

Effect of Stress on Metal ion Release in Saliva of Patients Treated with Fixed Orthodontic - A pilot study

Fariborz Amini¹, Hajir Rahimi², Saghar Harandi², Ryhaneh Hajrezaee², Sara Iramlo³, Fatemeh Baladi⁴

¹Associate Professor, Orthodontics Dept, Islamic Azad University, Dental Branch, Tehran, Iran

²Orthodontics

³Prosthodontics

⁴Specialist In Oral medicine

Abstract

Background and Aim: Corrosion of orthodontic appliances is influenced by changes in the saliva composition resulting from physiologic stress. This study was conducted to assess the effect of stress on the level of nickel (Ni) and chromium (Cr) ions in the saliva of patients treated with fixed orthodontic appliances.

Materials and Methods: Ten patients participated in this study. Saliva samples were collected at three different stages: T1: before placement of orthodontic appliances, T2: Three months after placement of fixed orthodontic appliances before stress, T3: 15 minutes after induction of stress (Trier Social Stress Test). Ion levels were measured by Atomic Absorption Spectrophotometry. Data were analyzed by ANOVA and post hoc Bonferroni statistical tests.

Result: Ni levels increased from 12.78 ± 5.26 in T1 to 14.9 ± 5.75 in T3 and this increase was statistically significant. ($P < 0.05$) Chromium (Cr) levels changed from 5.21 ± 3.38 to 6.27 ± 2.68 , and the changes were not significant ($P < 0.05$).

Conclusion: Stress significantly increases the release of Ni ions from orthodontic appliances into the saliva. Chromium levels of the saliva elevate gradually with time, however the change is not statistically significant.

Keywords: Orthodontic alloys, nickel, chromium, saliva, stress, Trier Social Stress Test.