Dental Whitening and Enamel Loss

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The experiment investigated whether whitening toothpastes have a lower pH than non-whitening toothpastes, whether whitening toothpastes whiten teeth more than non-whitening toothpastes and whether whitening toothpastes cause a greater loss of dental enamel than non-whitening toothpastes. Ten molar teeth, 3 whitening and 2 non-whitening toothpastes were used. Each of the toothpastes was used to brush two different teeth daily for 21 days. In between brushing, the teeth were soaked in saline solution to replicate the oral environment. Each tooth was marked to indicate where the caliper was to be placed for taking measurements on days 0, 11 and 21. Images of the teeth were taken using a microscope before and after testing. A tooth color shade guide was used to determine the color of the teeth on days 0, 11 and 21. The pH ranged from 6.9 - 8.8 and showed no relationship between toothpaste types, with Oral B Original being the only acidic toothpaste. The whitening toothpastes improved tooth whiteness from 3-7 shades with the non-whitening toothpastes bringing about no change. The whitening toothpastes caused more erosion of dental enamel(0.07 - 0.13mm) than the non-whitening toothpastes (0 - 0.01mm). In conclusion, the three whitening toothpastes did whiten teeth (improve ‘whiteness’) more than the two non-whitening toothpastes tested. No relationship was found between the pH and toothpaste type; however, Oral B Original was significantly more acidic than the other toothpastes tested. All three whitening toothpastes caused a greater loss of the dental enamel than the two non-whitening toothpastes.

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