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Mercury release from dental amalgam restorations after magnetic resonance imaging and following mobile phone use.

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Abstract

In the 1st phase of this study, thirty patients were investigated. Five milliliter stimulated saliva was collected just before and after MRI. The magnetic flux density was 0.23 T and the duration of exposure of patients to magnetic field was 30 minutes. In the 2nd phase, fourteen female healthy University students who had not used mobile phones before the study and did not have any previous amalgam restorations were investigated. Dental amalgam restoration was performed for all 14 students. Their urine samples were collected before amalgam restoration and at days 1, 2, 3 and 4 after restoration. The mean \pm SD saliva Hg concentrations of the patients before and after MRI were 8.6 \pm 3.0 and 11.3 \pm 5.3 microg L⁽⁻¹⁾, respectively ($p < 0.01$). A statistical significant ($p < 0.05$) higher concentration was observed in the students used mobile phone. The mean \pm SE urinary Hg concentrations of the students who used mobile phones were 2.43 \pm 0.25, 2.71 \pm 0.27, 3.79 \pm 0.25, 4.8 \pm 0.27 and 4.5 \pm 0.32 microg L⁽⁻¹⁾ before the amalgam restoration and at days 1, 2, 3 and 4, respectively. Whereas the respective Hg concentrations in the controls, were 2.07 \pm 0.22, 2.34 \pm 0.30, 2.51 \pm 0.25, 2.66 \pm 0.24 and 2.76 \pm 0.32 microg L⁽⁻¹⁾. It appears that MRI and microwave radiation emitted from mobile phones significantly release mercury from dental amalgam restoration. Further research is needed to clarify whether other common sources of electromagnetic field exposure may cause alterations in dental amalgam and accelerate the release of mercury.

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