WHAT KIND OF ORTHODONTIC TREATMENT CAN EFFECT THE LACTOBACILLI AND S. MUTANS LEVEL?

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ABSTRACT
Orthodontic appliances often provide good retention sites for oral microorganisms. This leads to a high cariogenic challenge in saliva. The purpose of this study was to evaluate saliva Streptococcus Mutans and Lactobacilli levels in different 5 phase on 24 patients need to both removable and fixed orthodontic application. So we had a possibility to determine of the S. Mutans and Lactobacilli level in the same sample. These counts were evaluated at 5 stages: before orthodontic treatment, 4 weeks after using of removable appliances, at least 2 weeks after bonding of the brackets, 1 week after application of mouth varnish, and at the end of the orthodontic treatment. Wilcoxon signed ranks test were used to statistical determination. This study shows that orthodontic removable appliances treatment doesn’t affect the lactobacilli levels significantly (P>0.05) whereas the level of the S. mutans increased significantly (P<0.05). Besides of that the level of the lactobacilli and S. Mutans didn’t change significantly during fixed orthodontic treatment in this oral hygen condition as we advised (P>0.05). In addition, we found that when patients use mouth varnish during fixed orthodontic treatment these microorganism levels reduced significantly (P<0.05).

Introduction
Orthodontic treatment requires high compliance, especially by teenagers, whose compliance is generally low. Furthermore, the ability of the orthodontist to continuously monitor patients’ oral hygiene is limited. Monitoring the oral state is particularly important in certain patients such as those who are handicapped, those who have undergone dental surgery, young children (in early mixed dentition), and those with many (before orthodontic treatment) filled and decayed teeth. Failure to maintain proper oral hygiene leads to tooth damage, consequently affecting the orthodontic treatment. Therefore, the levels of cariogenic pathogens should be constantly reduced during orthodontic treatment. Modulation of the dental biofilm can be conducted via pharmaceutical applications such as toothpastes, mouthwashes, and gels (1, 2).

Removable appliances, because of using in early age and losing of patient cooperation for oral hygen, may cause increasing of cariogenic pathogens account. Clinical reports have shown that patients who receive orthodontic treatment are more susceptible to enamel white spot formation (3).

Fixed orthodontic appliances are considered to be a clinical risk factor in terms of enamel integrity because of plaque accumulation around the bracket base (4). Increased levels of mutants streptococci and of lactobacilli were detected in the oral cavity after bonding orthodontic attachments (5, 6). These microorganisms have
been identified as the main pathogens in dental caries, and their presence increases the risk for decalcification (2, 3, 7). Decalcification is more commonly detected on the buccal surfaces of orthodontically treated teeth than untreated teeth.

Patients who undergo orthodontic therapy have oral ecologic changes such as a low pH environment, increased retentive sites for microorganism, and increased retention of food particles, which may lead to increased proportions and absolute numbers of saliva S. Mutans and lactobacilli (3, 8).

The saliva count reflects the number of tooth surfaces colonized by these bacteria. The lactobacilli and S.mutans counts are an important factor in making up the "Risk profile" of a patient (9).

Mutans streptococci have been associated in particular with early demineralization while lactobacilli are implicated more with lesion progression and cavitation.2 High saliva counts of lactobacilli seemed to reflect conditions that enhanced the risk of colonization of mutans streptococci (10).

Understanding of this microorganism levels in patients before, during, and after orthodontic therapy may help to determine caries risk levels and may thus lead to appropriate preventive or antimicrobial therapy (11).

Materials and Methods
The subjects of this study were 24 children between the ages of 14 and 17 years who were need both removable and fixed orthodontic treatment at Dicle University, Faculty of Dentistry and Department of Orthodontics.

Exclusion criteria included the use of oral antimicrobials or antibiotics within the past 3 months, the presence of prosthodontic appliances, or significant systemic disease. We were advised them to brush their teeth and the removable appliances four times every day during this study period.

The counts of these microorganism were evaluated at 5 stages: before orthodontic treatment, 4 weeks after using of removable appliances, at least 2 weeks after bonding of the metallic brackets (Snergy, RMO Co, USA), 1 week after application of mouth varnish, and at the end of the orthodontic treatment.

The CRT Bacteria Test (Vivadent Ets., Lichtenstein) was used to determine the measured the Streptococcus mutans (S. mutans) and lactobacilli count in saliva by means of selective culture media (Fig. 1, 2).

Before collecting saliva for the CRT Bacteria Test, the patients were asked not to eat or drink for at least an hour. Salivation was stimulated by having the children chew a paraffin pellet for 5 minutes. The saliva from each patient was collected in a calibrated container. The agar carrier was
removed from the test vial, and a NaHCO₃-tablet was placed at the bottom of the vial. The protective foils were removed carefully from the agar surface. Using a pipette, agar surface were wetted with saliva and excess was allowed to drip off. The agar carrier was placed back into the vial, which was closed tightly. The vials were incubated at 37°C for 48 hours. After that all of the samples were evaluated as product company directions by its scala. Findings of 10⁵ CFU or more of lactobacilli and mutans streptococci per ml saliva indicate a high caries risk. (Fig. 3)

**Results and Discussion**

For evaluation of the differences the level of the S. mutans and lactobacilli Wilcoxon Singned Ranks test was used (Table). According to this assesment lactobacilli level didn’t change significantly in comparison of before and after removable appliances using (P>0.05). There was a significantly increase in S. mutans levels between before the treatment and firsth control (P<0.01).

When brachets were fixed two weeks after that the mutans level increased significantly (P<0.001). But, lactobacilli level didn’t show any differences like removable appliances phase (P>0.05).

Because of there was a rising in account of the mutans level, we advised patients to use mouth varnish. There was no differences for lactobacilli level, so we didn’t asses the this microorganism level about mouth varnish. In mutans level we found a significantly decrease (P<0.01). At this moment we decided to compare of two different mouth varnish effect to the mutans level. So different two varnish one of them includes clorhexidine (Klorhex Drogsan Co, Turkey) and the other includes benzidam HCl (Tatum Verde Santa Farma-ANGELINI Co, Turkey) were gived to pa-
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<td>A1-A2</td>
<td>.157</td>
<td>n.s.</td>
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<td>B1-B2</td>
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<td>L-B1</td>
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A2: Level of the lactobacilli after removable orthodontic appliances.
B1: Level of the S. Mutans before treatment.
B2: Level of the S. Mutans after removable orthodontic appliances.
C1: Level of the S. Mutans before fixed orthodontic application.
C2: Level of the S. Mutans after fixed orthodontic application.
D1: Level of the Lactobacilli before fixed orthodontic application.
D2: Level of the Lactobacilli after fixed orthodontic application.
G: Level of the S. Mutans after Clorhexidine application.
H: Level of the S. Mutans after Benzidamin HCl application.
K: Level of Lactobacilli after full orthodontic treatment.
L: Level of the S. Mutans after full orthodontic treatment.

This study shows that orthodontic removable appliances treatment doesn’t effect the lactobacilli levels significantly (P>0.05) but the level of the S. mutans was influenced significantly (P<0.05).

During the last decades it has been convincingly demonstrated that mutants streptococci and lactobacilli are of etiologic importance in dental caries. The knowledge has been applied in several clinical studies and the results show that microbiological examinations can be valuable adjuncts in the diagnosis, treatment and prevention of dental caries.

In patients with high caries activity and high counts of mutants streptococci, chlorhexidine may be employed as an adjunct to other preventive measures. Chlorhexidine delivered in a gel form has been shown to be effective in the control and prevention of caries. Combinations of chlorhexidine with fluoride may be even more effective. Sustained release devices, like varnishes, reduce the numbers of mutants streptococci in a patient’s mouth to levels below detection for long periods, but their effectiveness in preventing and controlling caries has not yet been assessed. The decision to use microbiological methods to aid diagnosis, and chlorhexidine to reduce or eliminate mutants streptococci, rests with the practitioner.(12)

Although the microbiological tests for caries activity or prediction are not 100 per cent accurate, they can be useful in certain situations. In addition, chlorhexidine as an adjunct in control and prevention of caries has been shown to have value. This short review introduces readers to the literature, so that they will not dismiss microbiology, but make decisions on the use of microbiological methods based on their own experience and the experience of others.(12)

Fornier et al (13) suggested that, the initial affinity of S. mutans to metal brackets was statistically significantly lower than that to plastic and porcelain brackets with and without saliva coating.
Eronat et al. (14) investigated the effect of the mouth varnish in fixed orthodontic patients. According to their study, after the chlorhexidine containing varnish treatment the levels of Streptococcus mutans in saliva were significantly reduced after one week (p < 0.01) and continued reduction for one month (p < 0.05). After twelve weeks Streptococcus mutans levels in saliva were given a relative increase. No significant suppression was found in the placebo group (p > 0.05). The results suggested that Cervitec varnish reduces salivary Streptococcus mutans levels and that the application should be repeated every 3 months to get antibacterial effect.

There aren’t any sufficient literatures about effect of the removable orthodontic appliance to lactobacilli and S. Mutans level. According to our findings lactobacilli level didn’t change significantly in comparison of before and after removable appliances using. But there was a significantly increase in S.mutans levels between before the treatment and firsth control.

Conclusions
The findings suggest that extensive orthodontic application effectively change the levels of caries associated with microorganisms during treatment period. Interestingly, when the removable orthodontic appliances increase the only Lactobacilli level, The fixed orthodontic application increase the only S. Mutans level. Clinical examination and interview were performed to obtain information about level of S.mutans and lactobacilli in saliva. What kind of orthodontic treatment is decided, better oral hygiene can be achieved if a sustained good oral hygen motivation and delivery of an anticiarigenic drug is used, because it maintains therapeutic levels of the drug in the oral cavity in orthodontic patients.

REFERENCES