The effect of chlorhexidine on plaque index and mutans streptococci in orthodontic patients: A pilot study

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Abstract

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ABSTRACT

Aim: The purpose of this study was to assess chlorhexidine effects on plaque index and salivary levels of mutans streptococci (MS) when used as the immersion solution for removable orthodontic appliances and added to their acrylic resin composition. Methods: Forty-five patients (6 to 12 years old) were randomly assigned into three groups with 15 patients each. Group I (control)—without orthodontic appliances disinfection; Group II—removable orthodontic appliances which had been immersed in 0.12% chlorhexidine digluconate overnight (8 hours), and Group III—orthodontic appliances in which 0.12% chlorhexidine digluconate solution had been incorporated into their resin composition. Saliva was collected for quantification of MS and evaluation of plaque index was performed before and after installation of orthodontic appliance at 0, 2, 4, 6, 8, and 10 weeks. Data were analyzed by using analysis of variance. Results: Number of MS colonies in saliva and plaque index showed no statistically differences among groups at the different periods (p > 0.05). Conclusions: It could be concluded that chlorhexidine incorporation into the acrylic resin of removable orthodontic appliances at 0.12% concentration and immersion of the appliance into 0.12% chlorhexidine solution were not effective in reducing plaque index and the number of MS in saliva.

Keywords: Chlorhexidine; Self-Polymerising Acrylic;

Removable Orthodontic Appliances; Mutans Streptococci; Plaque Index

1. INTRODUCTION

The insertion of orthodontic appliances results in a number of new retention sites which favor local adherence and growth of mutans streptococci (MS) [1-3]. These microorganisms can promote biofilm formation on brackets [4,5], orthodontic wires [6], elastics [7], and acrylic resin [8-10]. Results of studies have shown that placement of fixed orthodontic appliance can alter the oral microbiota, increasing plaque volume and levels of MS in saliva [2,5,11-13]. The increased levels of MS may subsequently become a factor favouring the higher incidence of enamel demineralization seen in some patients with fixed orthodontic appliances [14]. This stresses the need of preventive strategies during the treatment period, for example, use of antimicrobial agents [1] to aid in the control of bacterial colonization because toothbrushes cannot completely remove microorganisms from critical retentive sites of the fixed orthodontic appliances [6].

Some disinfectants such as cetylpyridinium chloride, sodium hypochlorite, and chlorhexidine have been suggested for disinfection of orthodontic appliances and removable prosthesis [2,11,15,16]. The choice of disinfectant should be made with regard to its effectiveness in inactivating microorganisms without any adverse effects on the materials [17] and human tissues [18].

In the last few years, chlorhexidine has been one of the most studied antimicrobial substances. It is considered...