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Electromagnetic Exposure and Mercury Release from Dental Amalgam: Insights from Dr. Ghazal Mortazavi's Research

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Background: Dental amalgam remains widely used due to its durability and cost-effectiveness, yet it contains elemental mercury, a neurotoxic substance that may leach under certain environmental conditions. Dr. Ghazal Mortazavi has made significant contributions to understanding how electromagnetic fields (EMF) and radiation—including X-rays, Wi-Fi, and MRI—affect mercury release from amalgam fillings.

Objective: To synthesise and present the key findings from Dr. Mortazavi's interdisciplinary studies on the impact of electromagnetic exposure on mercury release and its potential health implications.

Methods: Dr. Mortazavi and collaborators conducted a series of in vivo, ex vivo, and in vitro studies involving controlled exposures of dental amalgam to mobile phone radiation, MRI scans (1.5T to 7.0T), Wi-Fi (2.4 GHz), and diagnostic X-rays. Mercury levels were measured in urine, saliva, and artificial media using cold vapour atomic absorption spectrometry.

Results: Across multiple studies, electromagnetic exposure resulted in a statistically significant increase in mercury release. For example, 15-minute daily exposure to mobile phone radiation elevated urinary mercury levels from $2.43 \pm$

$0.25 \mu\text{g/L}$ to $4.5 \pm 0.32 \mu\text{g/L}$. MRI exposure (1.5 T, 15 minutes) similarly raised urinary mercury from 20.70 to 24.83 $\mu\text{g/L}$ over 72 hours. Wi-Fi and X-ray exposures also demonstrated enhanced mercury release in dental models.

Conclusion: Dr. Ghazal Mortazavi's research provides compelling evidence that short-term electromagnetic exposures can accelerate mercury release from dental amalgam fillings. These findings have significant implications for patient safety, especially among vulnerable populations such as pregnant women and children. Her work underscores the need for further research, public health guidance, and reconsideration of amalgam use in clinical dentistry.

Biography

Dr. Ghazal Mortazavi is a dentist who graduated from Shiraz University of Medical Sciences. Her research work has predominantly focused on the effects of exposure to electromagnetic fields on periodontitis, a severe gum inflammation/infection that can lead to tooth loss and other serious health complications. Her findings on animal models have paved the way for the development of new therapeutic strategies for the treatment of periodontitis. Additionally, she has conducted several experiments on the role of EMF in increasing the release of mercury from dental amalgam fillings and the microleakage of this restorative material. Dr. Mortazavi has published over 50 papers in peer-reviewed journals.