Orthodontics and Dental Materials Science

Abstract (600 word limits)

White spot lesion (WSL) represents the early manifestation of the dental caries and can be treated by a non-invasive management. The white spot lesion is still the most complicated dilemma facing orthodontists during orthodontic treatment using fixed appliances. Light cured bioactive glass varnishes releasing calcium, phosphate, strontium and fluoride for controlled remineralization exhibit promise for prevention of WSL.

Objectives: To evaluate *in vitro* the effectiveness of application of novel BAG varnish in the protection of enamel surfaces against acid challenge.

Materials and Methods: A total of 6 enamel blocks were selected and distributed randomly into two groups (n = 3). Group A: Clinpro^{TM} white varnish (3M ESPE TM) was used to coat the enamel surface and group B: light cured BAG varnish which consists of BAG (35% SiO_2, 45% $CaCO_3$, 7.5% Na_2CO_3, 6% P_2O_5, 6% SrF_2) mixed with resin (70/30 UDMA/HEMA, 0.6% EDMAB, 0.3% CQ, and 1% 4META) with glass: resin ratio of 60:40 was used. The enamel blocks were covered with two layers of acid-resistant nail varnish except the exposed enamel surface. Each three enamel blocks were mounted vertically in small plastic tubes and scanned by XMT before and after immersion in 10ml artificial saliva demineralizing buffer (pH = 4) over two time periods 24 hours and 96 hours at 37ºC.

Result: The evaluation of XMT slices demonstrated the ability of the BAG varnish to prevent the development of WSL after immersion in AS pH4 for 24 hours and 96 hours. The line profiles have confirmed the protective efficacy of BAG varnish in reducing the acid demineralization.

Conclusions: This ex-vivo acid challenge study illustrates that the novel BAG varnishes can be used effectively to prevent the WSL and protect the teeth from low pH environment in oral cavity. Hence, the novel BAG varnish has the potential to prevent demineralization and caries.

Biography (200 word limit)

I am assistant professor in orthodontics at the Institute of Dentistry, Babylon University / Iraq. I studied Dentistry in Baghdad University and awarded my MSc in 2002. Now I am studying PhD in Dentistry at Queen Mary University of London/UK, my research focusing on the bioactive glass varnishes applied during orthodontic treatment. I am fully funded and supported by Ministry of higher education and scientific research / Republic of Iraq. I have published over12 papers in orthodontics and dental materials science.

References (With Hyperlink)

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