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Homocysteinemia; biological mechanisms, chemical analysis: The need to Folic acid and Betaine

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Abstract

Homocysteine (Hcy), the intermediate amino acid was discovered early in last century during the methionine metabolism. Elevation of plasma homocysteine has been gradually induced s.c. for male albino rats beginning from the 5th day and up to three weeks. Oxidative stress is one of the mechanisms proved to be a reason in injury for Hcy induction. Types of vitamin B as folic acid and betaine have been tested for decreasing the Hcy effects. Thirty rats were divided individually into 5 groups as follow; control, Hcy group, Hcy administration with low folic, Hcy with low folic and betaine, and Hcy with high folic concentration.

Hcy s.c. gradual administration system for groups 2-5 was (0.3, 0.4, and 0.6 µmol/g body weight) beginning from 5th day for one week, second and third week, respectively. In the first two weeks, group 3 was fed on basal diet mixed with 5.9 mg folic acid/kg body weight. While, group 4 diet was mixed with 5.9 mg folic acid and 30 g betaine/kg b.w. Group 5 diet as well was mixed with 250 mg folic acid/ kg body weight.

HPLC results should that Hcy with high folic has Hcy and folic concentrations; 0.05 & 1 µg/ml, respectively. By the end of the experiment, low folic proved significant decrease in total billirubin (0.49 mg/dl), and creatinine (0.37 mg/dl). High folic decreased significantly TG (123 mg/dl), MDA (8.9 nmol/ml), and urea (28.47 mg/dl). While, low folic with betaine showed significant decrease in GOT (23.35 units/ml, T. cholesterol (69.84 mg/dl, LDL (-6.38 mg/dl) and increased HDL (50.35 mg/dl). In histograms, betaine or high folic converted liver cerosis, normal spermatogenic series, and especially betaine showed normal kidney histological structure.