

and evaluated all types of caries activity tests by screening methods and reported that the Snyder test exhibited the best predictability.

The Snyder test was used in the present study. It was observed that the activity in the experimental group showed a gradual decrease. Therefore, it is thought that the semiconductor TiO_2 had some degree of anti-bacterial action against lactobacilli.

When changes in oral cavity bleeding were investigated using Salivaster-Bld, it was found that there were slight changes in the experimental and control groups after one week. Weiger [5] examined the improvement in gingival bleeding with a toothbrush equipped with a TiO_2 semiconductor in 20 subjects over 4 weeks and observed an improvement in the initial period of use. However, it was reported that no improvements were seen after this period. Weiger's results are similar to those of the present research.

The effects of the TiO_2 semiconductor on the gingiva were investigated using PMA-I and CPITN. The PMA-I showed a tendency to decrease on a weekly basis in the experimental group. This is thought to be indicative of the remarkable effect of the TiO_2 semiconductor on gingivitis of the anterior teeth. It is of particular interest that a significant difference between the experimental group and the control group was observed at the 3 week time point. In addition, when the PMA-I changes according to region were investigated, it was observed that there was brushing effect on the gingiva of the papillary region of the anterior teeth of the upper jaw. This is why the TiO_2 semiconduc-

ductors has been reported *in vitro* [7], however, an important problem is whether or not a sufficient photo electrochemical effect is exhibited in the clinical situation. From the results of the present investigation, it is thought that photo decomposition of lactic acid can be expected with normal brushing.

Future studies should be carried out in order to attain even more effective oral hygienic conditions.

Conclusions

Adult female subjects used a toothbrush equipped with a cylindrical TiO_2 semiconductor for 3 weeks and the improvement in the condition of the gingiva as well as the effect on dental plaque were investigated. The following conclusions were obtained when the subjects were divided into two groups, one which used the semiconductor toothbrush (the experimental group, 32 subjects) and the other which used a conventional toothbrush (the control group, 28 subjects).

1) The Pl-I of the experimental group was the same as that of the control group, showing a tendency to decrease week by week during the experimental period. However, no significant differences were observed between the 2 groups in any week.

2) As a result of investigation using the Snyder test, a caries activity test, it was found that the value for the experimental group during the experimental period exhibited a tendency to decrease, although a significant difference compared to the control group was not seen.

3) Examination of the effect on gingival bleeding and... with the saline (control) group...

tor converts light mainly in the anterior region mainly.

It is thought that a similar tendency to that shown by PMA-I was not observed for CPITN due to the fact that in CPITN the molar dentition is also included in the gingiva tested.

The anti-bacterial effect of TiO_2 semicon-

ducting tendency with the saliva/occul blood test revealed a slight improvement in both groups, however, a significant difference between the 2 groups was not observed.

4) The PMA-I of the experimental group during the experimental period showed a tendency to decrease, with a significant difference