SDM
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"COMPARISON OF ENAMEL COLOR ALTERATIONS ASSOCIATED WITH DIFFERENT STAINING AGENTS- AN IN-VITRO STUDY."

By

DR. VIDHI VATSALA

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Under the guidance of

DR. HARSHAVARDHAN KIDIYOOR

ASSOCIATE PROFESSOR

DEPARTMENT OF ORTHODONTICS & DENTOFACIAL ORTHOPAEDICS

S.D.M COLLEGE OF DENTAL SCIENCES & HOSPITAL

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ABSTRACT

BACKGROUND AND OBJECTIVES: Clinical studies have reported that the color of natural teeth changes after orthodontic treatment. Taking into consideration the diet of the Indian population, which chiefly includes beverages like tea and coffee, and spices like turmeric, the aim of the study was to evaluate the color changes of enamel before and after fixed orthodontic therapy and to compare the effects of different staining agents on enamel discoloration.

MATERIALS AND METHODS: Hundred freshly extracted premolars were divided into four groups of **n=25** each. Base line color measurements were taken for all samples before bonding via handheld reflectance spectrophotometer (*X-Rite I1 Pro)*. After the baseline measurements the samples were etched conventionally using 37% phosphoric acid for 30 sec followed by bonding using LED curing light. The bonding adhesive used was Transbond XT. Once the brackets were bonded they were suspended in test solutions. Group 1 is the control group in which teeth were stored in distilled water and in Group 2, 3 and 4 the samples were dipped in tea, coffee and turmeric solution respectively for one week after bonding. The samples were then retrieved and debonded, the teeth surface was cleaned with 8 fluted tungsten carbide bur and polished using pumice. All the samples were spectrophotometrically evaluated post debonding. Color evaluations were made in accordance with CIE (Commision Internationale de l'Eclairage) L*a*b color system. The ΔE values were compared for samples before and after debonding.

RESULTS: The L^* values for all the groups (1, 2, 3 & 4) decreased before and after the experiment. Similarly, the a^* values in all the four groups became more negative before and after the experiment. The b^* values in groups 1, 2 & 3 became more positive before and after experiment where as in group 4 it became more positive. The mean ΔE difference value was found maximum for group 3 (coffee) -12.4560 and minimum for group 1 (water) - 9.7120.

For group 2 and group 4 the values were comparable- 11.4960 and 11.3400 respectively. One Way ANOVA test was used for intergroup comparison with $p<0.005$ as test of significance. However, the p value for present study was 0.159 (>0.005), thus no statistical significance was found in the ΔE difference values in between the groups.

CONCLUSION: From the study it can be concluded that orthodontic bonding and debonding procedures do have an effect on enamel discoloration. Although, the effect of various stains used in the study namely water, tea, coffee and turmeric had similar effects on enamel color alteration and did not vary significantly amongst themselves. However color stability of orthodontic materials like transparent brackets, elastomeric threads, modules and chains are more susceptible to change with colored beverages than the tooth color itself.

KEY WORDS: orthodontic bonding, debonding, enamel discoloration, spectrophotometer, CIE Lab system.