Effect of Soybean Flour, Coconut Oil and Magnesium on Rats Suffering from Non-Alcoholic Fatty Liver

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Abstract

The present research was conducted to study the effect of low-fat soybean flour, virgin coconut oil, magnesium and all of them on rats suffering from non-alcoholic fatty liver disease (NAFLD), through some nutritional and biochemical parameters, in addition to estimating the chemical composition of soybean flour and the fatty acids composition of virgin coconut oil which used in this study. Sixty adult male albino rats of the (Sprague Dawley) strain were used in this study. The rats were divided into two main groups. The first main group (12 rats) was divided into two subgroups: "subgroup one" (6 rats) fed on basal diet BD, while " subgroup two" (6 rats) fed on a basal diet containing low-fat soybean flour which provided the diet with 14% protein, these groups used as a control negative groups (-ve). The second main group (48 rats) fed on a high-fat diet (HFD) for 8 weeks to induce non-alcoholic fatty liver disease. Non-alcoholic fatty liver disease rats were randomly assigned to eight equal subgroups: Subgroup (1): fed on a high-fat diet (HFD) and used as a control positive group (+ve)1. Subgroup (2): fed on HFD containing all amount of protein from soybean flour and used as a positive control group (+ve)2. Subgroups (3 and 4): fed on HFDs containing all amounts of protein from low-fat soybean with replacing (10% and 20% coconut oil) instead of (10% and 20% sheep tallow), respectively. Subgroups (5 and 6): fed on HFDs containing soybean as the source of protein, these groups were supplemented with 500 and 1000 mg magnesium/kg diet, respectively. Subgroup (7): fed on HFD containing soybean as the source of protein with replacing 10% coconut oil instead of 10% sheep tallow and supplemented with 500 mg magnesium. Subgroup (8): fed on HFD containing soybean as the source of protein with replacing 20% coconut oil instead of 20% sheep tallow and supplemented with 1000 mg magnesium. The results indicated that treating NAFLD rats with low-fat soybean flour, coconut oil, and magnesium improved the nutritional and biochemical parameters by reducing (body weight gain %, liver weight%, glucose, leptin hormone, cholesterol, triglycerides, LDL-c, VLDL-c, AST, ALT, and ALP), and increasing HDL-c and antioxidant enzymes in the liver (GSH-Px, SOD,

and CAT), significantly. The best results recorded for the NAFLD groups which treated with HFD containing low-fat soybean flour as the source of protein with replacing 20% coconut oil instead of 20% sheep tallow and supplemented with 1000 mg magnesium/ kg diet.

Keywords: soybean - coconut oil - magnesium - high fat diet - non-alcoholic fatty liver - rats.