IMMUNOHISTOCHEMICAL STUDY ON THE EFFECT OF GINGER ON COLON CARCINOMA IN MICE

BY

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ABSTRACT

Humans are naturally exposed to several carcinogenic materials such as, hydrazines, especially in food. Colon cancer is frequently a pathological consequence of persistent oxidative stress, leading to DNA damage and mutations in cancer-related genes. The present study was designed to verify the role of Ginger as anti-carcinoma of colon in mice treated with Azoxymethane (AOM).

Histological studies on colon of untreated mice (control) and animals treated by ginger indicated no alterations or any tumors in the colon tissues and glands. The crypts contained abundant goblet cells.

However, animals treated with the carcinogen, Azoxymethan (AOM), colonic mucosa exhibited various histopathological changes, ranging from hyperplasia to dysplasia. Many neoplastic crypts and glands appeared irregular in shape and size with a tendency to an exophytic growth.

Moreover, both treatments by ginger as pre & post (A&B groups) and post initiation (D group) with AOM, caused significant inhibitions of the carcinogenesis, depending upon duration of exposure time to ginger. However, the pre & post initiation appeared significant effects than the post. Histochemical examinations of the colon in control and mice treated with ginger, the acidic mucins were positively stained with Alcian blue. Conversely, the mucosa of AOM-treated mice showed faint and weak Alcian blue staining. The mucosa of treated mice b**y** AOM and ginger extraction showed an increase in the goblet cells staining ability**.**

Immunohistochemistry, evaluation of the PCNA, CEA and p53 indicators indicated that, in the mice of control and ginger treatments, the mucosal parts of the colon showed negative reactions. However, evaluation of the mentioned indicators in AOM treated mice revealed, positive staining in the mucosal cells of adenocarcinoma ($P<0.0011$, $P< 0.0001$ and $P< 0.006$, respectively). Both treatments with ginger as pre & post (A&B groups) and post (D group) initiation with AOM, caused significant inhibitions of the carcinogenesis, depending upon duration of exposure time to ginger. Concerning PCNA, P values were <0.008, >0.05 and <0.005 at the respective groups A, B and D. Regarding CEA, calculated P values were <0.0007, <0.00091 and >0.05, respectively. Also by estimation of p53, calculated P values were in respective, <0.009, >0.05 and <0.007.

Measurement of the DNA content by using the flow cytometer technique showed that mean percentage values of the G1-cells, the S-phase cells and the G2 cells, in respective were, 94.56%, 0.55% and 4.89% for control; 97.56%, 0.55% and1.89% for ginger treatment; 87.66%, 2.55% and 10.79% for AOM treatment. In (A & B groups), the respective values were, 47.66%, 2.55% and 50.79%; and 97.66%, 0.55% and 55%. On the other hand, at the group (D), the recorded values were, 27.66%, 11.55% and 60.79%, respectively.Using ginger appeared chemopreventive effect in colon carcinogenesis and exhibited as anti-neoplastic and anti-proliferated effects on carcinogen-exposed crypts.