

THE EFFECTS OF WEIGHT REDUCING HERBAL DRUG (MEHZILEEN) ON THE LIPID PROFILE OF RABBIT *ORYCTOLAGUS CUNICULUS*

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ABSTRACT

This study deals to investigate the effects of weight reducing herbal drug Mehzileen on blood lipid profile of common rabbits. An oral daily dose of 30mg administered to test animals for 27 days. Blood samples drawn on day 0, 3, 7, 10 and 27 showed a significant ($p < 0.05$) reduction in plasma cholesterol and HDL-Cholesterol concentrations from their initial levels of 71.93 ± 1.03 mg/dl and 21.02 ± 0.40 mg/dl to 41.23 ± 0.78 mg/dl and 11.19 ± 0.95 mg/dl respectively, whereas plasma LDL-Cholesterol showed a reduction in the early period of experiment. A non significant fall was observed in plasma triglycerides concentration.

Key words: Lipid profile, Mehzileen, Obesity, Weight reduction

INTRODUCTION

Obesity has been defined as a weight more than 20 % above what is considered normal (Seeley *et al.*, 1996; Lovinger, 2002). It is a serious illness that can lead to many medical complications such as; diabetes, hypertension, certain cancers, degenerative arthritis, hypercholesterolemia, gall stones, heart attacks, strokes, sleep disorders and gout (Myers, 2004). A few non pharmacologic approaches for weight loss are diet, exercise and behavioral treatment.

Many studies demonstrate that obese adults can lose about 0.5 kg per week by decreasing their daily intake from 500 to 1000 kcal., below the caloric intake required for the maintenance of their current weight (Wadden and Foster, 2000).

Adding exercise to caloric restriction minimally increases weight loss during the acute phase of weight loss. It appears to be the component of treatment that is most likely to promote long-term maintenance of a reduced weight (McGuire *et al.*, 1999; Geliebter *et al.*, 1997).

Persons who combine caloric restriction and exercise with behavioral treatment may expect to lose about 5 to 10 per cent of preintervention body weight over a period of four to six months (Wadden and Foster, 2000; Poston *et al.*, 2000).

Drug and herbal therapy are also used as pharmacologic approaches for weight loss. In drug therapy, the medications for the treatment of obesity were proposed as short-term adjuncts for patients who reach "ideal body weight", and maintain a reduced weight indefinitely, although such short-term approaches proved unsuccessful with the history of many ill-fated weight loss regimes (Bray and Greenway, 1999). Weight loss medications should be used in addition to diet, exercise and other lifestyle modifications (Bell *et al.*, 1995).

In herbal therapy herbs may be helpful for the treatment of obesity. Research has suggested that cayenne pepper in the diet help people to lose weight (Yoshioka *et al.*, 2001). Green tea may support a weight loss program by increasing energy expenditure or by inhibiting the digestion of fat in the intestine (Dullo *et al.*, 2000; Juhel *et al.*, 2000). The ability of yohimbine has led to claim that it might help weight loss by raising metabolic rate, reducing appetite or increase fat burning (Kucio *et al.*, 1991). Bitter orange is known to promote weight loss (Colker *et al.*, 1999). The herb guarana has stimulatory effect on central nervous system, increases metabolic rate and a mild diuretic effect (Leung and Foster, 1996).

A large number of people whether obese or having normal weight, use non prescribed weight lose products, because advertising has dramatically increased the sales of products for weight lose (Blanck *et al.*, 2001).

The goal of this study was to observe the short term mono therapeutic effects of commercially available herbal weight reducing drug popularly known as Mehzileen on plasma cholesterol, triglycerides, HDL-cholesterol (HDL-C) and LDL-cholesterol (LDL-C) in common rabbits (*Oryctolagus cuniculus*). These rabbits represent one of the most important mammalian species used extensively in medical research and for testing the safety of chemicals (Banks, 1989; Nowak, 1999). The systemic physiology and lipid profile of both humans and rabbits are quite similar.

MATERIALS AND METHODS

The common rabbits (*Oryctolagus cuniculus*) of 12 months old weighing 1480-1570g, were obtained from local market. The animals were kept in well ventilated barred cages. All eight rabbits were fed on normal diet for about 1 month before the start of experiment. Five rabbits were kept as test and three as control.

Drug Information and Medicinal Importance of Plants

Mehzileen (Azeemi laboratories, Karachi) is a weight reducing herbal drug commonly used in Ayurvedic medicine. Its ingredients are; Ajwain (*Ptychotis ajowan*) helps against diseases of the digestive tract and fever; Caraway (*Carum carvi*) has stimulant and carminative properties, is used as carminative cordial and recommended in dyspepsia and symptoms attending hysteria and other disorders; Fennel flower (*Nigella sativa*) considered as stimulant, diaphoretic and emmenagogue, is also used as a corrigent or adjuvant of purgative and tonic medicines, as a carminative in indigestion and bowel complaints; Penny Royal (*Mentha pulegium*) has carminative, stimulant and emmenagogic actions; Rue (*Ruta graveolans*) is a strong stimulant, antispasmodic and as an emmenagogue; Mugwort (*Artemisia vulgaris*) has stimulant and slightly tonic properties, and is of value as a nervine and emmenagogue, having also diuretic and diaphoretic actions; Wormwood (*Artemisia absinthium*) has tonic, stomachic, febrifuge, antihelminthic, hypnotic, antitumour, carminative, stomachic, tonic effect on liver, gallbladder and digestive system, particularly helpful against the flatulence. It increases stomach acid and bile acid production for improving digestion and absorption of nutrients; Fennel (*Foeniculum absinthium*) is carminative and used as the domestic 'Gripe Water,' to correct the flatulence of infants (Greive, 1971).

DOSIMETRY

Mehzileen (Azeemi Laboratories, Karachi) is available in tablet form purchased from local chemist shop. Each tablet of 375mg recommended for obese persons in a dose of 2 tablets morning and evening. The daily oral dose of this drug calculated for the experiment was 30mg and administered to each test animal for 27 days.

BLOOD SAMPLING AND BIOCHEMICAL ANALYSIS

Blood sample was drawn from the marginal vein of the ear (Moreland, 1965) by 3cc disposable syringes using heparin as anticoagulant. After centrifugation for 5 minutes at 25000rpm (Model YJ03-043-4000) plasma was transferred in eppendorf tubes to be stored at 4°C in refrigerator and used for biochemical analysis on next day. Blood samples of all animals including tests and controls were collected on day 0, 3, 7, 10 and 27 respectively.

For the determination of lipid profile i.e. total cholesterol, triglycerides, HDL-C and LDL-C, commercial biochemical kits (Randox, Cat. No. CH 200, TR 1696, CH 203, CH 1350) were used. The absorbance of samples was read on photoelectric colorimeter (Model AE-11M ERMA INC.). Body weights of animals were also recorded at intervals. The collected data was analyzed statistically by performing t-test and two-way ANOVA (Zar, 1996).

RESULTS

Cholesterol

Controls showed a non significant reduction in cholesterol concentration i.e. 74.9 ± 0.31 mg/dl on day 27, however test animals showed a gradual fall in the cholesterol level from day 3 onwards after the daily administration of 30mg weight reducing herbal drug for 27 days (Fig 1). The significant reduction ($p < 0.05$) in the mean cholesterol concentration of test animals is about 43 % from their initial level and became 41.23 ± 0.78 mg/dl on day 27. Statistical analysis showed that this reduction in plasma cholesterol concentration of test animals is significant ($p < 0.05$), depending on the duration of drug administered.

Triglycerides

From day 3 to day 10 the mean triglycerides concentration in test animals following the administration of drug began to decrease non- significantly (Fig.2). On day 10 onwards the mean triglycerides concentrations of test animals attained a constant lower value of 53.23 ± 1.46 mg/dl, which showed a significant ($p < 0.05$) mean fall of 56 % from its initial level.

HDL-C

The mean plasma HDL-C concentration of control and test rabbits which were 23.68 ± 0.11 mg/dl and 21.02 ± 0.40 mg/dl respectively on day 0, remained almost constant up to the day 3 (Fig. 3). After the administration of

herbal drug, from day 3 the HDL-C decreased continuously in test animals. On day 27 test rabbits showed a significant ($p < 0.05$) fall of HDL-C levels, which was on average 46 % of its initial concentration.

Fig. 1

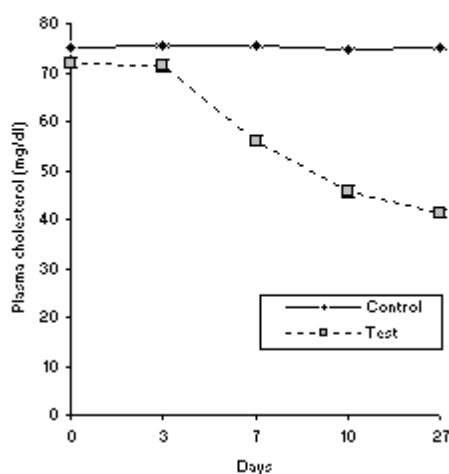


Fig. 2

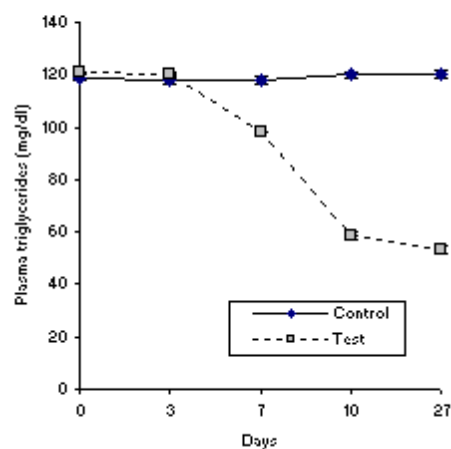


Fig. 3

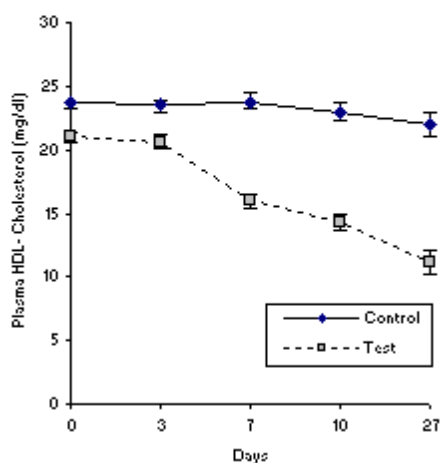


Fig. 4

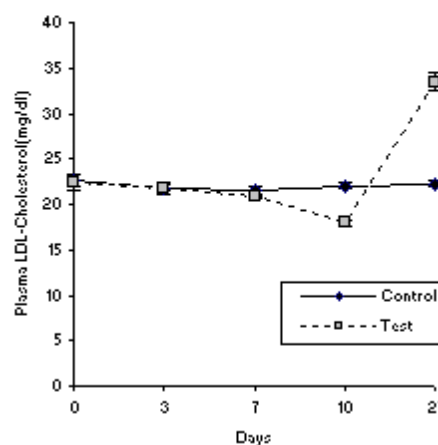


Fig.1-4. Comparison of mean plasma in control and test rabbits following the administration of 30 mg Mehzileen per day.

LDL-C

On day 0, the mean plasma LDL-C concentration of all rabbits including controls and tests were 22.66 ± 0.59 mg/dl and 22.33 ± 0.89 mg/dl respectively, remained constant up to the day 7 (Fig. 4). Afterward from day 7 to day

10, following the administration of drug, test animals showed a fall in mean LDL-C level, which again started to elevate and reached a maximum of 33.46 ± 0.99 mg/dl on day 27. The mean LDL-C concentration of test animals differ significantly ($p < 0.05$) from control and depending upon the duration of drug administered.

DISCUSSION

The analysis of data suggests that the weight reducing herbal drug used in this experiment, significantly ($p < 0.05$) affects the blood lipid profile of common rabbit (*Oryctolagus cuniculus*). The abnormal alterations in lipid profile are indicative of several metabolic disorders (Law and Wald, 2002).

The mechanisms of a herbal drug to reduce body fat and ultimately reducing the body weight are either decreasing the appetite and intestinal absorption with benefits on lipid profiles (Fanghanel *et al.*, 2000; Smith and Goulder, 2001) or increasing the satiety and metabolism (Girola *et al.*, 1996; Allison *et al.*, 2001).

Due to long term consequences of obesity on health, persons who are obese or having other obesity associated complications should use weight reducing drugs in combination with modified diet, behavior and exercise (Molnar *et al.*, 2000). In the present study the plasma cholesterol and triglycerides concentrations maintained at lower levels and show the effectiveness of the drug to prevent hypercholesterolemia. But on the other hand the gradual rise in LDL-C and a significant fall in HDL-C with the continuation of treatment, suggest that the drug is not completely free of side effects. The drug is a combination of different herbal ingredients which may contain active substances trigger side effects and interact with other herbs (Craig, 1999).

Since most of the ingredients of the herbal drug used in this study are stimulant, laxatives and diuretics in their mode of actions, may limit the intestinal absorption and increase the loss of fluid (Stanko and Arch, 1996) resulting in tissue wasting and temporary loss of weight without any loss in body fat. In addition there is a serious risk of electrolyte imbalance. Thus the herbal weight reducing drug should be taken with care and under prescription with good knowledge of botanical medicines.

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