Abstract

Some dentists in the developing world have had the experience of patients repairing their own acrylic-based dentures using cyanoacrylate (CA) adhesive known as 'super glue'. This study evaluated the cytotoxicity of commercial CA adhesives when fully polymerized as well as the toxicity of substances released from CA adhesives after incubation of these materials for various periods of time. Toxicity was tested on cultured oral fibroblast cells. Dead cells found around the various CA-coated filter papers constituted inhibitory zones which varied from 200-1000 μm. These inhibitory zones persisted for 2 weeks, while oral fibroblast cell grew to approach the wax-coated filter paper, set as one of the controls. Cell viability testing using MTT and crystal violet staining methods came to a similar conclusion that polymerized CA-coated filter paper released substances that are toxic to cells, while wax-coated filter paper gave the same result as the control, cells without any tested materials. The crystal violet staining method was also used to investigate the cytotoxicity of various CA materials after incubation for 1,3,7 and 14 days and showed that CAs continued to release cytotoxic substances at about the same level for at least 2 weeks, even though their cytotoxicity was reduced to about 40% after incubation in culture media for 1 day. It can be concluded that if this adhesive is used for repair of broken dentures it wil release substances which are toxic to human oral fibroblast cells and these may persist for at least 2 weeks.

Keywords: Cytotoxicity, cyanoacrylate, oral fibroblasts, cell culture, MTT test, Crystal violet staining