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Treatment of Hyperlipidemia Induced in Rats by Sweet Almond (S.A.) Watery Extract (*Prunus Amygdalus*) and Compares with Atorvastatin

***Mohammad S. Jadaan[1], Atheer A. Khashan[2], Omar Salim Ibrahim[3]**

[1]Department of Pharmacology, College of Pharmacy, University of Anbar, Anbar–Fallojah,964, Iraq
E.mail: Ph.mohamad88@gmail.com
[2]Department of Pharmacognosy, College of Pharmacy, University of Anbar, Anbar–Ramadi-HIT,964, Iraq
Email: ph.alatheernet@uoanbar.edu.iq
[3]Department of Pharmacology, College of Medicine, University of Anbar, Anbar–Ramadi,964, Iraq
E.mail: dr.osin1981@uoanbar.edu.iq

ABSTRACT

The purpose of this study is to discover the therapeutic effect of water extract of sweet almonds (Prunus Amygdalus) on certain hyperlipidemia-related biological indicators induced by rats, and compare it with atorvastatin, and then use electric milling the machine performs drying and grinding to form a course coarse powder of sweet almonds. Randomly divide 20 mature rats into 4 categories (5 mice in each group) and treat them daily for sixty days. The 1st group is fed and drunk normally and is considered as a positive control group, hyperlipidemia was induced in the other three groups. Two different doses (500 and 1000) mg/kg body weight of sweet almond water extract was used to treat hyperlipidemia in the second and third group and compared with another group treated with atorvastatin 0.3 mg/kg body weight. As a lipid-lowering drug.

Keywords: Sweet almond extracts, Atorvastati

Correspondence:
Mohammad S. Jadaan
Department of Pharmacology, College of Pharmacy, University of Anbar, Anbar–Fallojah,964, Iraq.
Email: Ph.mohamad88@gmail.com

INTRODUCTION

Cardiovascular disease is one of the main sources of death around the world (1). The development of these diseases is related to certain factors, such as smoking, unhealthy diet, age, lack of exercise, and genetic predisposition (2). These factors ultimately lead to lipid and lipoprotein digestion disorders, including overproduction and underproduction of lipoproteins (3) In addition to the genetic component that is the main driver of hypercholesterolemia, the type of food also contributes to its popularity. Since artifacts, hyperlipidemia diseases have affected humans. The World Health Organization believes that therapeutic vegetation is an acceptable pharmaceutical asset and should be studied in this way to understand its nature, efficacy and safety (4). The 1st -line in treatment of hyperlipidemia and lower lipid levels is atorvastatin.

The use of statins in hyperlipidemia treatment has become an important factor in the control of vascular diseases, this effect is related to the important mechanism of action of statins, such as the reduction of cholesterol (5).

MATERIALS AND METHODS

The water-containing extract (6) is used for extraction by a Soxhlet extractor, which is considered to be highly effective for the extraction of active ingredients of almonds. After that, rats were given different doses of gavage needles every day, divided into four groups: (1) Positive. control, hyperlipidemia was induced by adding 1% cholesterol to diet (7) and 0.5% H2O2 (8) in drinking water without treatment, group (2 and 3) induced hyperlipidemia and used Treated with sweet water extract (500 and 1000) mg/kg body weight of almonds for two months, group (4) induced hyperlipidemia, and atorvastatin was used at the recommended dose of 0.3 mg/kg body weight (Lipitor® treatment. Lasts for two months (9). At the end of the experiment, the rats were fasted overnight and then anesthetized. Blood was collected into EDTA with tube by cardiac puncture, and serum was separated by centrifugation at 2500 rpm for 10 minutes to detect lipid profile (TC, TAG, LDL-C, VLDL-C and HDL-C), in serum samples were analyzed by spectrophotometry (10).

RESULTS

The results of changes in blood lipids showed that during the 60-day period induced by hyperlipidemia, the serum concentrations of TG, TC, VLDL and LDL increased significantly, while the serum concentrations of HDL decreased significantly compared with the normal control group. Significant decrease after atorvastatin treatment as shown in Table (1), after 60 days of treatment, the blood concentration of TC, TG, VLDL and LDL increased.

Table 1: Compared with atorvastatin **(Lipitor)®**, the lipid profile test parameters of each group treated with sweet almond watery extract**.**

Parameter / Groups	TC Mg/dl	TG Mg/dl	HDL-C Mg/dl	LDL-C Mg/dl	VLDL-C Mg/dl
G1 Induced hyperlipidemia and not treated.	378.12±12.19 A	228 ±6.80 A	48.72±1.16 E	283.68±11.98 A	45.6±1.35 A
G2 treated with S.A. 500mg/kg B. W	275.88±11.8 D	145±7.28 C b	63.24±1.60 C a	181.72±8.78 D	30.97±1.45 C a
G3 treated with S.A.1000mg/kg B. W	187.1±18.94 F	104.88±7.45 D	70.92±1.05 A	94.17±18.61 F	21.3±1.48 D
G4 treated with atorvastatin (Lipitor)® 0.3 mg/kg B. W	238.56±5 E	137.2±5.48 C	68.52±1.08 A	141.48±4.83 E	27.45±1.3 B

DISCUSSION

In the current study, except for the control group, rats in all groups oral drinking water with 0.5% H2O2 and atherosclerotic diet 1% (w/w) cholesterol lasted for 60 days, causing hypertriglyceridemia and hypertension Oxidative stress caused by cholesterolemia, this result is similar to (11).

These results are consistent with previous studies, indicating that hydrogen peroxide is one of the reactive oxygen species that directly affects TC, TG and atherosclerotic lipoprotein levels. These results indicate that this may be due to dynamic changes during steroid absorption and exercise or a decrease in intestinal bile salts (12).

Treatment with sweet almond extract can reduce TC, TG and LDL-C levels and increase HDL-C (13). Hyperlipidemia can be reduced by S.A. effect because it has high quantity of unsaturated F.A. and minimum quantity of saturated F.A., and also contain phytochemical compounds with other compounds like calcium, copper and proteins. (14).

The dosage of sweet almond water extract (1000 mg/kg body weight) is considered to be the best way to treat hyperlipidemia. According to the results, the opinion of (15) shows that eating a small number of almonds has no harmful effect on blood lipids. With the control group. Current data show that atorvastatin treatment can significantly reduce serum TG, TC, LDL and VLDL levels, and significantly increase HDL serum levels, which is consistent with (16).

The inhibition of HMG-CoA reductase which is the main step in cholesterol formation by the atorvastatin lead to cholesterol synthesis disruption, all these changes may increase uptake of lipoproteins by LDL-C regulating liver receptors and reduce lipoprotein distribution. The overall effect of reducing fat includes improving the use and degradation of LDL-C, inhibiting the oxidative decline of LDL-C Cholesterol, the accumulation and esterification of cholesterol, and reducing the release of lipoproteins and the synthesis of cholesterol (17).

Sweet almonds contain compounds that have antioxidant properties and show this protective effect (18). The antioxidants effect of atorvastatin can minimize peroxidation of fat and ROS production, also it decreases lipoproteins sensitivity to oxidation, and they reduce LDL oxidation(19).

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