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Genistein and Oxaliplatin Effects in Reduction of Cancer Stem Cells Activity in Oral Squamous Cell Carcinoma: An Experimental Study

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Abstract

Squamous cell carcinoma is one of the malignant diseases that affect the oral cavity worldwide. One of the theories regarding oral carcinogenesis is that tumor growth is dependent on cancer stem cells. Markers specific for these cells as CD44 have been investigated in hope of developing a deeper understanding for their role in carcinogenesis. Genistein, as chemopreventive agent, has been shown to suppress the growth of several tumors. Oxaliplatin is a chemotherapeutic compound that did show a range of antitumor activity. This research was carried out to study the effect of genistein, oxaliplatin either alone or in combination during experimentally DMBA induced hamster buccal pouch carcinogenesis using CD44 antibody as a marker. A total of 100 young Syrian hamsters distributed into groups as follows: 4 normal animals examined for the histology of the normal pouch mucosa and 96 animals divided into; group I, as a control group, in which pouches were painted with a heavy mineral oil only; group II were painted with DMBA mixed in a heavy mineral oil. These animals were randomly divided into 4 subgroups as following: group IIA only painted with DMBA; group IIB where genistein was orally administrated; group IIC were injected with oxaliplatin; and group IID in which both genistein and oxaliplatin were given. Both genistein and oxaliplatin provided a significant reduction in carcinogenesis process of DMBA induced oral squamous cell carcinoma. Moreover, they provided a significant decrease in the proliferation and activity of cancer stem cells as measured by the CD44 antibody. Genistein provides a chemoprevention role and the oxaliplatin produces a chemotherapeutic effect during the process of carcinogenesis. The combined action of both agents was better than the effect of each agent alone.

Biography

Ahmed M. Hussein Ali is a lecturer of Oral and Maxillofacial Pathology, South Valley University, Egypt. He attached his PHD degree from faculty of Dentistry, Alexandria University August, 2017. He has good command of histological analysis, pathological slide diagnosis, animal handling and teaching courses. Also has good command flow cytometry analysis, immunohistochemical preparation and scanning electron microscope.

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