Cytotoxicity of alginate for orthodontic use

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Editor's summary

Alginate, or irreversible hydrocolloid, is the most accepted impression material used in Orthodontics. Manufacturers aiming to produce alginates with characteristics important to the orthodontist, elaborate the orthodontic alginate powder with changes in its components. Many substances are added to these materials in order to improve their physical, chemical and mechanical properties causing concern regarding the toxicity of these materials. Thus, it is necessary to evaluate its cytotoxicity. Based on it, the authors of this article evaluated the cytotoxicity of three different alginates of orthodontic use in cell culture. Three different alginates were evaluated, divided into 3 groups: JCO (Jeltrate Chromatic Ortho), OP (Orthoprint) and CO (Carrex Orthotrace). Three control groups also participated: Positive Control (C+), constituted by the cell detergent Tween 80; Negative control (C-) PBS, and cell control (CC) where cells were not exposed to any material. After manipulating the materials according to the manufacturer's instructions, specimens were made using silicone rings. Next, they were immersed in Eagle minimum essential medium (MEM) for 2 min, in which was proceeded the removal of the supernatant and contact with L929 fibroblasts. After contact with the medium, the cells were incubated for 24 hours and added 100 ml of 0.01% neutral red dye. Again the cells were incubated for 3 hours until they absorbed the dye. After this period, the cells were fixed and viable cell counting was performed by using an spectrophotometer (BioTek, Winooski, Vermont, USA) at wavelength of 492 nm. The findings showed statistical differences between the group C + with all groups and between the C- and CC with the experimental groups JCO, OP and CO ($p < 0.05$). No statistical significance was observed between the group JCO, OP and CO and between groups C- and CC ($p > 0.05$). Regarding the cell viability, group C + presented lower viability following experimental groups CO, OP and JCO. With the completion of this work, the authors concluded that all evaluated alginates showed cellular cytotoxicity, with no statistical differences between them.

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