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Ultraviolet–Visible Spectrophotometric Analysis of Tooth Whitening Efficiency of Ultraphosphate

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Abstract

Aim: To compare the efficiency of Sodium Ultraphosphate solution in tooth whitening with 30% Hydrogen per oxide and McInnes solution using Ultraviolet–visible spectrophotometry. **Methods:** 60 human extracted central incisors were selected and decoronated. The samples were subjected to an artificial staining procedure for 3 days using freshly prepared coffee extract. The samples were then washed under running water for 10 seconds and randomly divided into 3 groups with 20 samples each. The whitening procedure was carried out for 10 minutes - Group 1 was treated with 10 ml of 30 % Hydrogen per oxide solution and Group 2 with 30ml of McInnes solution and Group 3 with 20% 10 ml of Sodium Ultraphosphate solution. After 10 minutes the test solutions mixed with the removed caffeine stain from tooth samples were analyzed spectrophotometrically and the difference in the absorbance values of the solutions before and after stain removal is directly proportional to the amount of caffeine present. The results were statistically evaluated by One-way analysis of Variance followed by Tukey's post hoc test. **Results:** The percentage of caffeine removed by Group 3 - Ultraphosphate solution was significantly higher (55%) then that of Group 1 - Hydrogen per oxide (48%) and Group 2- McInnes solution (2.98%). **Conclusion:** Our results clearly indicate that Sodium Ultraphosphate could be used as a potential stain remover in severely discoloured tooth when compared to H_2O_2 and McInnes since it has got only a strong chelating action on tooth stains, without much adverse effect on dental hard and soft tissues. Development of a novel teeth stain removal system incorporating Sodium Ultraphosphate is expected in future.