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Antitumoral Efficacy of *Vitex negundo* in Oral Cancer: An *In vitro* Study

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Abstract

Background: Oral squamous cell carcinoma (OSCC) accounts for approximately 90% of all oral cancer cases. Cytotoxic chemotherapeutic drugs interfere with the replication and synthesis of DNA, promoting the death of cancer cells and normal cells as well. Researchers have extracted a number of bioactive substances including volatile oils, flavonoids, lignans, iridoids, and terpenes from the leaves, seeds, and roots of *Vitex negundo*. Anti-inflammatory, antioxidant, anticancer, and antibacterial properties are displayed by these bioactive substances. The present study proposed to establish the cytotoxic, apoptotic activity of crude ethanolic extract of *Vitex negundo* (VN) leaves on an oral cancer cell line.

Methods: The OSCC cell line was exposed to different concentrations of crude ethanolic extract of VN leaves and cisplatin for 24, 48, and 72 hours. The MTT assay was done to check for cell viability. IC_{50} was determined. The AO/PI assay for apoptosis was done at IC50 after 72 hours. Early and late apoptotic changes were observed in VN-treated and cisplatin-treated cells.

Results: In the human OSCC cell line, the percentage of viable cells decreased from 92.33 to 21.08 after 24 hours as the concentration increased from 20 µg/ml to 100 µg/ml. Cell viability decreased from 71.20% to 17.89% after 48 hours and from 61.40% to 14.75% after 72 hours. VN-treated cells were predominantly in the early stage of apoptosis with chromatin changes (yellow-green nucleus) as compared to cisplatin on AO/PI staining.

Conclusions: Crude ethanolic extract of VN leaves had similar cytotoxic and apoptotic efficacy to cisplatin on the OSCC cell line.

Keywords: apoptosis, cytotoxicity, oral squamous cell carcinoma cell line, *Vitex negundo*