

Comparison of Different Mouthwashes During Debonding- A Research

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ABSTRACT:

Background: The use of preprocedural antimicrobial rinse has been found to significantly reduce the number of bacteria. The present study was conducted to compare two different mouthwashes during debonding. **Materials & Methods:** The present study was conducted on 78 patients undergoing orthodontic treatment. Patients were divided into 2 groups of 39 patients each. Group I was prescribed 0.12% chlorhexidine and group II patients received 1.5% hydrogen peroxide as a preprocedural mouthwash. In all subjects, the debonding procedure was carried and blood agar plates were positioned on the patientsface shields and on the dental unit table. Using digital colony counter, colony forming units(CFU) were counted in reflected light. **Results:** Out of 78 patients, males were 39 and females were 39. In group I, before debonding the mean CFU in group I was 100.4 which reduced to 56.2 after debonding where as it was 98.4 which reduced to 42.3 in group II. The difference of change of CFU in each group was significant ($P < 0.05$). **Conclusion:** Both mouthwashes proved to be effective in reducing aerosol production during debonding. There was significant reduction in colonies of bacteria.

Key words: Chlorhexidine, Debonding, Mouthwash.

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INTRODUCTION

Droplet nuclei remain suspended in the air for many hours and can infect persons by direct inhalation. Oral health professionals because of repeated exposures are at high risk for developing infectious diseases due to these droplet nuclei. Aerosols are generated when air, water spray, or air turbine handpieces are used during the dental procedures. Microorganisms in saliva and plaque combine with air or water spray to create an aerosol mist that is suspended in the surrounding atmosphere. This mist may extend several feet from the immediate area of operation.¹

During orthodontic procedures such as wire insertion, attaching the brackets to the tooth surfaces, etc, aerosol generation is usually not expected since no high speed instruments are used. However, at the termination of therapy, the remaining adhesive resin must be removed from the teeth by air turbines which may create an aerosol spray around the operatory area, threatening the orthodontist and the patient with possible infection risk.²

The use of preprocedural antimicrobial rinse has been found to significantly reduce the number of bacteria aerosolized during debonding procedure. Hydrogen peroxide as a mouthwash has also been demonstrated to have useful antibacterial properties and is used as a germicide for the oral infections has been studied both in vivo and in vitro. Oxygenating agents have been employed for supra gingival plaque control and in the treatment of acute ulcerative gingivitis without any harmful side effects on the tissues.³ The present study was conducted to compare two different mouthwashes during debonding.

MATERIALS & METHODS

The present study was conducted in the department of Orthodontics. It comprised of 78 patients undergoing orthodontic treatment. All were informed regarding the study and written consent was obtained. Ethical clearance was obtained prior to the study.

General information such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 39 patients each. Group I was prescribed 0.12% chlorhexidine and group II patients received 1.5% hydrogen peroxide as a preprocedural mouthwash. In all subjects, the debonding procedure was carried and blood agar plates were positioned on the patientsface shields and on the dental unit table. A split-mouth design was used to allow each patient to serve as his or her own control. Following the removal of the fixed orthodontic appliance, the plates were opened. The excess adhesive material left on the teeth removed on the left side of the patient's mouth with a tungsten carbide bur on a handpiece. The plates were left in the same position for an additional 25 min; then, the plates were covered with color-coded lids. The patient was asked to rinse his/her mouth with 10 ml of 0.2% CHG mouthwash for 1 min. The same clinical procedure was performed for the other side of the mouth (right side) with blood agar plates on the face shields and on the unit table. After 5 min of working time and 25 min of waiting for air sampling, the plates were covered and color coded. Using digital colony counter, colony forming units(CFU) were counted in reflected light. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I: Distribution of patients

Total- 78		
Gender	Males	Females
Number	39	39

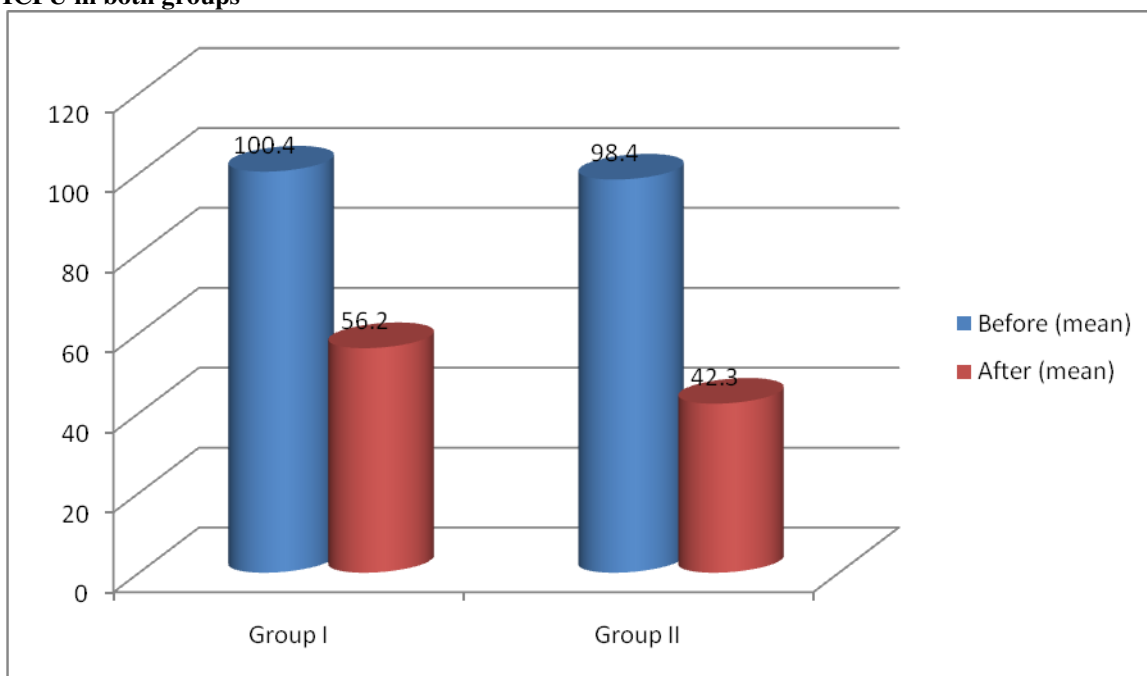
Table I shows that out of 78 patients, males were 39 and females were 39.

Table II CFU in both groups

Groups	Before (mean)	After (mean)	P value
Group I	100.4	56.2	0.01
Group II	98.4	42.3	0.02

Table II, graph I shows that in group I, before debonding the mean CFU in group I was 100.4 which reduced to 56.2 after debonding where as it was 98.4 which reduced to 42.3 in group II. The difference of change of CFU in each group was significant (P< 0.05).

Graph ICFU in both groups



DISCUSSION

Several studies have been conducted in the past on preprocedural rinsing using a variety of methods but so far none of the studies have compared the efficacy of hydrogen peroxide in reducing the aerosolized bacterial contamination. The mechanism includes oxygen releasing mechanical cleansing actions and oxidation or reduction reactions. Free radicals released by hydrogen peroxide break the electron rich alkene double bonds which are responsible for discoloration, resulting in stain removal. The use of hydrogen peroxide as an adjunct to Chlorhexidine has been found to be very effective in reducing plaque scores, and in preventing the stain development.⁴The present study was conducted to compare two different mouthwashes during debonding.

In present study, out of 78 patients, males were 39 and females were 39. We observed that in group I, before debonding the mean CFU in group I was 100.4 which reduced to 56.2 after debonding where as it was 98.4 which reduced to 42.3 in group II.

Kaur et al⁵ found that the use of high speed air turbines with coolant water during the removal of adhesive material significantly increases the amount of aerosol contamination in and around the operatory area. There was reduction of aerobic and anaerobic CFUs in while rinsing with, Hydrogen peroxide showed CFU reductions in both aerobic and anaerobic colonies. In percentage reduction of CFUs, Hydrogen Peroxide group showed maximum reduction after rinsing as compared to before rinse and can be used as a pre-procedural and general mouthwash.

Arshad et al⁶ in their study a split mouth design was followed to allow each patient to serve as his or her own control. The study included 20 patients, randomly assigned into two groups, chlorhexidine and hydrogen peroxide. Blood agar plates were annexed to the face shields, and dental chair. There was a reduction of aerobic and anaerobic colony forming units (CFUs) in both the groups, i.e., CHX (48.72%) and hydrogen peroxide (54.40%).

Blood agar plates were used in this study as it is a general purpose, non selective, enriched medium that promotes the growth of microorganisms. Plate method gives a precise indication of the possible contamination over time by measuring dental particulate and aerosol precipitation on different exposed surfaces in the operatory room.⁷

Jhingta et al.⁸ noted that a combination of chlorhexidine and hydrogen peroxide is superior to chlorhexidine alone when used as mouthwash as an adjunct to routine mechanical tooth cleansing. The combination enhances the efficacy of chlorhexidine in reducing plaque formation.

The mechanism of Hydrogen peroxide includes oxygen releasing mechanical cleansing actions and oxidation or reduction reactions. Free radicals released by hydrogen peroxide break the electron rich alkene double bonds which are responsible for discoloration, resulting in stain removal. The use of hydrogen peroxide as an adjunct to chlorhexidine has been found to be very effective in reducing plaque scores, and in preventing the stain development.

CONCLUSION

Both mouthwashes proved to be effective in reducing aerosol production during debonding. There was significant reduction in colonies of bacteria.

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