EFFECTS OF BUTYLATED HYDROXY- TOLUENE (BHT) ON BODY WEIGHT GAIN, BLOOD CRITERIA AND SOME SERUM ENZYMATIC ACTIVITIVES OF RATS.

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ABSTRACT

Groups of male albino rats were given butylated hydroxytoluene (BHT) as an antioxidant in a doses of 40, 80 and 160 mg /kg body weight orally , and compared with rats fed on control diet. Treated male rats showed significant reduction in body weight gain and decrease in each of number of the white blood cells (WBC), serum total protein, albumin/globulin ratio, serum phospholipids, triglycerides and sodium. In contrast, BHT treated male rats showed significant increase in number of red blood cells (RBC), serum transaminase activity (GOT and GPT), alkaline phosphatase(ALP), total cholesterol, creatine, urea and potassium level in serum.

INTRODUCTION

Phenolic antioxidants such as butylated hydroxy toluene (BHT), butylated hydroxy anisol (BHA) and propyl gallate (PG) play important roles in manufacturing, packaging and storage of fats and fatty foods. These compounds have undergone extensive toxicological evaluations (Lin *et al.*, 1981).

Kahl and Wulff (1979) have demonstrated that BHT induced the activity of enzymes associated with the mammalian hepatic microsomal mixed-function oxidase system (MFO). The antioxidant also induced cytochrome P-450 content in female rats consuming diets high in polyunsaturated or saturated fats (King and McCay 1981), decreased cytochrome P-450 reductase activity in rat liver microsomes (Rikans *et al.*, 1981).

Meyer and Hansen (1980) showed significant reductions in both body weight and weight gain in both male and female rats fed on diets containing BHT as compared to control ones. Olsen *et al.* (1986) found an increase in serum cholesterol, while total serum triglycerides was reduced in rats fed on diet containg BHT. They found also reductions in body weight and weight gain compared with the control animals .

Erythrocytes or red blood cells (RBC) are unique biological structures that contain high concentrations of polyunsaturated fatty acids, molecular oxygen and ferrous ions in the ligand state and sponataneously produced superoxide radicals (Clemens and Waller 1987).

Hirose *et al.* (1981) reported that, when BHT was fed at level of 0.25 or 1% to wister rats, serum triglycerides level in treated male rats was significantly lower than that in control while total cholesterol at the 0.25% of BHT level was higher ($P<0.05$) when compared with that of control. They reported also that, BHT significantly decreased serum albumin/globulin ratio and creatine phosphokinase and increased alkaline phosphatase, glutamic oxalacetic transaminase and glutamic pyruvic transaminase activities.

Butylated hydroxytoluene (BHT) at a high dose causes haemorrhagic death for male rats during 9-37 days. BHT decreased the vitamin K-dependent coagulation factors and changes platelet function, vascular permeability and the activity of the kallikrein-kinin system, but does not affect fibrinolysis or the classical complement fixation process(Takahashi 1987).

Yamamoto *et al.* (1995) revealed that, liver weight, hepatic cholesterol and hepatic microsomal lipid peroxidation were significantly higher in the BH-fed rats. Mc Farlane *et al.* (1997) fed rats on diets delivering BHT at doses of 0, 500, 750 and 1000 mg /kg body weight daily and found that the body weight of all doses levels fed rats were less than those of the control ones.

The present experiment is undertaken to throw light on the effect of BHT as an antioxidant on body weight, blood picture as well as blood analysis, kidneys and liver functions.

MATERIALS AND METHODS

Fourty male albino rats (at average weight 172 to 184g) were divided randomly into four groups each included 10 rats. The four groups of rats were given orally 0, 40, 80 and 160 mg. BHT/kg body weight daily for a period of 8 weaks.

The clinical manifistation and the effect of BHT on growth were recorded . Blood samples were collected week after week for the biochemical analysis. Numbers of both red and white blood cells were counted according to the method described by Wintrobe (1967). Haemoglobine (Hb) and packed cell value (PCV) were measured in blood according to the method described by Schalm (1975).