

The Effects of Short-Term Administration of Weight Reducing Herbal Drug (Mehzileen) on Serum Enzymes in Common Rabbits

Ruqaiya Hasan*, Aisha Javaid and Saqiba Fatima

Department of Physiology, University of Karachi, Karachi – 75270, Pakistan

Abstract: In the present study the weight reducing herbal drug, Mehzileen administered orally to common rabbits *Oryctolagus cuniculus* in a daily dose of 20 mg/ Kg body weight for 27 days. Blood samples drawn on day 0, 3, 7, 10 and 27 respectively were used to measure serum enzymes Aspartate Amino Transferase (AST) and Alanine Amino Transferase (ALT). Both the enzymes showed reduction in the early period of drug administration then started to elevate from day 10 of treatment. However AST remained significantly lower ($p < 0.05$) in test animals, while ALT continued to rise with slightly lower levels than initial concentrations at the end of experiment. These alterations in the AST and ALT levels suggest that major ingredients of the herbal drug used, probably interfere the metabolic activities of liver parenchyma and hepatocytes respectively.

Keywords: Herbal drugs, obesity, liver enzymes, weight reduction.

INTRODUCTION

Obesity is a condition where the natural energy reserves, stored in fatty tissues of human and animals are elevated to impair the health. Excess energy input occurs only during the developing phase of obesity [1]. It is a serious illness that can lead to many medical complications like high blood pressure, diabetes, abnormal blood fats, coronary artery disease, stroke, osteoarthritis, sleep apnea, cancer, fatty liver disease, gallbladder disease and gout [2-4].

The non-pharmacologic approaches for weight reduction include diet, exercise and behavioral treatment. Many studies demonstrate that obese adults can lose weight about 0.5 kg per week by decreasing their daily intake to 500 to 1000 k cal. below the caloric intake, required for the maintenance of their current weight [5]. Severe caloric restriction increases the rapidity of weight loss, but not the rate of long-term success in maintaining a reduced weight [6]. In addition to caloric restriction, exercise is most likely to promote the long-term maintenance of reduced weight [7-9]. Persons who combine caloric restriction and exercise with behavioral treatment may expect to lose about 5 to 10 percent of pre- intervention body weight over a period of four to six months [5, 10, 11]. Drug therapy is a pharmacologic approach for the treatment of obesity and to treat obesity, medications were proposed as short-term adjuncts for patients who reach "ideal body weight", and maintain a reduced weight indefinitely. Such short-term approaches proved unsuccessful [12].

Nowadays many herbs are being used for the treatments of obesity and weight loss is found evident in people using herbal products [13-16]. Research has suggested that cayenne pepper in the diet may help people to lose weight [17-20]. Green tea may support in a weight loss program by increasing energy expenditure or by inhibiting the digestion of fat in the intestine [21-23]. The ability of yohimbine to stimulate the nervous system [24] and promote the release of fat from fat cell, has led to claim that it might help weight loss by increasing metabolic rate, reducing appetite or increase fat burning [25, 26]. The herb guarana contains caffeine, which elevates the metabolic rate and has stimulatory effect on central nervous system [27].

Presently many herbal drugs of different combinations are commercially available, claiming their immediate efficacy in the management of obesity without any side effects. Although these products may successfully reduce, the body weight but the sufficient data on their side effects of the interactions of their ingredients are not available.

The objective of this study is to investigate the adverse effects of weight reducing herbal drug, MEHZILEEN on liver of common rabbits *Oryctolagus cuniculus* by measuring the changes in serum enzymes Aspartate Amino Transferase (AST) and Alanine Amino Transferase (ALT).

Drug Information

The herbal weight reducing drug MEHZILEEN (Azeemi laboratories, Karachi) used in this study has ingredients; Ajwain (*Ptychotis ajowan*), Caraway (*Carum carvi*), Fennel (*Foeniculum vulgare mill*),

*Address corresponding to this author at the Department of Physiology, University of Karachi, Karachi-75270, Pakistan; Tel: 03002521736; E-mail: ruqaiya55@gmail.com

Fennel flower (*Nigella sativa*), Mugwort (*Artemisia vulgaris*), Pennyroyal (*Mentha pulegium*), Rue (*Ruta graveolens*) and Worm wood (*Artemisia absinthium*). All of these ingredients are medicinally important due to their physiological effects, specially on digestive system as well as for the treatment of obesity [28-35].

MATERIALS AND METHODS

Animals

Eight rabbits (*Oryctolagus cuniculus*) used in this experiment, 12 months old, ranging from 1500-1550 g, purchased from local supplier. They kept in well-ventilated barred cages, placed in the departmental animal house. Clean, healthy and controlled conditions (temperature 35 ± 3 C°) at 12 hour day/ night cycle were maintained throughout the experiment. Animals fed *ad libitum* with their normal diet including alfalfa grass, cabbage, carrots and cucumber alternately for about one month prior to the start of experiment. Later they divided equally in control and test groups for comparative study.

Drug

The selected weight reducing herbal drug MEHZILEEN (Azeemi Laboratories, Karachi) available in tablet form, was purchased from a local chemist. Each tablet of 375 mg recommended for obese or overweight persons in a dose of 2 tablets morning and evening for 4 – 6 weeks. The calculated daily oral dose for experimental animals was 20 mg/ Kg body weight. The drug was given orally daily to each test animal for approximately 4 weeks.

Blood Sampling

To find out the changes in the selected parameter after administration of drug, blood samples drawn on day 0, 3, 7, 10 and 27 respectively by 3cc disposable

syringes from the marginal vein of ears of each rabbit. In order to obtain serum, the whole blood samples allowed to coagulate at room temperature for 1 hour and after centrifugation, supernatant was collected in eppendorf tubes to be refrigerated at 4°C.

Biochemical Analysis

In serum the enzymes AST and ALT were measured according to the method of Reitman et al., [36] using commercially available biochemical kits (Randox, Cat. No. AS147,AL146) on day 0, 3, 7, 10 and 27. Absorbances were read on spectrophotometer. The data was analyzed statistically by t-test and two-way ANOVA.

RESULTS

AST

The mean serum AST level in control rabbits remained almost constant i.e. in between 26.0 ± 0.55 IU/ l to 25.0 ± 0.57 IU/ l from day 0 to day 27. On the other hand test animals with mean AST level of 29.0 ± 0.53 IU/ l on day 0, showed a rapid fall from day 3 to day 10 (Figure 1a) with mean AST concentration of 7.0 ± 0.01 IU/ l in tests. From day 10 onwards, after the administration of drug, AST levels tend to rise but did not attain the initial concentration. The fall of AST concentration and then rise to lower than normal levels in test animals is significantly ($p < 0.05$) depending on the duration of drug administered.

ALT

The significant reduction ($p < 0.05$) in mean ALT concentration from 24.47 ± 0.38 IU/ l to 4.95 ± 0.70 IU/ l was observed in test rabbits from day 0 to day 10. While control rabbits showed a fall of 1.0 ± 0.07 IU/ l i.e. from 25.0 ± 0.58 IU/ l to 24.0 ± 0.51 IU/ l during this period. Following the administration of drug, from day

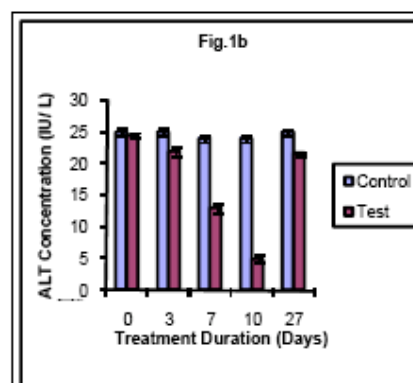
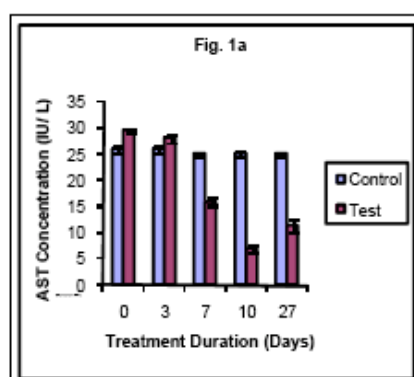


Figure 1: Comparison of mean serum enzyme concentrations in control and test rabbits.

10 onwards mean ALT concentration in test animals began to rise towards the initial levels (Figure 1b) and the mean ALT concentration in test rabbits were 21.53 ± 0.38 IU/l on day 27.

DISCUSSION

The weight loss can be achieved by the use of medications or herbs, which either decrease the appetite or involving digestive system by inhibiting the absorption from the intestine [37, 38].

However, herbal weight reducing drugs are not completely safe and free of adverse side effects as the cases of liver injury [39] and acute hepatitis associated with herbal dietary supplement for weight loss have been reported [40].

AST and ALT levels are reliable indicators of liver function as both enzymes are present in relatively higher concentrations in liver parenchymal cells and hepatocytes respectively. After the damage of cells, enzymes leak out into the blood [41]. Any medication can alter liver enzyme levels [42] such as low levels of AST or higher levels of ALT caused by herbs and natural products.

In the present study, the significant lower levels of serum AST and ALT on day 10 after the administration of drug, suggest the effects of ingredients of herbal drug involving liver [43]. These observations are supported by a study on *Ruta graveolens* toxicosis in goats, indicating the pathologic changes in various organs in addition to abnormal alterations in serum AST, cholesterol, the concentration of tissue calcium and phosphorus [44].

As the experiment was run for short duration, the gradual rise in ALT concentration would be significant if treatment continued for longer period, possibly damaging hepatocytes.

So far, there are little evidences that any of the available weight loss products would be effective, unless extra calories utilized by regular exercise and energy restriction by dietary modification. Further, the herbal drugs should be use by the consultancy of a person with sound knowledge of herbs and their side effects.

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