knowledge, skills and attitudes required in actual society. Therefore, it is necessary to have experience in solving the problems including the actual situations in which school education and social reality can be linked. The need for education that can flexibly cope with actual situations has been raised [7].

The purpose of the dental hygienist's education is to educate professionals as oral health educators, preventive care workers, dental care partners, disease and clinic managers, and to contribute to the improvement of people's oral health based on

their expertise and experience [8].

Education of dental hygienists should also be coordinated with the Incremental Dental Care System to educate them to gain the experience and knowledge that they can perform as a dental hygienist in various situations.

In this study, the dental hygiene process, dental hygiene diagnosis and planning, dental hygiene practice and dental hygiene evaluation were continued by oral administration, and the contents of the dental hygiene were compared with those before and after dental hygiene management.

Education of dental hygienists should also be coordinated with the Incremental Dental Care System to educate them to gain the experience and knowledge that they can perform as a dental hygienist in various situations. Especially poor oral environment is also involved in the increase of periodontal disease and bad breath, increase oral disease, remove plaque between teeth, massage of gums increase resistance to infection to promote disuse of gum epithelia, this tooth It plays an important role in reducing the health and bad breath of the circumference. In foreign cases, the Dental Association in the United States, United Kingdom, Canada, and Australia emphasizes plaque remove, and it has been found that the United States alone consumes over \$5 million of oral hygiene prod-

ucts every year [9].

In this research, it appeared as follows. As a result of testing the statistical significance of the difference of the plaque hydrogen ion concentration before and after dental hygiene management, the t statistic has a significance probability of 11.314. If there is a significant difference between before and after dental hygiene management, it can be said that oral diseases can be well prevented and oral diseases can be prevented (Table 2).

At corresponding t-test 2, the statistical significance of the difference in probe depth before and after dental hygiene management was examined. As a result, the t statistic value was 2.934 and the significance level was 0.004. It can be said that probe depth is also improved (Table 2).

The statistical significance of bad breath before and after dental hygiene management at corresponding t-test 3 was 6.061, the significance level was 0.000, and the significance level was 0.05. Bad breath also showed significant results with dental hygiene management (Table 2).

The correlation coefficient of dental hygiene management is 0.626 attention probability 0.000 before and after plaque hydrogen ion concentration, 0.500 attention probability before and after probe depth is. The probability of caution was 0.040, and after bad breath 0.422 the probability of caution was 0.000. In other words, the correlation coefficient of the Incremental Dental Care System became insignificant both before and after the plaque hydrogen ion concentration, around the probe depth, and before and after the bad breath (Table 3).

There was a significant statistical difference between the before and after groups, F statistic value of 1075.726, significance of 0.000, significance level of 0.05, dental hygienic management, pH, probe depth, and halitosis.

The purpose of this study was to investigate the effect of Incremental Dental Care System on the oral health of university students.

Conclusion

1. According to descriptive statistics, plaque hydrogen ion concentration average 1.4800 ± 0.50212 before dental hygiene management, plaque hydrogen ion concentration average 1.4400 ± 0.51874 after dental hygiene management, probe depth average 1.1100 ± 0.31447 before dental hygiene management, The probe depth average is 1.0300 ± 0.17145 , the average of oral hygiene control 35.0400 ± 9.68277 , and the average of oral hygiene after management 29.1000 ± 8.43933 (Table 1).

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3. The correlation coefficient of dental hygiene management is 0.626 before and after the bacterial membrane pH value, and the significance probability is 0.000. The prevalence of 0.206 significance is 0.04 and the odds of 0.422 significance after bad breath is 0.00. Therefore, correlation coefficient is significant at 0.01 level (Table 3).

4. There was a significant difference in plaque hydrogen ion concentration, probe depth, and halitosis according to dental hygiene management at the significance level of 0.05 (Table 4).

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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