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Investigation on The Effect of Phytosterols on Lipid Profile

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ABSTRACT

The intake of phytosterols regularly help to reduce cholesterol and the LDL- cholesterol blood levels. The decrease in the level of total cholesterol, LDL-cholesterol and triglycerides in addition to increase in the level of HDL done by phytosterols might reduce the risk of coronary disease thus lead to consider phytosterols as cardio-protective agent.

1. Introduction

One of the greatest vital risk causes for cardiovascular disease is hypercholesterolemia. The cholesterol level organized by cholesterol absorption from the diet and by endogenous cholesterol synthesis. The absorption of cholesterol from the intestinal milieu occurs through a sequence of stages, involving emulsification, hydrolysis, micellar transport, mucosal absorption, resynthesis of parent molecules in enterocytes, and gathering with apolipoproteins to form chylomicrons, which are secreted from intestinal cells. Dietary components and drugs can interfere with some or all of these steps. There are a many compound of phytosterols including brassicasterol, campesterol, stigmasterol, and beta sitosterol. Certain herbs have extraordinary concentration of phytosterols, for example, saw palmetto. Usual human food holds small quantities of phytosterols, mostly campesterol and sitosterol. Absorption in Intestin of these vegetable sterols is little [1].

A study by AB Thomsen have confirmed the effect of plant sterols or stanols on reducing cholesterol absorption and examined the mechanism of action. Although there are some data on the possible athero-genic effect of the phytosterols [2]. Different studies conducted in animal models and humans have demonstrated a reduction in the atheromatous plaque after the administration of plant sterols (Fig. 1). Stanols can play an important role in the use of diet as a therapeutic measure [3, 4].

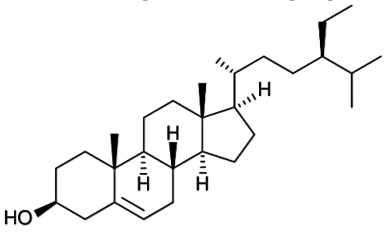

Fig. 1 Sterol structure

2. Experimental Methods

The study designed to investigate the effect of phytosterols on the level of lipid profile so the subject used phytosterols 1000 mg supplied from Solgar, U.S.A. The lipid profile measurement done with Reflotron plus EN device from German with Reflotron strip. The samples collected before taken the phytosterols and after 30, 60, 90 and 120 days the measured done and the results showed in the Fig. 2.

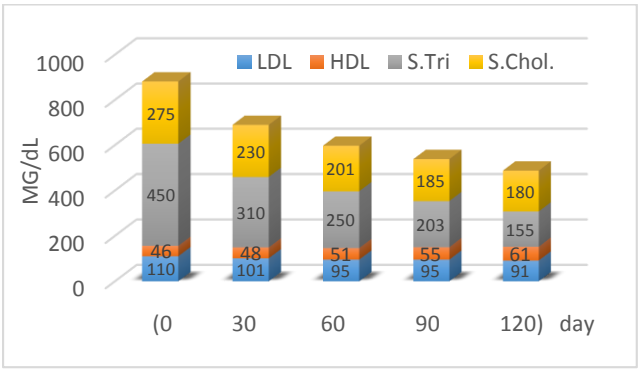

Fig. 2 The changes in levels of Lipid profile

3. Results and Discussion

The results of this study will provide valuable information on the efficacy of plant sterol ester supplements in preventing cardiovascular disease by lowering plasma cholesterol levels and consequently cardiovascular risk [5]. Phytosterols might be advantageous in decreasing cholesterol levels. Because they have very little systemic absorption and are existing in healthy diets, aggregate the intake of phytosterols might be a practical way to decrease coronary heart disease with lowest risk. Foods having phytosterols help to reduce cholesterol, and the US Food and Drug Administration has permitted these products "as part of a dietary strategy to decrease the danger of coronary heart disease. Snacking on cocoa-flavored bars enriched with phytosterols can reduce cholesterol levels. The best possible explanation for our results in Fig. 2, that dietary phytosterols may decrease the bioavailability. Consumption of

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phytosterols revealed to decrease the bioavailability of β-carotene and α-tocopherol [6]. The fact that phytosterols prevent the absorption of cholesterol by decreasing its micellar solubility [7]. Make it likely that they compete for combination into mixed micelles during absorption. Furthermore, phytosterols are ligands for liver X receptors (LXRs), nuclear receptors that act as transcription factors and regulate gene expression for proteins involved in lipid metabolism. Phytosterols induce the expression of certain ATP-binding cassette (ABC) transporters [8]. A Investigation of the pharmacokinetics of this metabolite and its urinary excretion in the presence of phytosterols (single dose or long-term intervention) may provide a better understanding of possible interaction(s) of phytosterols during absorption. Phytosterols diminish LDL cholesterol levels [9, 10]. These sterols found naturally in numerous oils from plants compete with cholesterol for a place in the mixed micelles, required for cholesterol absorption by the small intestine [11]. Thus, cholesterol absorption, both from food or from bile salts is dropped, regardless of an increase in hepatic cholesterol synthesis [12].

4. Conclusion

The intake of phytosterols regularly helps to reduce cholesterol and the LDL- cholesterol blood levels. The decrease in the level of total cholesterol, LDL-choLesterol and triglycerides in addition to increase in the level of HDL done by phytosterols might reduce the risk of coronary disease thus lead to consider phytosterols as cardio-protective agent.

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