Original Article

Study The Side Effects Of Administration Of A Traditional Product For Weight Gain In Albino Rats

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Abstract

The modern studies on the treatment of excessive thinness have dedicated on the potential activity of plants to increases appetite. The aim of this study is to investigate the effect of Puma as a weight gain product and nutritional supplement on body metabolism on its administers and determine its safety. 9 male rats were weighted (130 to 190 g) and divided equally into 3 groups, the first group considered as control group and administered distilled water, the two other groups divided into a single dose group and a double dose group. Administered the prepared aqueous solution of puma fat face pills for 30 days. The animals weighed after 24 hr. of the last administration. The results showed after weeks of treatment that the animals didn't gain much weight compared to control group and there were no beneficial effects of this product. AST & ALT levels was high in the single and double dose group also there is a change in the levels of creatinin while the urea level didn't change, the hisopathological study showed bleeding in kidneys and liver and more damage in these organs.

INTRODUCTION

Underweight is body weight that is too low for a normal healthy adult or child. It is also known by various other names such as wasting, emaciation, thinness, stunting, etc.(1) Body mass index (BMI),Which can be defined as the rati of the body weight (in kilograms unit) to height squared (in meters), is used to determinethe body weight status.(2) ages from 20 years and older, BMI is elabo-rated by using standard weight status Categories that are theequal for all ages and for both men and women. The standard weight status categories associated with BMI ranges for adults are: The un-derweight people who have BMI less than 18.5. Herbal products are those medicines (remedies) which derived from plants. Thesea products are largely used as supplements to improve health and well-being as well as for other therapeutic purposes. Herbal products are produced as capsules, tab-lets, powders, extracts, teas, and others. Remarkably, those products influenced the global and local herbal market as a result of the wide spread consumption (3). The herbal product industry is unde-niably a beneficial business in the world market today, with Asian countries such as China, India, Singapore, and Malaysia depend in some portion of total economic revenue generated from this industry. These countries and many others over a period of time have made great investments in their herbal research industries with the view of improving their overall economies (4,5). The ex-tant literature has shown that some herbal medicines may have adverse, even severe consequences, they are now in even greater demand in the developing world for use in primary healthcare. The natives of these countries use it not only because these substances are far less expensive, but also because these systems enjoy greater cultural acceptability, better compatibility with the human body, and bring on minimal side effects compared to non-herbal medicines and treatments. Simi-larly, most herbal products on the market today have received substantial attention from scholars and practitioners regarding the demand and usefulness of these products (6,7). The availability of plant products has been exploited with varying success to cure and prevent diseases throughout his-tory(8). Due to the side effects of some synthetic products, herbal products are gaining popularity in the world market and it has been noted that one major reason for their popularity and acceptabil-ity is the belief that all-natural products are safe (9,10). During the middle of the last century, the worldwide consumption pattern of herbal products has witnessed a noticeable Change. However, by extension, it is interpreted to mean that demand and use of herbal products have increased dramati-cally over time now with a projected increase in the coming years. Statistically, it has been report-ed that the global herbal medicine market size was valued at USD 71.19 billion in 2016 and is pro-jected to show a profitable or appreciable growth over the forecast period (11).

The product of (Puma Fat Face)

Puma fat face appetizing capsules, it's an mixture of herbs, vitamins B1, B2, B3and lutein. it is used as a treatment for the underweight problems and their complications. This product with un-known herbal substance, used to fatten the face and body and make it full and not just inflate it in a short period(as mentioned in the leaflet of the product). Various supplements have not been studied and need more investigation to conclude efficacy and determine if supplements users vary from non-users with respect to their health outcomes when controlling for differences in diet quality. Further principles on production and Marketing of these supplements would be needed.

MATERIALS AND METHODS

Animals

Nine males rats weighted (130 -190 gram) were obtained from Animal House in College of Sci-ence / Kufa University. These animals were kept under suitable environmental conditions of 20-25°C in an air-conditioned room and light period of 12 hours daily. The animals were housed in plastic cages of dimensions 20 × 50 × 75 cm and had free access to water ad-libitum. The animals were kept for one week for adaptation before beginning the experiment.

Experimental design

Nine rats were divided equally into 3 groups and Housed in 3 cages. The first group considered as control Group and administered distilled water, the two other groups daily administered the pre-pared aqueous solution of puma product pills for 30 days. The animals weighed before and after experience. The animals weighed after 24 hour of the last administration, then the animals were scarified, the blood samples obtained by heart puncture and the blood put in serum tube ,some or-gans were isolated for histopathological study, they include : Liver and kidneys, they were cleaned with normal saline then fixed with 10% formalin for24 hr. then put in 70% ethanol for preservation until histological preparations.

Preparation of aqueous solution of puma product

Each pill of puma product prepared for an average 70 kg human, This weight of pills component dissolved in 10 ml of N.S. to prepare stock solution, then 3 ml of it was taken (3 ml stock +100 ml N.S.) to prepare daily doses.

- Daily dose for single dose group is 1 ml (4 mg /kg) .
- And daily dose for double dose group is 2ml (8mg/kg).

Creatinine kit product with catalog number (Code No. BSIS13-I) was purchased from Spinreact (Spain). The current study follows all manufacturer's instructions. The assay is based on the reac-tion of creatinine with sodium picrate as described by Jaffé. Creatinine reacts with alkaline picrate forming a red complex. The intensity of the color formed is proportional to the creatinine concen-tration in the sample (12). Urea kit product with catalog number (Code No. BSIS135-I) was pur-chased from Spinreact (Spain). The current study follows all manufacturer's instructions. Urea in the sample reacts with o-fhthalaldehyde in acid medium forming a colored complex that can be measured by spectrophotometry: Urea + ofhthalaldehyde ⟶ H+ Isoindoline. The intensity of the color formed is proportional to the urea concentration in the sample(13). ALT kit product with catalog number (Code No. BEIS45-I) was purchased from Spinreact (Spain). The current study fol-lows all manufacturer's instructions. Alanine aminotransferase (ALT) or Glutamate pyruvate trans-aminase (GPT) atalyses the reversible transfer of an amino group from alanine to α- ketoglutarate forming glutamate and pyruvate. The pyruvate produced is reduced to lactate by lactate dehydro-genase (LDH) and NADH: The rate of decrease in concentration of NADH, measured photometri-cally, is proportional to the catalytic concentration of ALT present in the sample(12). AST kit product with catalog number (Code No. BEIS46-I) was purchased from Spinreact (Spain). The cur-rent study follows all manufacturer's instructions. Aspartate aminotransferase (AST) formerly called glutamate oxaloacetate (GOT) catalyses the reversible transfer of an amino group from as-partate to -ketoglutarate forming glutamate and oxaloacetate. The oxaloacetate produced is reduced to malate by malate dehydrogenase (MDH) and NADH: The rate of decrease in concentration of NADH, measured photometrically, is proportional to the catalytic concentration of AST present in the sample(12) . The histologic preparation were done according to Bancroft and Stevens (1982)(14). The prepared slides were examined with compound light microscope for study the his-tological changes

induced by the treatment and compared with control samples. The statistical analyses were carried out by using SPSS software (ver. 21.0). All

data were expressed as means ± standard deviation (SD). A statistically significant p-value wasde-fined as less than 0.05.

RESULTS

Weight

Figure 1 shows the change of animals weight after 30 days of experiment, the difference of weight reveals little change in the animals that administered the product in comparison with the control group. The changes of weight was statistitically nonsignificant P>0.05.

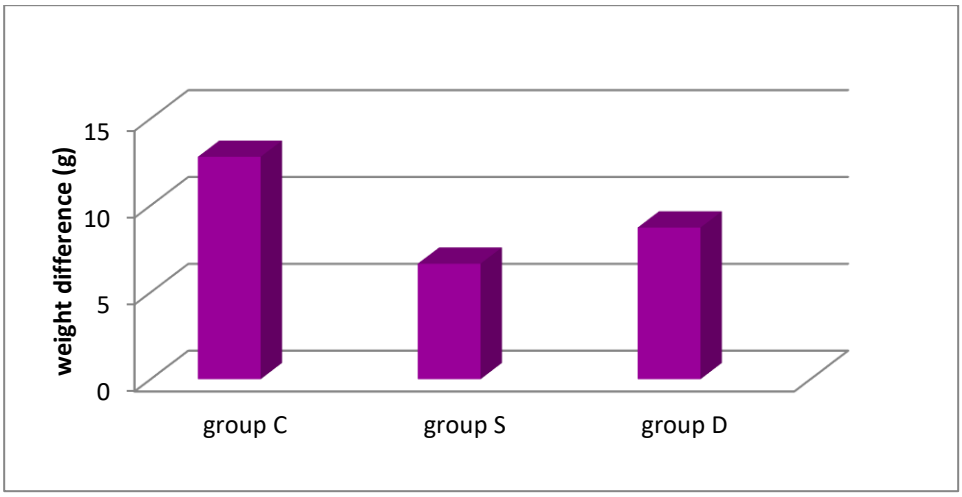

Figure 1: weight difference (g) in experiment groups

C: control, S: single dose, D: double dose

Physiological parameters

The results show that there is an increase in AST and ALT levels in S and D groups when com-pared with the control group but this increase does not reach to the significant level P> 0.05,(figure 2).

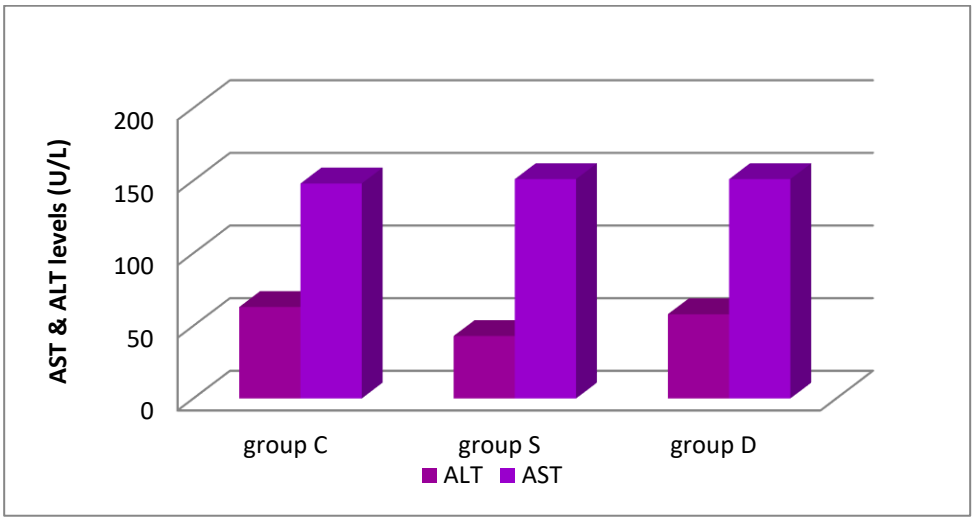

Figure 2: AST & ALT levels (U/L) in experiment groups

C: control, S: single dose, D: double dose

Also the result shows that there is no differences in urea levels among the studied groups. (figure 3).

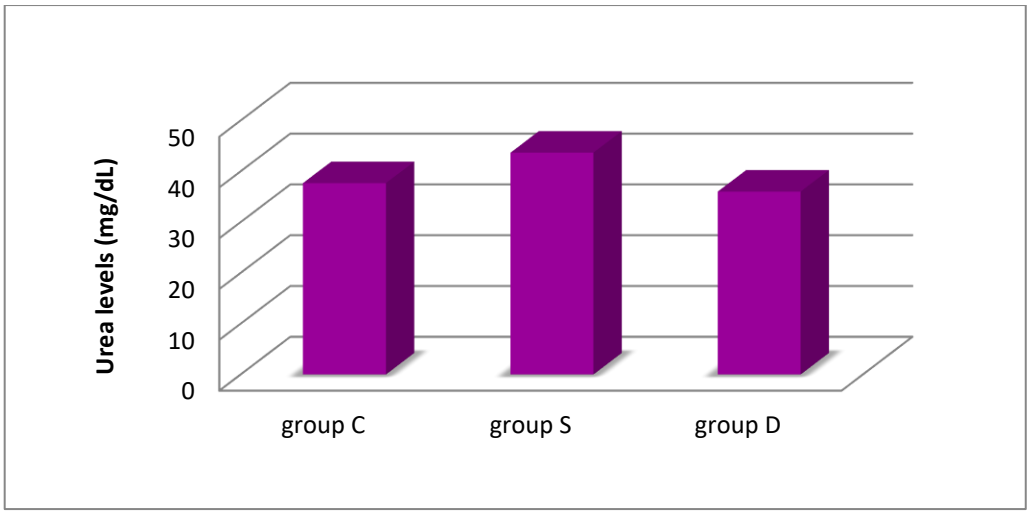

Figure 3: Urea levels (mg/dL) in experiment groups

C: control, S: single dose, D: double dose

There was a significant increase in creatinine levels in S and D group when compared with control group $P<0.05$,(figure 4).

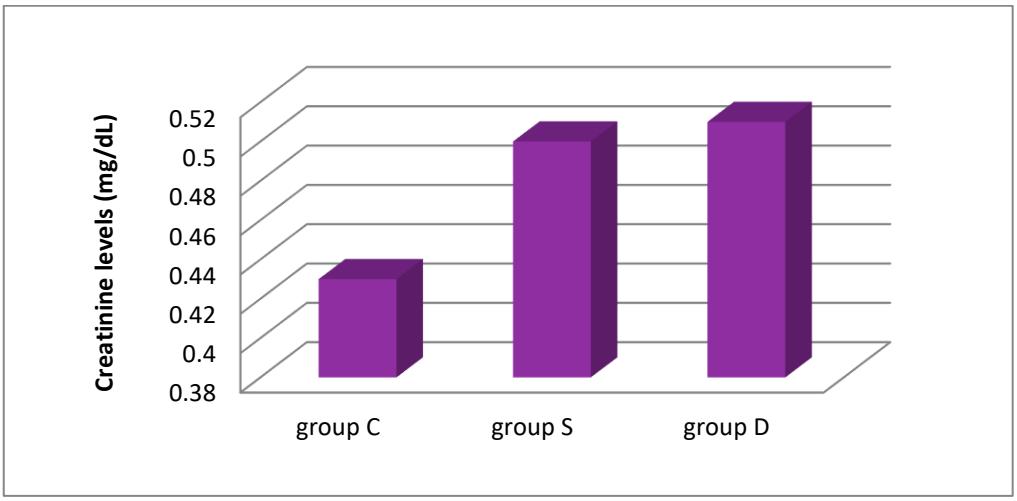

Figure 3: Creatinine levels (mg/dL) in experiment groups

C: control, S: single dose, D: double dose

Histolopathological study

The histological slides were prepared in a private histological unit in ALNajaf province. Results showed appearance of pathological changes in puma super fat treated animals in several organs, while the same organs of Control animals had normal tissues.

Single Dose Group : Glomerulus hypertrophy and bowman capsule with bleeding in near convo-luted tubule were seen in the kidneys of treated animals there were some observations in-clude:.(figure4)

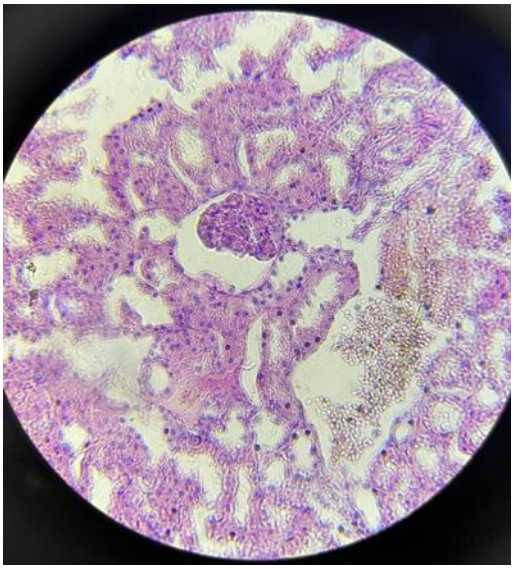

Figure 4: Kidney section of (Puma product) aqueous solution administrated rats(single dose). Hematoxylin eosin stain (400X)

The changes that occur on the liver for this group is : bleeding within central vein and lympho-cytes cluster around the central vein in some cells.(figure5)

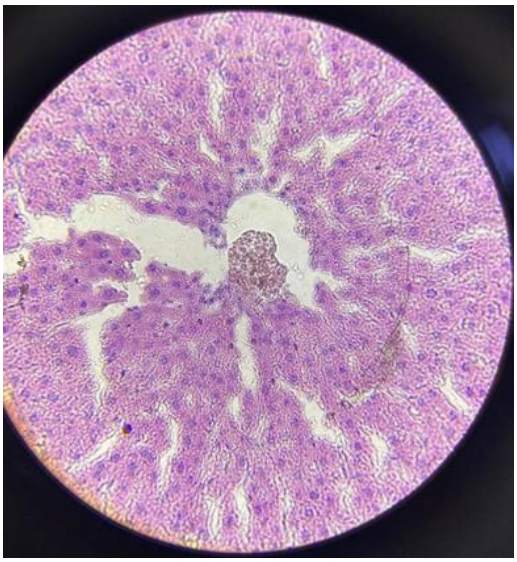

Figure 5: Liver section of (Puma product) aqueous solution administrated rats(single dose). Hematoxylin eosin stain (400X)

Double Dose Group: The changes that occur on the kidneys: glomerular hypertrophy and degener-ation, enlargement and dissolution of the glomerulus into two lobes.(figure6)

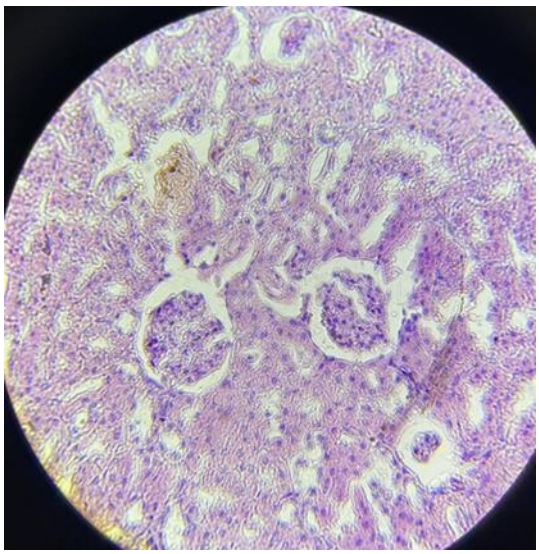

Figure (6) : Kidney section of (Puma product) aqueous solution administrated rats(double dose). Hematoxylin eosin stain (400X)

Changes occur on the liver for this group : bleeding within central vein.(figure7)

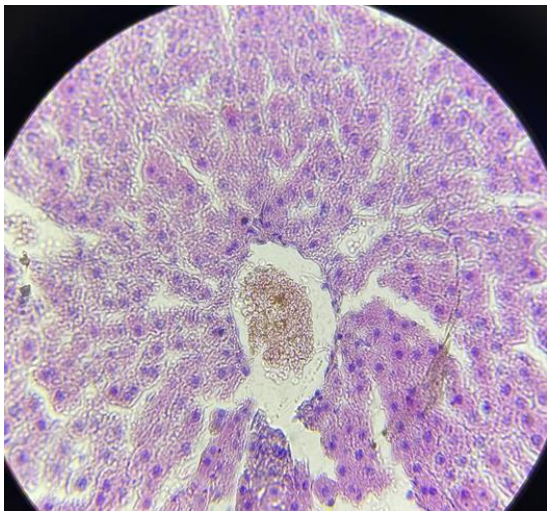

Figure (7) : Liver section of (Puma product) aqueous solution administrated rats(double dose). Hematoxylin eosin stain (400X)

DISCUSSION

It is believed that using herbal medicine for losing weight is not always safe. Moreover, for some herbal medicine the risk is sufficient to shift the risk-benefit balance against the use that medi-cine.(15). Unfortunately some people thinks that herbal medicines are safe. This case and review is about adverse complication of treating obesity with some herbal medicine.

An important demographic of natural health products users is serious, chronic, or recurrent medical conditions(16). In the current study we investigate an widely used herbal combination with a commercial name (puma fat face), this product used recently as a weight gain remedy. Our results showed appalling outcomes. Firstly, after week of treatment the treated animals loss weight in-stead of gain it ، after that there was a slight increase in their weight compared to the increase in control animals.!!! This results exposes that some commercial herbal products may give their bene-fits by psychological effect on patients which may induce consumer to rise their eating , so leading to weight gain. Secondly, there were no beneficial effects of this remedy AST & ALT levels high with significant change in creatinine level. Natural health products drug interactions can be pharmacodynamics or pharmacokinetic and may result in additive (synergistic) or opposing (antagonis-tic) effects. Pharmacodynamically the interaction between chamomile and warfarin, the effects of either product are changed due to the presence of the other, and a stable index of blood clotting, the INR, consequently was raised (17). Puma product or the nutritional supplement together affected the liver and led to histological and pathological changes. The effects were more severe at double doses, regarding the kidneys it was observed in the pathological tissue sections that there were his-tological changes in the glomerulus and Bowman's capsule where they were enlarged. Glomerulo-sclerosis and Bowman's capsule with hemorrhage in the proximal convoluted tubules. We didn't found a comparable study about this product. Besides the instruction leaflet of the product men-tions concentrations and the name of some vitamins used but not the type of herbs or what fat face substance means.

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