Dental Sealants and Bisphenol A (BPA) Policy Statement
Association of State and Territorial Dental Directors (ASTDD)
Adopted: February 3, 2011

Problem

Pit-and-fissure sealants have been used effectively as part of a comprehensive approach to caries prevention for children and adults on an individual basis or as a public health measure for at-risk populations.[1] Bisphenol A (BPA), a chemical used to manufacture polycarbonate plastics and found in many food and drink containers as well as dental sealant and composite resin materials, may cause some adverse health effects such as problems with reproduction and development.[2] A recent systematic review examining the existence of BPA in dental materials and its relationship to any potential health risks recommends continued use of these dental products for children, with firm adherence to precautionary application techniques.[3] However, the same systematic review, advises pregnant women to defer elective dental treatment with composite and sealants. The American Dental Association (ADA) and experts from the American Academy of Pediatric Dentistry (AAPD) reviewed the evidence and concluded that dental sealants should still be recommended for all populations because the purported risks were minimal and could be controlled by routine operative procedures.

Methods

Placement of resin-based sealants on the permanent molars of children is effective for caries reduction.[4] Sealants can be used in primary prevention[5] or secondary prevention of dental caries.[6] Working with partners at local and state levels, school-based sealant programs help students with limited access to dental care receive dental services. Those programs are recommended on the basis of strong evidence of effectiveness in reducing caries on occlusal surfaces of posterior teeth among children.[1]

Resins in sealants and composites are composed primarily of BPA derivatives rather than pure BPA.[3] BPA may be released from dental resins in sealants and composites through salivary enzymatic hydrolysis of BPA derivatives, and BPA is detectable in small amounts in saliva for up to three hours after resin placement.[3] However, this finding was not consistent among all studies; other in-vitro studies failed to detect any traces of BPA derivatives over a period of ten days.[7,8,9] The quantity and duration of systemic BPA absorption from dental resins is not clear from the available data.[3] However, the amount of the dental sealant material usually used in children does not influence the serum concentration levels of BPA.[10]

Dental sealant and composite product selection is important since dental resin materials contain different molecular formulations that determine the release of BPA. Dental products containing the bisphenol A derivative glycidyl dimethacrylate (bis-GMA) are less likely to be hydrolyzed to BPA so there is less risk of BPA absorption and subsequent possible adverse health effects than those containing bisphenol A

dimethacrylate (bis-DMA).[3] Studies have consistently shown that bis-DMA hydrolyzes to BPA on contact with salivary esterases. [11,12] This process does not occur with bis-GMA making bis-GMA based resins preferable in terms of adverse health effects rather than bis-DMA based products.[11,12,13]

Bis-GMA-based resins seem to be used most commonly in the U.S. market according to a listing of products with the greatest market share[14] and the monomer compositions listed on current material safety data sheets (MSDSs).[3] Most other BPA derivatives used in dental materials have not been evaluated for adverse health effects.

The literature suggests the following simple precautionary application techniques that can be used to considerably reduce BPA exposure:

- Adequate light curing[15] that incorporates a longer curing time with lower intensity lights results in less cytotoxicity and less release of the unpolymerized components,[16,17]
- Rinsing the mouth for about 30 seconds following application of a dental sealant with water or saline solution or rubbing the sealant using a mild abrasive such as pumice, either on a cotton applicator or a prophy cup is suggested to be effective in minimizing the monomers release,[18] and,
- Further, temporarily blocking off the sealed area with a rubber dental dam also helps in minimizing the leach of the monomers to the saliva.

The ADA and key government agencies concur that there is a lack of evidence and toxicological information demonstrating that the low-level of BPA exposure that may result from dental sealants and composites poses any known health threat.[19] The Department of Health and Human and Services considers population exposure to BPA from dental sealants low and infrequent.[20] In addition, the Food and Drug Administration (FDA) asserts that FDA-regulated products on the market that contain BPA are safe.[21]

Policy Statement

The Association of State and Territorial Dental Directors supports and recommends the continued use of composites and dental sealants for all populations.

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