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# Clinical Study on the Control of Dental Plaque Using a Photo Energy Conversion a Toothbrush Equipped with a TiO<sub>2</sub> Semiconductor

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**Abstract :** Adult female subjects used a toothbrush equipped with a cylindrical TiO<sub>2</sub> semiconductor for 3 weeks. The subjects were divided into two groups, one which used the semiconductor toothbrush and the other which used a conventional toothbrush. The pl-I of the experimental group was the same as that for the control group, but showed a tendency to decrease week by week during the experimental period. The PMA-I of the experimental group during the experimental period showed a tendency to decrease, with a significant difference being observed compared to the control group after the third week. CPITN in the experimental group showed no obvious tendency towards an improvement when compared with the PMA-I value. It is suggested that improvements in gingivitis and oral cleanliness can be expected through application of the present toothbrush which is equipped with a TiO<sub>2</sub> semiconductor.

**Key words :** Semiconductor, Toothbrush, Plaque control.

## Introduction

As a means of dental plaque removal, the toothbrush is the most effective. The proper use of the toothbrush has been advocated as the first and foremost method for preventing caries [1]. Of course, using the properties of dentifrice or toothpaste, chemical plaque removal and strengthening of the gingiva is also carried out, however, mostly through appropriate handling of the toothbrush itself is the removal of dental plaque from the surface of the teeth and the gingival sulcus accomplished.

Presently, it is said that there are several hundred varieties of toothbrushes on the market, making selection of an appropriate

toothbrush very difficult. When selecting a toothbrush, attention must be paid to the bristles portion of the toothbrush. To be more specific, the shape or form of the tuft portion, the condition of the bristles, the cut of the bundle of bristles, the material used for the tip of the bristles, etc., must all be considered. The shape and material of the handle portion of the brush are also extremely important with respect to the handling of a toothbrush.

The Japanese Ministry of Health and Welfare has determined several necessary requirements or conditions for toothbrushes as follows ; easy to use and effective in the oral cavity, the brush surface must be able to easily reach interdental areas, the handle and brush must be made from strong materials, and so.

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