

Effects of Intake of Oatmeal in Serum Cholesterol

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Abstract: *Back ground:* Soluble fibre has a cholesterol lowering effect. It is found in various grains especially barley and oats, as well as in pulses, fruits and vegetables. Oats contain a form of soluble fibre called oat beta-glucan which is particularly concentrated in the outer layers of the grain. Much of the research into the cholesterol lowering effects of soluble fibre has centered around oat beta glucan. *Aim:* The aim of the present study is to check the effect of intake of oat meal on serum cholesterol level *Method:* The study group included healthy adult men and women aged 30–65 years. The participants received a daily serving of 100g oats for 4 weeks. Blood samples were analyzed for total cholesterol before and after the study. *Result:* The results show a significant decrease in the level of total cholesterol in subjects after intake of oatmeal both for normal subjects and for hyperlipidemic patients.

Keywords: Cholesterol, Oat Beta glucan, Hyperlipidemic, soluble fibre

1. Introduction

Coronary heart disease (CHD) is a leading cause of morbidity and mortality globally [1,2]. It is well established that reducing serum low-density-lipoprotein-cholesterol (LDL-C) reduces risk for CHD[3]. Lifestyle modifications to reduce CHD risk includes increased consumption of viscous soluble dietary fibre[4].

Oats are high in soluble fibres and effective in reducing the risk of cardiovascular diseases (CVD)[5]. It has been reported to reduce serum cholesterol and obesity; prevents coronary heart diseases and improve symptoms of diabetes. Oats contains 2.0~7.5% B-glucans, 13~20% protein, 2~12% crude fat and about 60%starch. Most of the studies focus on the health benefits of B-glucagon while the effects of other main components on reducing serum cholesterol are still unknown[6-8].

The mechanism by which soluble fibre reduces serum cholesterol is not definitely established. The most likely postulate is that intestinal bile salt adsorption by fibre prevents bile salt reabsorption with or without dietary cholesterol absorption[9]. This leads to increased bile salt synthesis and low-density lipoprotein (LDL) receptor upregulation and enhanced LDL catabolism. This and other studies have generated growing public interest in appropriate foods to help lower blood cholesterol. Physicians and other health professionals recommend reducing intake of total fat, saturated fatty acids, and cholesterol to maximise blood cholesterol lowering. A relatively simple step towards improving dietary behaviour may be emphasis on daily inclusion of carbohydrate foods high in water soluble fibre-oats, to help displace some of the saturated fat and cholesterol containing foods[10-13]. By advocating foods to eat rather than focussing only on foods to restrict, dietary adherence and nutrient adequacy may be better achieved[14 &15]

To explore the efficiency and feasibility of this approach, this study was designed to measure the dietary changes and biochemical response of including moderate daily amounts of instant oats in the diet of free-living, hyperlipidemic men and women [16-20].

2. Materials and Methods

The study group included healthy adult men and women aged 30–65 years. The participants received a daily serving of 100g oats for 4 weeks. During the study, the participants were instructed to reduce other high carbohydrate food intake so that their total energy intake would be constant during the course of the trial. They were also instructed to remain at their usual level of physical activity and dietary habits. The subjects were seen at weekly intervals for 4 wk. Blood samples were analyzed for total cholesterol before and after the study.

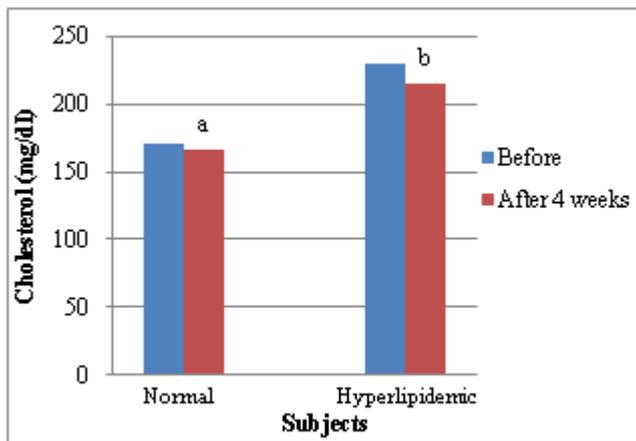
3. Results and Discussion

In the present study the total cholesterol level was checked before and after intake of 100 g oats for four weeks and the results are given in table no 1. The study results were statistically analysed using Paired t- test. The results show a significant decrease in the level of total cholesterol in subjects after intake of oats both for normal subjects and for hyperlipidemic patients.

Table 1: Total cholesterol level before and after study

Parameter	Normal Healthy Subjects		Hyperlipidemic Patients	
	Before	After 4 weeks	Before	After 4 weeks
Cholesterol Level (mg/dl)	171.80 ± 10.76	167.40 ± 10.62 ^a	230.20 ± 14.39	216.50 ± 9.16 ^b

Paired t-test was conducted; a = p<0.0; b = p<0.001



4. Discussion

In this study, consumption of moderate amount of instant oats in the daily food pattern fostered blood cholesterol lowering in hyperlipidemic individuals. The data suggest that dietary adaptation to the practice of regularly eating oats potentiates favourable effects on blood total and LDL-cholesterol levels as well as on nutritional status by reducing intake of total fat, saturated fat and cholesterol without weight gain and improving intake of commonly deficient nutrients i.e. Iron, calcium and vitamin B6. Oats contain a form of soluble fibre called oat beta-glucan which is particularly concentrated in the outer layers of the grain. Much of the research into the cholesterol lowering effects of soluble fibre has centered around oat beta glucan. The oat beta glucan is a soluble form of fibre, it dissolves inside the digestive tract where it forms a thick gel. This gel is able to bind to excess cholesterol and cholesterol like substances within the gut and help to prevent these from being absorbed into the body. The gel and the cholesterol is then excreted as part of the body's waste.[31-37] Previous studies have mentioned various benefits for consumption of fibers. Lower BMI and preventing the obesity have been reported to be associated with higher intake of dietary fibers by consuming fruits and vegetables [38]. Dietary interventions, such as The Portfolio diet which is high in plant sterols, soy protein, almonds, and viscous fiber, have been documented to reduce cholesterol levels effectively. The data from this study supports, increased intake of viscous fiber like oats decreases total blood cholesterol concentrations.

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