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Effect of soy bean on histomorphometric parameters of stomach and biochemical factors of blood serum in animal model

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Introduction & Objective: In the modern world, soy bean as a valuable meal is used for providing protein and some essential body needs. The stomach also as a part of alimentary canal has its own role in mechanical and chemical digestion. The objective of this study is evaluation of the effects of soy meal on histological and histometrical features of the stomach and also on biochemical factors of blood serum.

Methods: In this experimental study, a total of thirty immature female mice of Balb/C were selected at three weeks of age. Then on the basis of three types of diets, the mice were divided into three groups as; the group A or control, fed on a diet of full protein, the group B fed on a diet of 40% soy meal and the group C fed on a diet of 20% soy meal. After three months, the mice were anesthetized, and blood samples were obtained from the heart for determining the serum level of some hematologic factors such as urea, total protein, cholesterol and LDL. Then the stomach was removed, some tissue sections were prepared and stained with H&E. After histological study, the stomach was subjected to histometric evaluation. The histometric data were surveyed by a light microscope equipped with Axiovision software and the thickness of mucosa, submucosa, musculature, also depth of the pits and the number of parietal cells were measured. For data analysis, one way ANOVA was used to compare the control group with experimental groups and Tukey test was used to compare the groups with each other. The significance level was considered as P<0.05

Findings: Soya bean consumption didn't cause histological changes. In the more precisely histometric study, the results showed that in non glandular portion of the stomach, between the control group compared with the groups fed on soy meal, there was significant increase in thickness of mucosa in the experimental group B (676 ± 99.45) compared with the control group (427 ± 77.53) and also in thickness the muscular layers in the experimental group C)233.30±84.69) compared with the control group (104.05 ± 11.71), (P<0.05). In the glandular portion also significant increase in thickness of mucosa in the experimental group B (1041.36 ± 167.02) and C (1331.73 ± 143.32) compared with the control group (615.29 ± 83.14), in depth of pits in the experimental group B (134.53 ± 14.60) and C (154.29 ± 20.25) compared with the control group (94.79 ± 12.93), in parietal cells in the experimental group B (15.66 ± 4.45) and C (30.50 ± 13.61) compared with the control group (9.83 ± 1.47) and muscular layers in the experimental group B (15.66 ± 4.45) and C (195.72 ± 67.89) compared with the control group B (87.76 ± 20.53) and C (83.03 ± 16.06) compared with the control (117.70 ± 20.71), serum level of cholesterol in the experimental group B (36.23 ± 10.43) and C (40.58 ± 12.14) compared with the control group (65.33 ± 7.28) and also LDL value in the experimental group B (5581.6 ± 470.90) and C (5689.1 ± 479.79) compared with the control group (6907.1 ± 37.64) was observed (P<0.05).

Conclusion: It seems that long term consumption of soy bean could affect on the stomach mucosa and proliferation of parietal cells and also could decrease the serum levels of cholesterol, urea and LDL.

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