

Invitro Evaluation of Cytotoxicity and Elemental Release of Three Types of Nickel – Chromium Basemetal Alloys and Compare it With one Type of High Noble (Gold-Palladium- Silver) Alloy

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Introduction:

Dental alloys have a close contact to oral tissues. Following the corrosion phenomenon the possibility of changes in surrounding tissues will exist. Due to different applications and suitable properties, dental alloys are very useful, because of close relationship to restorative dentistry between alloys and tissues; they should be biocompatible & should not be cytotoxic. Base metal alloys are used in construction of prostheses frequently and are manufactured in Iran as well. [1, 2] The purpose of this study was to investigate cytotoxicity of three types of nickel – chromium base metal alloys (Wirron 99, Minalux, Supercast) with one type of High noble alloy (Degubond 4) on mouse fibroblast Cell (L 929). [1, 2, 6]

Material and Methods:

In experimental study, 12 disks of each alloy with 5mm diameter and 2.5 mm thickness were prepared and placed in RPMI culture medium for 48 hours & 72 hours (extract medium). Then the extract mediums were diluted in two different dilutions of 200 μ l & 40 μ l and their cytotoxicity were evaluated by MTT assay and compare with two control groups consist of only culture media & culture media with Teflon. The amount of Nickel, chromium, copper, zinc & silver released from each alloys were measured by flame atomic absorption device.

Results and Discussion:

After 48 hours, no significant difference in cytotoxicity was found between samples and control groups ($P > 0.05$). After 72 hours samples were not significantly different from each other in cytotoxicity, but there was a significant difference between samples and control groups. There was no significant difference in cytotoxicity with two dilutions of 200 μ l & 40 μ l between samples. Maximum release of nickel and chromium were observed from Minalux, silver from Degubond and zinc from Supercast.

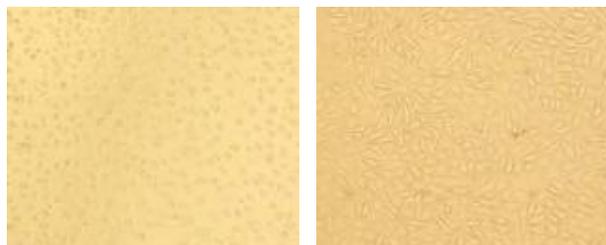
Conclusion:

The cytotoxicity of three Nickel-Chromium alloys and one high noble which were used in this study was not different. There was some degree of cytotoxicity when the time duration of contact between cells and samples were increased.



A. (culture media with Teflon) group

B. (Supercast)group



C. (Degubond) group

D. (culture media) group

The inverted microscopic pictures of L929 cells which treated by the extract liquid of Supercast, Degubond, culture media with Teflon and culture media MTT test ($\times 100$).

References:

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