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Immunohistochemical study of the effect of chamomile extract on 5- fluorouracil induced intestinal mucositis in albino rats

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Background & Objectives: 5-Fluorouracil (5-FU) is a commonly used drug for the treatment of malignant cancers. Approximately 80% of patients undergoing 5-FU treatment suffer from gastrointestinal mucositis. The aim of this study was to investigate the effect of chamomile extract on the pathogenesis of 5-FU induced intestinal mucositis in Albino rat.

Materials & Methods: In current study forty females Albino rats, weighing 220-280 g were used in the study. For the induction of mucositis, 60 mg/kg of 5-FU was administered intraperitoneally to each animal in the study group on day 0, and 40 mg/kg was administered on day 2. The control animals were intraperitoneally injected by normal saline in the same manner and dose like 5-FU on day 0 and 2. Then the rats in each group were randomly divided into two groups: Distilled water treated group and chamomile extract treated group (10 animals each). A volume of distilled water equal to chamomile extract was given by intragastric gavage tube, while the other group was gavaged with chamomile extract at a dose of (100 mg/kg) two times daily. The treatment with distilled water or the chamomile extract was initiated on day 5 and the experiment continues for twelve days. The body weight for each rat was measured and then the animals were sacrificed on day 8 and 12 (five animals each). In each experiment, one centimeter of proximal jejunum was removed for histopathological, intestinal morphometry, and immunohistochemical analysis using Ki-67 and Bcl-2 immunolabeling.

Results: Chamomile can protect the jejunum from fluorouracil-induced cytotoxicity and attenuate or decrease the associated injury. The chamomile in 5-FU/chamomile group causes significant increase in villi length, crypt depth, number of goblet cells, and Ki-67 and Bcl-2 immunexpression in comparison with 5-FU/water group at day 8. But longer duration of taking chamomile can cause cytotoxic and damaging effect to the jejunum.

Conclusion: Chamomile can protect the jejunum from fluorouracil-induced mucositis, it attenuates the associated injury if it's taken for short duration, but the reverse can occur if it's taken for longer period.

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