COMMENTARY

ANTIBACTERIAL ACTIVITY AND PHYSICAL PROPERTIES OF CONVENTIONAL GLASS-IONOMER CEMENTS CONTAINING CHLORHEXIDINE DIACETATE/CETRIMIDE MIXTURES

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There are many clinical indications for which the use of conventional glass-ionomer cement (GIC) restorative materials would be advantageous. One such indication is the Atraumatic Restorative Treatment (ART) technique. However, ART is usually performed in situations where state of the art dental equipment is not available and therefore the outcomes of treatment rarely include the total elimination of disease causing bacteria. The purpose of this study is to determine whether the addition of antibacterial agents can reduce the possibility of secondary caries without significantly reducing the fluoride-releasing capacity or deteriorating the physical properties of the glass-ionomer restorative material. This study tested antibacterial activity, microhardness, and cumulative fluoride-releasing patterns of two conventional GICs (Fuji IX and Ketac Molar) containing chlorhexidine diacetate/cetrimide mixtures.

The clinical ramifications of the study regarding antibacterial activity are generally positive. The study confirmed that the addition of the antibacterial agents exhibited a continuous antibacterial effect for up to 90 days against *Streptococcus mutans* (MS) and *Lactobacillius casei* (LB). Chlorhexidine has been shown to be particularly effective against MS and Cetrimide against LB. Therefore, the combination of these two antibacterial agents would challenge the two most prevalent disease-causing bacteria in the oral cavity. Fluoride release was not significantly different between the control and experimental groups. However microhardness tests revealed that there was a significant difference between the GICs used as controls versus the experimental groups with added antibacterial agents.

Essentially the authors are making a case that the addition of Chlorhexidine diacetate and Cetrimide will provide an antibacterial effect for up to 90 days without *seriously* deteriorating the surface hardness of the restoration or reducing the fluoride releasing capabilities. For the clinician, it essentially comes down to a decision of whether, in a given situation, it is more important to obtain the additional antibacterial effect that can be provided by chlorhexidine diacetate/cetrimide or whether it is more important to obtain the added surface hardness provided by a conventional GIC. Because the primary reason for treating patients with the ART technique is to reduce or eliminate bacterial contamination, it would appear that the use of a glass ionomer restorative material that included an antibacterial agent would be of benefit.

Unfortunately, glass ionomer restorative materials are currently not available with the additional antibacterial agents incorporated into the product. The authors of this study accomplished that task by incorporating the antibacterial products into the powder of a conventional glass ionomer restorative. In order for this technique to become more widely used, dental manufacturers will have to make a determination that there will be a sufficient number of dental providers who would purchase such a product and they may then make it available. Additionally, manufacturers may have the resources to develop a glass ionomer restorative material that contains antibacterial agents and is able to overcome the most significant problem discovered in the study, the reduction of surface hardness. Indeed, it would be greatly beneficial for all dental providers if they were able to develop a product that includes fluoride release, additional antibacterial benefits, and that maintains or possibly even increases the surface hardness of the material.

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