**Evaluation of Metal Ion Release from Ti6Al4V and Co-Cr-Mo Casting Alloys: In Vivo and In Vitro Study**

**Abstract**

**Purpose:** The aim of this study was to evaluate the amount of ions released from

Ti6Al4V and Co-Cr-Mo alloys both in vivo and in vitro.

**Materials and Methods:** Twenty-one discs of each alloy were constructed and divided

into seven groups. Three specimens from each group were immersed in a

buffered saline solution over a period of 1, 3, 5, 7, 14, 21, and 28 days. Twenty-eight

participants were also included in the study, where the study group consisted of 14

mandibular partially edentulous patients, and the control group consisted of 14 volunteers.

The study group was further divided into two equal groups: the first group

received removable partial dentures (RPDs) constructed from Co-Cr-Mo alloy, while

the second group received RPDs constructed from Ti6Al4V alloy. Saliva sampleswere

collected from each participant over the same study period. The conditioning media

and saliva samples were analyzed using a spectrophotometer. One-way ANOVA and

Tukey tests were used for statistical analysis (*p <* 0.05).

**Results:** The concentrations of metal ions released from the studied alloys were

significantly higher in the in vitro than in the in vivo study group during the followup

periods. A statistically significant increase in ion concentrations of the different

elements for both alloys was found with time (*p <* 0.05).

**Conclusion:** The amounts of released metallic ions from Co-Cr-Mo and Ti6Al4V

alloys were higher in the buffered saline solutions than in the studied saliva samples

and control groups; however, these amounts were still within the physiological limit

of trace elements in the human body.