

IN VITRO EFFECTS OF TWO OVER-THE-COUNTER BLEACHING PRODUCTS ON GINGIVAL EPITHELIUM AND DENTAL RESTORATIVE MATERIAL

F. CIMINO, A. TOMAINO, A. SPECIALE, M. CRISTANI, D. TROMBETTA, A. SAIJA

¹Dept. Farmaco-Biologico, School of Pharmacy, University of Messina, Italy

Dental bleaching is a simple and conservative procedure for aesthetic restoration of vital stained teeth. There are many bleaching agents commercially available with various constituents, such as hydrogen peroxide, sodium chlorite and carbamide peroxide. Carbamide peroxide decomposes to produce hydrogen peroxide, which may be considered as the active ingredient of choice for bleaching because of its low molecular weight and its ability to denature proteins. While dentists still perform tooth-whitening procedures, most bleaching treatments are performed by patients with either dentist-prescribed or over-the-counter whitening products. As these products contact tooth structures for extended periods of time and inadvertently may come into contact with oral mucosa, teeth and dental restorations, the effects of bleaching products on gingival epithelium and dental materials have attracted much attention. The aim of our study was to evaluate if the in vitro exposure to two over-the-counter whitening products (Mentadent Xtra White whitening treatment, containing hydrogen peroxide, and Iodosan whitening treatment, containing sodium chlorite) may induce tissue damage in human gingival epithelium and increase release of metals (which are toxic for human organisms) from amalgam samples. Exposure for 24 h of reconstituted human gingival epithelium samples (SkinEthic, Nice, France) to subtoxic concentrations (unable to significantly affect cellular viability, as demonstrated by the MTT test and histological analysis) of both whitening formulations influences the release of inflammation mediators (such as IL-1beta, PGE₂ and TNF-alpha) and the tissue accumulation of MDA/HNE and protein carbonyl groups. These effects induced by the two formulations under study are clearly related to the respective active principles contained in them (hydrogen peroxide and sodium chlorite, used in our experiments as reference drugs). However, although the pattern of modifications elicited by Mentadent Xtra White and Iodosan was similar to that observed following exposure to hydrogen peroxide and sodium chlorite respectively, the excipients/technology employed in these two formulations appear to minimize the dangerous power of their active ingredients. Furthermore, repeated exposures of amalgam samples to Mentadent Xtra White and Iodosan caused a Hg and especially Cu release higher than that elicited by exposure to the vehicle alone, but lower than that observed following exposure to hydrogen peroxide and sodium chlorite respectively. In conclusion, these data demonstrate that exposure to over-the-counter bleaching products may be a factor inducing damage on gingival epithelium and dental restorative material, but, due to their formulation, these products are safer of their active ingredients.