Abstract. Antibacterial effects confirmed of each mouth rinse on dental biofilm in vitro. In this study, six mouth rinses produced in Korea containing different ingredients (essential oil, cetlypyridinium chloride (CPC), benzethonium chloride (BC), dipotassium glycyrrhizinate (DPZ), and chlorhexidine gluconate (CHX)) were selected. We cultured S. mutans, F. nucleatum and P. intermedia and the plates were incubated with mouth rinses for 30 sec at room temperature according to the manufacturer’s instructions. Antibacterial effects of mouth rinses were examined by the ATP, counted colony forming units (CFU) and scanning electron microscope. SEM after mouth rinses were treated for 5 min on preformed biofilm HA disks, the effects of Hexamedine as an CHX ingredient were confirmed.

Keywords: dental biofilm, mouth gargle

1 Introduction

Dental biofilm contains over 700 bacterial species on the soft and hard tissue in the mouth [1]. Laine, et al. [2] reported that if Amine fluoride-stannous fluoride mouth rinses have been used, gingival bleeding index could be decreased. If gargling water (mouthwash), caregargle, hexamedine, or Listerine on the market in South Korea are treated on planktonic cells, it has over 99% antibacterial effects on periodontitis and cariogenic streptococcus. Besides, 0.1% Chlorhexidine are indicated as restraining the formation of dental biofilm up to 68% [3, 4].

So far, ICT ages studies have been conducted about the efficacy of mouth rinses on a planktonic cell or single bacteria; therefore, in this study, we purchased products on the domestic market and confirmed antibacterial effects of each mouth rinse on dental biofilm in vitro.
2 Study Target Materials and Methods

2.1 Scanning Electron Microscope (SEM)

The preformed biofilms on HA disks were immersed in 2.5% glutaraldehyde of 0.1 M sodium phosphate buffer for 1 hour, postfixed with 1% OSO4 for 1 hour, and dehydrated graded samples through ethanol series. The samples were dried by a critical point drying method and coated with gold by a sputter coater, and then examined with a S-4700 field emission scanning electron microscope [5].

2.2 Statistical Analyses

Statistical analysis was practiced with the IBM SPSS version 24 statistical software (IBM SPSS, Chicago, IL, USA). Data were analyzed by the one-way ANOVA followed by Dunnett’s test.

3 Study Result

3.1 Self-Rated Oral Health According to Dental Treatment Experiences

Antibacterial effects were indicated in all products, but there were considerable
differences according to products.

As being visualized by SEM after mouth rinses were treated for 5 min on preformed biofilm HA disks cultured for 3 weeks, the effects of Hexamedine as an CHX ingredient were confirmed (Fig 3A, C).

Preformed 3 weeks dental biofilm on HA disk treated Hexamedine (Bukwang, Korea)(A, C) and saline (B, D) to control for 5 min at room temperature.

4 Proposal

Bacteria such as Streptococcus, Actinomyces, Fusobacterium, Prevotella were found in gingival crevice plaques [6]. Fusobacterium is the bridge between the early stage and the late stage of dental biofilms [7]. As revealing the efficacy of mouth rinses other than toothbrushing for oral germs removal, further studies about mouth rinses have been actively progressed [8]. As ingredients in mouth rinses, there are phenolic compounds (thymol, eucalyptol, menthol), bis-biguanides (chlorhexidine), quaternary ammonium compounds (CPC, domiphen bromide, BC), herbal extracts (sanguinarine), halogens (fluoride; iodine), and oxygenating agents (peroxides) etc. [9].

5 Result

Antibacterial effects have not been able to be measured by pH control, and all bacterial species of dental biofilm loaded in people’s mouth have not been able to be reproduced ICT ages.

References

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