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Abstract

OBJECTIVES:
This study investigated the stability of compounds of dental sealant materials in a salivary matrix.

METHODS:
Various amounts of bisphenol A (BPA), bisphenol A dimethacrylate (BIS-DMA) or triethylene-glycol dimethacrylate (TEGDMA) were added to whole salivary samples, and stored at -70 degrees C or -20 degrees C for up to 4 months. In other experiments, four separate whole salivary or water samples with BIS-DMA (200 ng/ml) were incubated for 0, 1, 2, 4 or 24h at 37 degrees C. Levels of analytes were determined by capillary gas chromatography/mass spectrophotometry (GC/MS) and high-performance liquid chromatography (HPLC).

RESULTS:
BPA was stable under all tested conditions. Samples originally containing BIS-DMA had high levels of BPA and almost no BIS-DMA after 4 months at -20 degrees C. Salivary samples incubated at 37 degrees C originally containing only BIS-DMA (200 ng/ml) demonstrated rapid decreases of BIS-DMA and increases of BPA. By 24h, the mean BIS-DMA concentration fell to 21.8 (25) ng/ml, while BPA increased to 100 (48) ng/ml. Only slight decreases in BIS-DMA and no BPA were present in the water samples incubated at 37 degrees C. BPA, BIS-DMA, and TEGDMA were stable if salivary samples were stored at -70 degrees C. Acidification of salivary samples prevented the breakdown of BIS-DMA.

SIGNIFICANCE:
BIS-DMA is converted rapidly to BPA in the presence of whole saliva. This could account for the findings of BPA in clinical samples collected after the placement of certain sealant products. Decreasing salivary pH and temperature can slow this process and this method should be used for clinical studies of salivary BPA leached from restorative materials.

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