The release of residual monomeric methyl methacrylate from acrylic appliances in the human mouth: an assay for monomer in saliva.


Source

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Abstract

A gas-liquid chromatography assay has been developed for the estimation of methyl methacrylate monomer (MMA) in whole saliva, with a lower limit of detection in the order of 1 microgram/mL. Healthy human dentate subjects wore recently made autopolymerized or heat-polymerized polymethyl methacrylate (PMMA) palatal appliances. MMA released into saliva was detected for up to one week after insertion of autopolymerized appliances, with a maximum concentration of 45 micrograms/mL in whole saliva or 180 micrograms/mL in the salivary film on the fitting surface. The MMA was not detected in blood or urine. MMA was also present in the saliva of volunteers wearing appliances which had been heat-polymerized at 70 degrees C for one hr but not cured at 70 degrees C for three hr. The maximum amount of monomer released by an autopolymerized base plate was 29.5 micrograms in the first hour, which, while not a toxic or primary irritant dose, could possibly sensitize patients or elicit an allergic reaction. For minimization of monomer release, autopolymerized appliances should be immersed for 24 hr in water before being worn.