OSC1: Assessment of Cytotoxicity of Microcrystalline Cellulose Reinforced Denture Base Resin

Amira Ali Abdel Rahaman Ali, Lee Wei May, Ian Charles Paterson, Jacob John
Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia

**Purpose:** Microcrystalline cellulose (MCC) of the oil palm biomass, with its remarkable reinforcing capability and low density has lately been used in the development of environmentally friendly polymer composites. It also enhances the mechanical properties of the polymers and has good aesthetic attributes. The aim of this *in vitro* study was to determine the cytotoxicity of acrylic denture base resin (DBR) material reinforced with oil palm based MCC in different concentrations.

**Materials and Methods:** The test specimens were divided into 3 groups comprising of three MCC reinforced poly methyl methacrylate (PMMA) at different concentrations and were compared with the conventional and commercially available high impact PMMA. Cylindrical samples measuring 5.0±0.2 mm in diameter and 3.3±0.2 mm in height were prepared according to ISO 10993-12 for all the 5 groups. Three samples (n=3) were prepared for each group. The effect of the specimens on the cell viability of normal human oral fibroblasts (NHOFs) was examined by MTT assay. Data were statistically analyzed by one-way ANOVA and Tukey’s test (p < 0.05).

**Results:** The cell viability results of all test groups were more than 90%. This demonstrated that exposure of NHOFs to eluates from polymer-MCC mixture did not promote cell death or any toxic effects, when compared to the conventional high impact DBR material, indicating non-cytotoxicity in all groups.

**Conclusion:** It can be concluded that correctly processed oil palm based MCC reinforced PMMA are not cytotoxic to NHOFs and are therefore safe for use as denture reinforced material.

**DOI:** 10.4103/0972-4052.244589