THE EUROPEAN SOCIETY OF MEDICINE
Medical Research Archives, Volume 14 Issue 5

RESEARCH ARTICLE

Can a liver which is exposed to drugs and alcohol be supported from eating herbal remedies including seeds from rose-hip?

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OPEN ACCESS

PUBLISHED
31 May 2026

CITATION
Winther, K., 2026. Can a liver which is exposed to drugs and alcohol be supported from eating herbal remedies including seeds from rose-hip? Medical Research Archives, [online] 14(5). https://doi.org/10.18103/mra.v14i5.7436

ISSN
2375-1924

ABSTRACT

Background: Certain plants have been claimed to offer some kind of liver protection, often documented as a decline in the liver enzyme amino transferase. The intension of this paper was to outline such plants and to possibly add a new plant Rose-hip (*rosa-canina L*) to the list.

Methods: Ten healthy middle-aged volunteers equally represented by both sexes were included in an open study where 20 gram of powdered seeds from rose-hip was treated, daily, for three month. Amino transferase, lactate dehydrogenase, C-reactive protein, cholesterol fractions and glucose metabolism including body weight was tested initial and after three month of treatment.

Results: There was statistically significant declines in amino transferase and C-reactive protein and an improvement of HDL-cholesterol as the result of three month treatment. All other parameters remained unchanged.

Conclusion: The present data show that powdered seeds from rose-hip, when treated for three month, can reduce the liver enzyme amino transferase and work anti-inflammatory. The present data suggest that seeds from rose-hip may protect the liver.

Introduction

Longevity has been a buzz word for several decades. Promoting longevity, however, very often means that different drugs have to be taken to support the aging body. On top of this alcohol intake does not necessarily decline as the result of aging. And it is well known that the intake of alcohol and medicine, such as paracetamol, NSAIDs, tramadol and codeine which is used by many in the aging population for their pain, as monotherapy or sometimes even in combination, can have consequences for liver function as the metabolization of above mentioned ingredients takes place in the liver [1-5]. Moreover, it should be brought into consideration that the liver concentration of the master antioxidant glutathione, that neutralizes break down products from many ingredients metabolized in the liver, including products from medicine, and in that way protects the liver, is declining when you passes the age of fifty [6, 7]. This indicating that an aging liver can easier get "overloaded" that the liver from a younger person [6-9].

Liver damage caused by alcohol and medicine or the combination of these, mostly hits the middle aged and elderly population and is a burden to society worldwide and also very costly and the agony for the person who suffers is great. Early symptoms are fatigue, itchy skin and belly pain. Early biochemical signs of liver damage is often an elevation of the liver enzyme ALT (amino transferase) an enzyme mainly found in liver cells which increases when liver cells are damaged [1-5]. It is therefore interesting that certain plants and food supplements, including our daily food if created from such plants, has been shown to modify the level of ALT in human liver cells [10, 11].

Amongst such interesting plants are artichoke where a recent meta-analysis indicated a significant decline in ALT [12]. A similar pattern was shown for beetroot [13]. Also dandelion root, milk thistle, curcumin, green tea and several other herbs are reported to protect the liver also when liver damage is related to lipid accumulation and alcohol abuse [14, 15].

The aim of this paper was to place some focus on plants with possible ability to protect the liver and to preliminary test if seeds from Rosa *canina* (Rose-hip) may improve the liver when defined as a reduction in ALT.

Materials and Methods:

Rose-hip (*rosa canina L*) has been used for soup and marmalade in the Scandinavian countries for centuries and in folk medicine the fruits from rose-hip has also been mentioned to protect from cold in the winter season possibly due to a high content of vitamin C [16, 17]. Recently a powdered version of fruits from a subspecies of rose-hip, Lito, containing the flesh as well as the seeds, from which the itchy hairs had been removed, was reported to lower pain and joint stiffness and to improve daily activity in osteoarthritis [18, 19] and also to some extend improve symptoms and reduce markers of rheumatoid arthritis [20]. The product is well tolerated in even high doses [21], and the aim of the present study was to test if powdered seeds from rose-hip would have any impact on liver function when testing ALT which, as stated earlier, is mainly found in the liver and is a marker of liver cell destruction [1-5]. In the same study we also tested lactate dehydrogenase (LDH) which is found in all types of cells throughout the entire body and known as an unspecific determinant of cell disintegration, the anti-inflammatory agent C-reactive protein (CRP), cholesterol fractions, glucose metabolism and body weight. Ten healthy volunteers, 5 men and 5 women, mean age 56,8 years (range 36-70 years) mean weight 88.35 (range 53-135 kg) were given 20 gram dried rose-hip seed powder per day, for a period of three month in an open design. On the day of inclusion and again after three month of treatment the following variables were evaluated: ALT, LDH, C-

reactive protein (CRP), total Cholesterol, HDL cholesterol, LDL-Cholesterol, triglyceride, HgA1c, blood glucose and body weight.

Rose-hip berries as seen in nature are given (left panel). Rose-hip berries which are opened, so the seeds are visible are given (right panel).

Results:

Details are given in table 1. There was a statistical significant improvement in CRP, ALT and HDL-Cholesterol whereas the remaining parameters did not change significantly within the three month time period. Compliance was 84% (range 50-99%).

Table 1: C-reactive protein (CRP), liver parameters, cholesterol fractions, glucose metabolism and body weight, initial and after three months treatment.

	Start (range)	3 Months (range)	P-value
CRP (mg/l)	11.45 (1 - 29)	4.33 (1 – 10)	p<0.050
ALT (U/l)	32.56 (17 - 81)	25.70 (12 – 54)	p<0.050
LDH (U/l)	182.00 (138 - 217)	189.00 (142 – 228)	ns
Cholesterol (mmol/l)	5.15 (3.7 - 6.6)	5.25 (3.6 – 6.8)	ns
HDL Cholesterol (mmol/l)	1.41 (1.10 – 1.70)	1.65 (1.18 – 2.25)	p<0.050
LDL Cholesterol (mmol/l)	3.02 (2.10 – 4.30)	2.85 (1.60 – 4.30)	ns
Triglyceride (mmol/l)	1.74 (0.87 – 2.61)	1.58 (0.72 – 2.57)	ns
HgA1c (mmol/mol)	36.82 (26.00 – 47.00)	36.87 (29.00 – 45.00)	ns
Glucose (mmol/l)	6.36 (4.60 – 7.00)	6.26 (5.50 – 7.40)	ns
Weight (kg)	88.36 (53 – 135)	86.60 (54 – 130)	ns

There is a statistical significant (p<0.050) decline in the liver enzyme ALT and the inflammatory marker CRP. HDL-cholesterol significantly improved (p<0.050).

Discussion:

A lowering of CRP and an improvement of HDL-Cholesterol has also been observed in other clinical trials testing the present powdered rose-hip [19, 21]. And total cholesterol was like wise significantly lowered in a double-blinded, randomized study treating rose-hip powder to patients suffering osteoarthritis [22]. And in a study on rheumatoid arthritis, using the same powder, a lowering of the inflammatory marker Sedimentation rate (SR) was like wise observed [20]. However the observed decline in ALT has never been reported before in any study testing rose-hip, and needs some further comments. At first, precautions should be taken as this was an open trial on a small number of volunteers, and this pilot study should be followed by a well-designed, placebo-controlled, randomized clinical trial where a much higher number of volunteers are included. However the drop in ALT was consistent (about 20%) and even greater than what was observed for several of the herbs earlier mentioned in this short communication [12, 15]. It may take a certain time before changes of ALT can be observed from treating plant materials. From what can be seen from the literature it seems to take at least 8 weeks of treatment before a significant decline in ALT occur as the result of herbal treatment [12-15]. In an earlier study treating the same amount of rose hip seed powder, this time together with also powdered rose-hip shells, a four week treatment period was not enough to show significant changes in any liver parameter including ALT [21]. However in this study there was a statistically significant improvement in kidney function, defined as a statistically significant decline in serum-Creatinine, as the result of rose-hip treatment. So possibly rose-hip or at least the present version of rose-hip, subspecies Lito, in different ways can support detoxification. An impact on kidney function and detoxification was also documented when rose-hip was tested with special regard to glomerulonephritis and systemic lupus erythematosus in an animal model [23].

It is too early to speculate on possible mechanisms behind the observed improvement of the liver enzyme ALT. Rose-hip is known as the strongest anti-oxidants among fruits [24]. Rose hip is also known for its high content of vitamin C and the seeds are containing high amounts of tiliroside, linoleic and alpha-linolenic acid, as mentioned in a detailed summary of active ingredients in rose-hip [25]. There was a drop in body weight of about two kg as the result of rose-hip treatment. This drop did not attain statistical significance. It is however, interesting to note that in a Japanese study treating 32 volunteers the same diet, a significant drop was observed in body weight and in visceral fat after three month of treatment [26]. The relatively small number of volunteers included in the present trial, can have made it more difficulty to attain statistical significance and we did not have the ability to measure visceral fat.

Conclusion:

We are growing older and older in these years nearly worldwide and aging often means more medicine to be taken to support the aging body. At the same time an aging liver can have difficulties to manage detoxification due to a lover level of glutathione a main anti-oxidant. As medicine and also alcohol is metabolized by the liver, it is important to focus on foods and food supplements, which can support the liver, especially when discussing nutrition for the elderly. I hope that this short communication which point out plants with known capacity to protect the liver and add one more new plant with some liver protective ability, the rose-hip, can work as an appetizer so more researchers can look into plants and liver protection. Especially more knowledge about the more basic mechanisms behind the protective impact from certain plants on the liver would be of great value.

Possibly in near future when hopefully more detailed research on plants supporting the liver is available we can create a daily salad containing liver supporting herbal ingredients and the same

salad might even work as an anti-inflammatory and that way around possibly modify the intake of painkillers like paracetamol, NSAIDS, tramadol, codeine and other types of medicine this in itself would further support the liver [22,27].

Conflicts of Interest Statement:

The author declare that there are no conflicts of interest.

Funding Statement:

There was no funding of this research.

Acknowledgements:

Christina Nielsen is acknowledged for preparing the table.

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