

Effect of Ionizing and Non-ionizing Radiation On Amalgam, Composite and Zirconomer Based Restorations

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Keywords: Electromagnetic Fields (EMFs), Mercury, Mobile phones, MRI

Dear Editor,

With great interest we read the article by Patel et al., entitled “An invitro Evaluation of Microleakage of Posterior Teeth Restored with Amalgam, Composite and Zirconomer–A Stereomicroscopic Study” [1] that is published in the July issue of the Journal of Clinical and Diagnostic Research (Vol-9(7): ZC65-ZC67, 2015). In this article, the authors performed an in vitro stereomicroscopic study to evaluate the microleakage of posterior teeth restored with amalgam, composite and zirconomer. In their study, cavities prepared on the occlusal surface, were restored with amalgam, composite and zirconomer. These researchers reported that based on their findings, zirconomer revealed the highest level of microleakage compared to composite and amalgam. The microleakage of composite was moderate and amalgam showed the minimum level of microleakage. This paper seems to have a serious shortcoming. Substantial evidence shows that in the studies on microleakage of amalgam, the challenging issue of exposure to different sources of electromagnetic fields (e.g. Wi-Fi, mobile phones and mobile base stations, or even electrical household appliances such as hair dryers, electric shavers and vacuum cleaners) and their effects on enhanced microleakage should be taken into account. Over the past several years, our lab at the Ionizing and Non-ionizing Radiation Protection Research Center (INIRPRC) has performed extensive experiments on the health effects of exposure of animal models and humans to different sources of electromagnetic fields (EMFs) such as cellular phones [2-9], mobile base stations [10], mobile phone jammers [11], laptop computers [12], radars [3], dentistry cavitrons [13] and MRI [14,15]. Our first report on the role of exposure to MRI or microwave radiation emitted by mobile phones in enhancing the release of mercury from dental amalgam restoration was published in 2008 [8]. Due to some limitations in this early study, we have recently investigated the effect of exposure to relatively stronger magnetic fields (0.25 T in our previous report versus 1.5 T in our recent study). Interestingly, this study confirmed our previous findings that the release of mercury from amalgam fillings can be enhanced by exposure to EMFs [16]. We have also shown that some of the papers which reported no increased release of mercury after MRI, may have some methodological flaws [17]. On the other hand, microleakage studies also provide further evidence that supports the biologically detrimental effect of MRI on increasing the microleakage of dental amalgam fillings [18,19]. As there is no reports indicating that exposure of other filling materials such as composites to EMFs enhances the microleakage, we believe that the significant role of rapidly increasing exposure to EMFs in increasing amalgam microleakage is not addressed in the study of Patel et al., In this light, to obtain more reliable results, the comparison of microleakage of amalgam and non-amalgam filling materials should

be performed in both presence and absence of EMFs. We hope that these comments will provide evidence for broader understanding of the challenging issue of enhanced dental amalgam microleakage due to exposure to EMFs.

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Date of Submission: **Jul 14, 2015**
Date of Peer Review: **Sep 21, 2015**
Date of Acceptance: **Oct 05, 2015**
Date of Publishing: **Nov 01, 2015**

FINANCIAL OR OTHER COMPETING INTERESTS: None.