عنوان مقاله:

A Review of the Requirements and Hazards of Toxic Metals From Orthodontic Wires

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خلاصه مقاله:

Background: Orthodontics is a part of dentistry that comprises preventive methods and correction of dental irregularities that need to be repositioned by functional and mechanical tools to provide an ideal occlusion and a beautiful face for patients. There are currently four metal archwires used in orthodontic treatment: stainless steel alloy, cobalt-chromium alloy, nickel-titanium alloy, and beta-titanium alloy. Toxic effects generally occur when the body's tissues are exposed to sufficient amounts of metal ions for long periods. Objectives: The present study briefly reviews the requirements and hazards of toxic metals from orthodontic wires. Methods: This study is a review of the available reliable sources and reference documents and scientific-research articles published in the international journals and databases with the focus on the requirements and hazards of toxic metals from orthodontic wires. Results: Optimal characteristics of an archwire for optimal performance are spring return, ductility, modulus of elasticity, biocompatibility, and low friction. The release of metal ions from dental alloys is due to local and systematic chemicals, mutagenic, immunogenic, and toxic effects. Conclusion: Today, most orthodontic brackets, braces, and archwires are made of stainless steel and nickel-titanium, all of which contain varying amounts of nickel, chromium, and cobalt ions. Increasing the amount of ions released from orthodontic alloys causes a cytotoxic state for the body. Although orthodontic alloys contain anti-corrosion agents, they are prone to corrosion in dynamic oral environments.

کلمات کلیدی:

Orthodontic appliances, Orthodontic wires, Metal ions release, Toxic metals, Saliva, Orthodontic treatment