The Effect of Bruxism on Mercury Leakage from Amalgam Restorations

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For over a century, silver amalgam has been successfully utilized to restore teeth worldwide. Despite its many advantages, there have always been concerns about this material’s safety due to its mercury content. The World Health Organization indicated that trace amounts of mercury constantly leak from amalgam fillings. Although these amounts are too minute to pose significant health risks, research demonstrated that mechanical stimulation by chewing and bruxism greatly increases this amount. This study was designed to investigate the impact of nocturnal teeth grinding on mercury leakage from amalgam restorations. Forces equivalent to those of chewing and especially bruxism were applied to ninety in vitro models for different time periods and the amount of mercury generated was measured by means of cold-vapor atomic fluorescence spectrophotometry. Except for the control group (unstimulated state), results suggested a linear relation between the duration of stimulation and the recorded levels of mercury leakage. Compared to the control group (0.066 micrograms), the estimated absorbed amounts of mercury for 24 hours were much higher for the mastication group (3.32 micrograms) and drastically higher for the bruxism group (71.90 micrograms). The present study revealed that bruxism not only yielded elevated mercury levels but also that these amounts could be significant enough to be of toxicological relevance. Because mercury is a powerful neurotoxin and bruxism is on the rise, more studies are necessary to further assess its potential health implications and every effort should be directed towards minimizing the use of mercury in dentistry.

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