Miswak Reduces the Toxic Effect of Phenytoin

Younes, Dima (School: Dur Al-Manthur School)
Alkhalidi, Sara (School: Dur Al-Manthur School)

Phenytoin is a commonly used antiepileptic drug. Its effect on causing gingival overgrowth with a prevalence of 50%. This problem caries both hygiene and cosmetic impact on patients. The aim of this study is to examine the effect of Miswak extracts on fibroblast over-growth that is induced by application of phenytoin. Methods: The study was conducted in cell culture. Miswak sticks (128.6 g) were extracted using soxh extrator for one week. The extracted liquid was dried using rotavapor to obtain a concentrated extract of miswak. A stock solution was prepared by dissolving 27.3 mg of miswak extract in 5ml of DMM. After three days of seeding human fibroblast cells, cells were treated as follow: control (DMM only), phenytoin only (The concentrations were(100ug/ml, 50ug/ml, 25ug/ml, 12.5ug/ml, 6.25ug/ml) , , Miswak extract only (5.46 mg/ml stock, then using 75% of it, 50%, 25%). The last group was treated with both phenytoin (20mg/ml) and miswak extract in the following concentrations of (5.46 mg/ml stock: 100%, 75%, 50%, and 25%). The effects of the previous treatments on the cells was tested using MTT assay. Results Phenytoin caused toxicity to fibroblasts. There was a direct relationship between the concentration of the phenytoin used and the number of living cells toxicity. Miswak extract used alone caused minimal toxicity for cells, the 25% extract showed improved cells growth. When miswak and phenytoin were used together, miswak extract helped in decreasing the toxicity of phenytoin. Conclusions: Miswak extract has the potential in reversing fibroblast cell toxicity induced by phenytoin. Further studies are needed to determine the mechanism of this effect like studying the effect on miswak extract on the level of IL1ß and PGE2 production by HGFs.

Awards Won: