Effect of Ethanol Extract of Root Turnip (Brassica rapa) on Changes in Blood Factors HDL, LDL, Triglycerides and Total Cholesterol in Hypercholesterolemic Rabbits

1Hamide Mirzaie, 2Habibollah Johari, 1Mahmood Najafian, 1Hossein Kargar

1Department of Biology, Jahrom Branch, Islamic Azad University, Jahrom, Iran.
2Department of Biology, Darab Branch, Islamic Azad University, Darab, Iran.

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ABSTRACT

Background: The expression of myocardial infarction and cerebral atherosclerosis is responsible for most cases in the United States and Western Europe. Research shows that over the past decade in most countries the use of alternative therapies and especially herbal therapy and dietary supplements to improve a variety of illnesses, including high blood fat, has increased. Therefore, the aim of this study is to investigate the effect of different doses of turnip juice on blood lipid changes in hypercholesterolemic rabbits. Methods: In this study, 30 adult female rabbits produced 5 to 6 equal groups: control, sham 1, sham 2, and treatments 1, 2 and 3 respectively. Extract at doses of 100, 200, 400 mg / kg body weight of the rabbits in groups 1, 2 and 3 with 1 g/kg cholesterol and 1 ml/kg of corn oil to the was given as gavage. Cholesterol group 1 and group 2 sham group received the same amount of corn oil. Studies were performed on blood factors and body weight changes and test data by ANOVA (One-way analysis of variance) at a significant level (P< 0/01) was determined by using SPSS version 15. Results: The results for total cholesterol in all treatment groups and one sham group were significantly increased. LDL in groups 1 and 2, and 1 have seen a significant increase compared with control requirements. HDL in the treatment group and sham 2 is a significant increase. Triglycerides in treatment group 1 and sham 1 is a significant increase compared to the control group (P< 0/01) .The body weight of the animals in the treatment groups, sham 1 and 2 has been significantly lower than the control group. The results shows that the turnip root extract can probably little that can prevent the occurrence of atherosclerotic due to flavonoids and vitamins in it.

Key words: Turnips, Atherosclerosis, cholesterol, Triglycerides, Rabbits.

Introduction

Atherosclerosis is a disease in which slang "arteriosclerosis" is called. Therefore, identification and control of risk factors and triggers atherosclerosis is very important [1]. It also Atherosclerosis is a complex process that cannot be identified as a major risk factor for various factors, and other factors are involved [2]. The major risk factors can be dyslipidemia, events glycolizle and oxidative shock events that will increase cited [3, 4, and 5]. Atherosclerosis as an inflammatory disease where there is inflammation and the factors affecting it are also potential risk factors [6, 7]. Control of these risk factors is important in the prevention of atherosclerosis and present use of medicinal plants has been used to control risk factors [8]. Atherosclerosis, myocardial infarction, and stroke is responsible for the majority of cases in the United States and Western Europe [9]. The majority of these factors for heart disease - the disease accounts. Coronary heart disease, the leading cause of death in men 40 years and older and women 65 and older are in the United States [10]. About 50 percent of deaths are due to atherosclerosis [11]. The endothelial layer of the atherosclerotic fatty streaks in the arteries was seen [12]. Fatty streak lesion of atherosclerosis is the most common to occur at all ages [11]. English name and scientific name Brassica rapa Turnip Calipaean family Cruciferae is an old plant with rough leaves and cuts a lot of green, white, turnip, not only in terms of having a good vitamin and mineral properties [13]. Several investigations have been expressed in plants Brassicacea family are widely cultivated throughout the world and are used. The species Brassica rapa is an important varieties of turnip (Brassica rapa var rapa Turnip) [14]. Turnip biologically active compounds such as 1 - flavonoids (Flavonoids) including Isorhamnetin, Kaempferol and quercetin glycosides (Quercetin glycosides), 2 -
is derived phenylpropanoids [15], 3 - and 4 indole alkaloids – glycosides sterol 5 - ascorbic acid (139 mg) and vitamin A, niacin and riboflavin [16, 17]. An antioxidant property of phenolic compounds such as flavonoids is related to the turnip. Phenolic compounds with antioxidant destroying free radicals and inhibiting their actions, they will neutralize the potassium in fat turnips and arsenic that are directly involved in the formation of red blood cells and white. The sugar in the turnip neurons is strengthened. Also, vitamin A, B and C in the leaves and roots are well demonstrated role and it’s important to balance the nervous system and especially its nutritional balance. Turnip juice and dissolve kidney stones pass properties due to the effect on uric acid is dissolved facilitates. Turnip by its insulin-like effects in the treatment of diabetes is also used. Joint pain and joint pain caused from gout turnips also relieves [17]. Thus the importance of turnips and the importance of prevention and control of cardiovascular disease and where it has not yet done the research on the effects of changes in blood factors turnips LDL, HDL and triglyceride and cholesterol, the present study investigated the effect of different doses of turnips and reduce risk factors for cardiovascular disease are listed in hypercholesterolemic rabbits.

Methods:

In all of the research ethics of working with laboratory animals has been observed. A Wistar adult female New Zealand White rabbit weighing approximately 30 129 ± 2000 g from the center of Animal Breeding and maintenance of medical school was purchased. One week before the start of the experiment the animals were given a grace period to get used to the new environment and then test period began. An animal in experimental conditions, including temperature, 2 ± 22 ° C and 12 h light and 12 h dark cycle was used. Rodents used in food animals and food and water were free. Turnip extract the lethal dose LD50 was determined by the method.

Turnip Extract Preparation Method:

To prepare the turnip roots, turnip extract after drying using an electric mill and ground for use of sox let extraction (sox let), In this way, for every 10 grams of powder, turnip, 200 cc of solvent related to water and ethanol is added to make in sox let throw, and the solvent-assisted device Rota vapor extract from our [18].

The rabbits were randomly divided into 6 groups of 5.

Conditions imposed on these five groups are as follows:
- Control group: normal and no drugs were kept.
- Sham 1: 1 g /kg daily according to any of the rabbits was given gavage cholesterol.
- Sham 2: 1 ml/kg of body weight daily was given to them in the form of corn oil gavage.
- Group 1: 1 g/ kg daily of cholesterol with 1 cc of corn oil kg body weight and turnip extract at a dose of 100 mg/ kg body weight given as gavage.
- Group 2: 1 g/ kg daily of cholesterol with 1 cc of corn oil kg body weight and turnip extract at a dose of 200 mg/ kg body weight given as gavage.
- Group 3: 1 g/ kg daily of cholesterol with 1 cc of corn oil kg body weight and turnip extract at a dose of 400 mg/ kg body weight given as gavage.

In the end, all groups of rabbits were weighed after anesthesia, and blood samples were taken directly from the heart and serum was separated. The factors related to changes in HDL, LDL, triglycerides and total cholesterol were measured. To compare the effects of different doses of statistical analysis of ANOVA followed by Turkey's post hoc test was performed using SPSS software and the level of significance (P <0.01) were selected. Results of statistical analysis using Excel software results shown in Fig.

Results:

The study on the turnip extract on atherosclerosis by enhancing the rate of LDL according to the diagram (1) in sham 1 (cholesterol) and minimum mean-dose group increased significantly compared to the control group (P< 0/01) was revealed. Also in the (P< 0/05) as well as LDL levels in the sham group 2 and the treatment 3 group also significantly decreased compared with sham group 1.
HDL levels according to the diagram (2) in sham group 2 (corn) and all of the treatmental group showed a significant increase (P <0.01).

**Diagram 2:** Compare of HDL in treatments, shams and control groups (P <0.01).

Compare of TG in treatments, shams and control groups According to the diagram, (3) the level of serum triglyceride (TG) in sham group 1 and group minimum is a significant increase compared to the control group (P <0.01).

**Diagram 3:** Compare of TG in treatments, shams and control groups (P <0.01).

Total cholesterol according to the diagram (4) in sham group 1 and treatment group 1, 2 and 3 is a significant increase compared to the control group (P <0.01). In total cholesterol levels (P <0.05) in sham group 2 had a significantly decreased compared to sham group 1.

**Diagram 4:** Compare of CHO in treatments, shams and control groups (P <0.01).
According to the diagram (5) animal body weight in the treatments group, sham group 1 and 2 are significantly lower than the control group.

**Diagram 5:** compare of weight changes in treatments, shams and control groups (P<0.01).

**Discussion:**

In the present study, the treatments group, sham group 1 and 2, a significant decrease in the weight of laboratory animals has been achieved. In research conducted in the past stated that there was a positive association between leptin plasma cholesterol and triglycerides [19]. Since leptin acts as a satiety factor and appetite and satiety centers in the brain are affected [20, 21]. The information stored in the body fat and leptin in the hypothalamus of the energy situation has led to the regulation of food intake and energy expenditure in order to maintain a constant body weight [22, 23]. It probably acts on the hypothalamus, the number itself does that one of the important functions to perform, including reduced body fat mass, reduced hyperglycemia and increased consumption of fat metabolism and weight loss is the result [24, 25]. Since the study, total cholesterol and triglyceride and LDL in most of the treatmental group showed a significant increase and the positive relationship between leptin and blood fats can increase blood fats stating that leptin reduces appetite and weight loss is the result. Previous research has also expressed high levels of LDL cholesterol and coronary heart disease is an important factor [26]. There is evidence that increased low density lipoprotein LDL and triglycerides also predispose a person to atherosclerosis, while the increase may not do it very low density lipoprotein [27]. Other research presented at the beginning of stages of atherosclerosis, the arrival of low-density lipoprotein in the vessel wall, which is the accumulation of low-density lipoprotein oxidation and adhesion, migration and differentiation of monocytes, causing the inflammation prevents be. According to what was mentioned that spinach extracts contain antioxidants that include the flavonoids, vitamin C and many other compounds [28, 17]. Flavonoids have beneficial effects in various diseases are particularly well expressed in turnip extract increases fat metabolism and have anti-inflammatory effects [29]. It also stated that free radicals produced by metabolism, smooth muscle cells lining blood vessels are able to LDL oxidation [30]. Dynamic hydroxy acid derivatives and flavonoids that are found abundantly in spinach root, has a direct and powerful antioxidant properties and effects of free radicals are Scaper [31]. Vitamins and herbal antioxidants may reduce free radicals and reduce the risk of cardiovascular disease in hyperlipidemic patients may improve endothelial function [32]. Besides vitamin C as an antioxidant plant compounds in reducing lipid peroxidation and oxidative damage to the vasculature [33]. Vitamin C through two main mechanisms causing favorable changes in HDL and LDL levels are: 1. the antioxidant effect that acts to reduce oxidation of LDL and its receptors is increased by recognition. 2. with the competitive effect (due to the structural similarity) in the Glycation HDL and LDL increased with glucose catabolizes reduce LDL and HDL are excreted [34]. As turnips also contain quercetin, which is also a Flanol with antioxidant properties [28]. Therefore, in this study the maximum dose in the treatmental group compared to control LDL cholesterol is the only one that has received significant reduction is observed and in the group with LDL levels less than the maximum dose and minimum dose group showed an average increase of turnip root extract is useful. We have previously stated that the high-density lipoprotein in hyperlipidemic patients has beneficial effects on these activities resulting in lower levels of the lipid defects in patients with coronary artery disease subjects will be followed [9]. As stated in the study of high-density lipoprotein has increased significantly in the treatmental group than the control group and the sham 1. As the increase in the expression should be useful because these type of cholesterol out of the arteries by removing harmful cholesterol and in the prevention of heart attack and stroke helps, so it is better to have high blood levels of HDL cholesterol [35]; The previous posts have explained that this could be due to the favorable properties of turnip extract and its flavonoid content as well. Research on similar compounds in plants by
Turnip on rabbits with high-cholesterol diet was expressed that the concentrations of total cholesterol, triglycerides and LDL cholesterol in rabbits receiving cholesterol extracts cholesterol compared to those who only get dropped [36]. Agrees with the results of the present study is that the results indicate the effectiveness of turnip juice on the adjustment mode, dyslipidemia, and high cholesterol is caused by eating food. Previous studies have shown that corn oil to reduce cholesterol is an effective material because it has a large amount of polyunsaturated fatty acids that help to lower cholesterol and while it is negligible amount of saturated fatty acids [37, 38]. Unsaturated fatty acids has led to the atherogenic LDL is reduced [39]. Therefore, in this study, LDL levels in sham 2 compared to sham 1 showed a significant decrease. Above shows that corn oil has less cholesterol is a risk of and partly in the present study is useful in past research has also pointed to the fact that the effect of corn oil not only lower cholesterol and LDL levels have been determined, but its beneficial effects in animal experiments heart tissue metabolism, liver and kidney as well as the prevention of myocardial ischemia and reperfusion increases myocardial tissue has been demonstrated in animals [40]. For this reason, the use of corn oil in diets for prevention of coronary heart disease has been suggested.

Conclusions:

According to the results of the study can be stated that it somewhat reduced cholesterol spinach juice is also extended to human.

References


