Study the effect of vital component in Pomegranate fruit *(Punica granatum)* on some biochemical parameters in white rat males.

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Abstract

This research designed to investigate the effect of Vital content in pomegranate fruit on serum cholesterol, Triglyceride, LDL and HDL in white rats, and its activity in preventing cardiovascular disease through the effect on fat. Local pomegranate used for extracting treatments .groups divided into two major groups depending on type of food first fed diet free fats and the second fed diet rich in fats , both major groups divided into three sub-groups depending on the treatment type. standard laboratory circumstances prepared , the study continued for 6 weeks then blood were taken from rats then cholesterol, triglyceride HDL and LDL levels were measured in all groups , study results showed increasing in cholesterol, triglyceride , and LDL levels when animals fed diet rich in fats and decreasing in HDL levels in value ($P < 0.05$) comparing with control group fed diet free in fat, while groups fed diet rich in fat and diet free in fat got pomegranate content showed decreasing in cholesterol, triglyceride and LDL levels and increasing in HDL level in value ($P<0.05$) comparing with group fed diet rich in fat non treated with pomegranate content and comparing with control group.

دراسة تأثير المركبات الفعالة في ثمار الرمان *(Punica granatum)* Pomegranate على بعض المتغيرات الكيموحيوية في مصل دم ذكور الجرذان البيض

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الملخص

صممت هذه الدراسة لاختبار تأثير الرمان وما يحتويه من مركبات فعالة في العصير و قشور وبذور الرمان على مستوى الكولسترول والكلسيريدات الثلاثية والبروتينات الدهنية واطئة الكثافة LDL والبروتينات الدهنية عالية الكثافة HDL ، ومدى فائدة الرمان في الوقاية من أمراض القلب الوعائية من خلال تأثيرها على مستوى الدهون في الجسم . تم استخدام العصير المحلي لاستخراج العصير ومنقوع القشور والبذور من الثمرة . استخدمت في هذه التجربة ذكور الجرذان البيض وقسمت الى مجموعتين رئيسيتين وغذيت بنوعين من الغذاء الأول غذاء خالي من الدهون في مكوناته والثاني غني بالدهون ، تضم كل مجموعة ثلاث اقسام حسب نوع المعاملة ، تم توفير ظروف مختبرية م لائمة للحيوانات واستمرت التجربة لمدة 6 اسابيع بعدها تم اخذ عينات الدم من القلب مباشرة بعد تخدير الحيوان ، واجري فحص الكولسترول والكلسيريدات الثلاثية والبروتينات الدهنية عالية الكثافة HDL ، وحساب قيمة البروتينات الدهنية واطئة الكثافة LDL ، اشارت نتائج الدراسة الى ان تناول الغذاء الغني بالدهون يزيد معنويا من مستوى الكولسترول ، الكلسيريدات الثلاثية و LDL ويخفض من مستوى HDL في مصل الدم عند مستوى معنوية ($P<0.05$) مقارنة بمجموعة السيطرة غير الحاوية على الدهون في غذائها ، بينما اظهرت المعاملة بمكونات ثمار الرمان الى دور الفلافونيدات والفينولات المتعددة والفيتامينات في خفض مستوى الكولسترول ، الكلسيريدات الثلاثية و البروتينات الدهنية واطئة الكثافة LDL بينما لوحظ زيادة معنوية في مستوى البروتينات الدهنية عالية الكثافة HDL عند مستوى معنوية ($P<0.05$) مقارنة بالجرذان غير المعاملة بمكونات ثمار الرمان ومجموعة السيطرة .

Introduction

Every cell in human body needs oxygen continually to change digested diet into energy through energy production operation , but sometimes damages come with it when resulted some atoms which known free radicals that have a single negative electron gives it ability to reacting with a positive electrons to oxidize it (Kim *et al*.,2003; Matkovics,2003) . cell needs a little of these free atoms , but aggregate it cause a lot of harms. (Kumar *et al*.,2008) , so body needs antagonistic to it called Free radical scavengers which naturally found in the body and work to equability free radicals , also there are a lot of fruits and vegetables contain dietary elements work as anti-oxidant like pomegranate which it the study subject , It contains materials work as antioxidant (YU *et al*.,2008), like polyphenols , Flavonoids and vitamins in pomegranate . The juice consist of 85% water, 10% sugar, 1.5% pectin , polyphenolic flavonoids and Vitamins. From those polyphenols are anthocyanins, cstechins ,ellagic tannins (Kaplan *et al*.,2001; Narr *et al*.,1996) . Diet rich in fats could increase activity of free radicals because the oxidation become easily in fats more than in carbohydrate or proteins and cocking in a high temperatures with fats could result a lot of free radicals. Therefore our target is to identify the harms of eating food rich in fats especially that used recently in the local market provided by ministry of trade , also identify the benefits of natural foods and the vital component in decreasing harms resulted from eating diets rich in fats and avoid the side effects that cause it. A lot of researches referred to the importance of pomegranate and its medical uses , it is stop the growth of cancer cells in breast and prevent transfer it (Kim., 2002) , works to enhance cardiac muscles (Iakovleva, 1998) , also it is approved as antibiotic for Bacterial and inflammations and prevent hepatic fibrosis (Thresiamma & Kuttan., 1996) . The aim of this study is to investigate the effect of pomegranate fruit on some biochemical parameters in white rats.

Materials and methods

Materials : local pomegranate juice extracted from the fruit directly , impregnate of peels and seeds 1g for each 5ml of water for 24 hour extracted from the fruit and kept in freeze at – 10 c until use. Nutrient : standard diet used in this study , added palm oil to one of the test groups and drinking water. Subjects :white male rtas *Sprague-Dawley* used in the study in weights 150-200g , ages 8-10 weeks , put in cages in divided into two major groups first one fed diet free in fats and second rich in fats , first group divided into three sub-groups first , control got ringer solution , second got pomegranate juice(5ml/kg) and third got impregnate of peels and seeds 5ml/kg . the second major group fed diet rich in fat and divided to three groups got the same treatments in first major group. Research made in animal house of biology department in Tikrit university ,all laboratory requirements and circumstances prepared from temperature to lights and dark circulation . Duration : study continued for 6 weeks then animals left 12 hour in fasting then blood were taken from the heart directly , blood incubated in water bath 37c and centrifuged in 3000c per min. for 15 min. the cholesterol , triglyceride and HDL were measured by Spectrophotometer using KIT provide by (Spinreact, S.A.Espain) and then calculate LDL level.

Results

Table (1):- The mean of standard level of lipid profile of content at treated group

Parameters / Treatments	cholesterol Mg/dl	TRG Mg/dl	HDL Mg/dl	LDL Mg/dl
Control(free fat)	103.4±3b	112.2±2b	54.8±2a	26.6±3a
Juice(5ml/kg)	92.3±4 a	101±3 a	60.7±2b	11.4±3 b
Impregnate seeds & peels (4ml/kg)	89.6±3 a	98.4±2 a	58.2±1b	11.72±4b

Similar letters mean no significant difference
Different letters mean significant differences
Values in ± mean standard aberrancy

Table (2):- the mean of standard level of lipid profile of content at treated group

Parameter / Treatment	cholesterol Mg/dl	TRG Mg/dl	HDL Mg/dl	LDL Mg/dl
Control(free fat)	148.6±3 a	151.4±2 a	36.6±2 b	81.7±3a
Juice(5ml/kg)	126.3±3 b	131±4 b	44.7±3 a	55.4±4 b
Impregnate seeds &peels (4ml/kg)	127.6±4 b	129.4±4 b	43.2±2 a	58.52±4b

Similar letter mean no significant difference
Different letters mean significant differences
Values in ± mean standard aberrancy

Discussion

Results showed that diet rich in fats increased significantly the levels of cholesterol, triglyceride and LDL in value ($p<0.05$) comparing with group that fed diet free in fats (table 1,2) , while decreasing in HDL where noticed in value ($P<.0.05$) comparing with group that fed diet free in fats. Concluding from that continuing eating food rich in fats form a risk factor for cardiovascular disease (Yip *et al*.,1998; Vakkilainen 2002) . increasing fatty acids in blood stimulate liver to product cholesterol ,triglyceride and lipoproteins then release it to blood and decrease level of HDL that transfer bad fats in blood to the liver (Cromwell and Otvos,2004; Kaplan *et al*.,2001). Treating with juice and impregnate peels and seeds led to a significant decrease in cholesterol, triglyceride and LDL levels in value ($P<0.05$) comparing with control group , this decreasing is may related to the role of flavonoids and vitamins in the fruit component like Tanins , vitamin C and vitamin E which reduce cholesterol and triglycerides oxidation also it is induce LDL receptors and reduce lipid production in liver and lipid peroxidation (Borradaile 2003; Avarim *et al*.,2000) by inhibit enzymes responsible of fat acids oxidation like, Hepatic fatty acid synthase , glucose-6-phosphate dehydrogenase (Jung *et al*,2006) , in addition to flavonoids work as antioxidant where it linkage with free radicals to prevent oxidation with lipid then reduce of lipid peroxidation and the risks results from it (Kaplan *et al*.,2001; Avarim *et al*,2000) . while flavonoids and vitamins in pomegranate increase HDL and enhance the activity of transferring bad fats to the liver (Jung.,2006; Kaplan *et al*.,2001). It is noticed in this study that the treating with impregnate peels and seeds shows non significant activity more than juice and that might be related to the content of impregnate comparing with the juice . it could be there other effects of pomegranate in liver enzymes and other biochemical parameters in the blood but the study time not enough to surround it and it will be studied in future.

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