بررسی اثر ژل کربامید پراکساید ۱۶٪ (Nite White) بر آزادسازی جیوه از آمالگام‌های ایرانی و خارجی با ذرات کروی و مخلوط به روش جذب اتمی بخار سرد

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Title: Evaluation of the effect of 16% carbamide peroxide gel (Nite White) on mercury release from Iranian and foreign spherical and admixed amalgams by cold vapor atomic absorption method.

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Background and Aim: Nowadays, esthetic dentistry has become an important part of modern dentistry. Bleaching is considered as a conservative, safe and effective way for treatment of discolored teeth. Although bleaching is commonly used on anterior teeth, the bleaching gel may come into contact with patient's former amalgam restorations and result in corrosive effects, dissolution of amalgam phases and increasing release of mercury. Mercury released from dental amalgam during mouthguard bleaching can be absorbed and increase the total mercury body burden. The aim of this study was to determine the amount of mercury released from Iranian and foreign brands of amalgams with spherical and admixed particles, polished and unpolished, after 16%carbamide peroxide gel application.

Materials and Methods: This experimental in vitro study was performed on 256 Iranian and foreign amalgam samples with spherical and admixed particles. The provided samples were put in distilled water and classified according to the type of amalgam, shape of particles and quality of surface polishing. The test samples were placed in Nite White 16% carbamid peroxide gel and control samples were put in phosphate buffer (Ph=6.5) for 14 and 28 hours. The amount of released mercury was calculated using AVA-440 Mercury Analysis System (Thermo Jarrell Ash model SH/229) with cold-vapor atomic absorption. Data were analyzed using t-test, four way and three way ANOVA tests with $P<0.05$ as the level of significance.

Results: 16% Nite White carbamide peroxide gel caused a significant increase in amount of mercury released from amalgams in all groups ($P<0.05$). Mercury release from Iranian amalgam was higher than that from the foreign brands ($P<0.05$). There was no significant difference in mercury released from spherical and admixed amalgams ($P>0.05$). The amount of mercury released from Iranian and foreign amalgams was time dependent ($P<0.05$). Furthermore, the amount of mercury released from unpolished amalgams was higher than polished ones ($P<0.05$).

Conclusion: The present study indicated that exposure of amalgam to 16% Nite White carbamide peroxide gel causes a significant increase in mercury release from the amalgam which is significantly influenced by the brand, exposure time, and surface polishing.

Key Words: Carbamide peroxide gel; Nite White; Amalgam; Bleaching; Mercury; Polishing

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