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Cytotoxic effects of diosgenin on human squamous cell carcinoma cell line: An in-vitro study

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Abstract

Background : Diosgenin, a furostanol saponin, is a major bioactive constituent in the seeds of fenugreek. Extracts of fenugreek seeds and some of their saponin constituents have been found to have anticarcinogenic potency in different settings.

Aims and Objectives: Estimate the anticancer effect of Diosgenin on squamous cell carcinoma cell line.

Methods: The HEp-2 human laryngocarcinoma cell line was utilized. Hep-2 cells were treated using 20, 40 and 60µM of diosgenin for 6, 18, 24 and 48 hours. The surface area and circularity of the nuclei were automatically measured and nuclear area factor (NAF) was calculated . The mean values of (NAF) of different concentrations compared to the control results at different intervals were assessed statistically. The DNA fragmentation assay was performed to monitor the effect of diosgenin treatment relative to time and concentration on DNA pattern.

Results: The cytotoxic effect of diosgenin on HEp-2 cells was in direct relationship with the concentration of diosgenin and the time of exposure. The mean NAF decreased progressively from 6 hours till 24 hours with different diosgenin concentrations but it showed an increase as the incubation time increased to 48 hours. With 20µM diosgenin concentration , the mean value of NAF decreased as the treatment time increased from 6 to 48 hours. The DNA laddering showed more obvious DNA fragmentation with diosgenin concentrations of 40µM and 60µM than 20µM.

Conclusions: The 40µM and 60µM diosgenin concentration caused an increase in the incidence of apoptotic criteria. However, 40µM diosgenin concentration after 48 hours showed more apoptotic changes than that observed with 60µM as evidenced by morphometric analysis.