Journal of Advanced Chemical Sciences 1(3) (2015) 93–94

ISSN: 2394-5311

Contents List available at JACS Directory

Journal of Advanced Chemical Sciences

journal homepage: www.jacsdirectory.com/jacs

Investigation on the Effect of EPA and DHA on Lipid Profile

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ARTICLE DETAILS

Article history:
Received 05 March 2015
Accepted 01 April 2015
Available online 12 April 2015

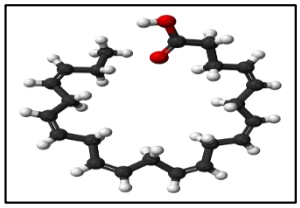
Keywords:
Omega-3 Fatty Acids
Eicosapentaenoic Acid (EPA)
Docosahexaenoic Acid (DHA)
Lipid profile

ABSTRACT

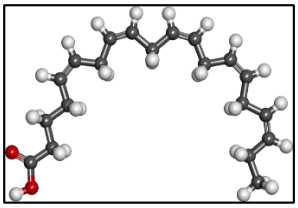
Omega-3 Fatty Acids are a family of naturally occurring polyunsaturated fatty acids (PUFAs). The present study was undertaken to investigate the effects of EPA and DHA on lipid profile. EPA and DHA revealed a hopeful herbal supplement as therapy for hyperlipidaemia and cardiovascular disease.

1. Introduction

Omega-3 fatty acids are a family of naturally occurring polyunsaturated fatty acids (PUFAs). Humans do not have the essential metabolic pathways to synthesise the precursor fatty acids (α-linolenic acid), which is vital for the production of the longer bioactive ω-3 fatty acids. Consequently, the long-chain poly unsaturate fatty acids must be gained from either plant sources or by direct intake of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) from marine or industrial products [1]. EPA and DHA are mostly found in seafood, but fish do not actually produce these fatty acids [2]. The benefit of the high ω-3 fatty acid intake is attributed to their capacity to modulate cellular metabolic functions and gene expression [3]. These actions include the alteration of inflammatory processes in which eicosanoid participate, alterations of cellular membrane structure and functions induced by the incorporation of ω-3 Fatty Acids into membrane phospholipids, modulation of various signalling pathways involved in normal and pathological cell functions, as well as their direct effect on gene expression [1].



Docosahexaenoic acid (DHA)



Eicosapentaenoic acid (EPA)

Fig. 1 The structure of fenofibrate

2. Experimental Methods

The study designed to investigate the effect of omega 3 (EPA 180 mg DHA 120 mg) on the level of lipid profile so the subject used omega 3 1000 mg supplied from Blockmores, Australia. The lipid profile measurement done with Reflotron plus EN device from German with Reflotron strip. The samples collected before taken the omega 3 and after 1, 20, 44, 55 and 72 days the measured done and the results showed in the Figs. 1 - 6.

3. Results and Discussion

This study designed to invstigate the effect of omega 3 on lipids profile, the study revealed that there were positive effect of omega 3 on triglcerids by reduce triglycerids level.

High triglyceride (TG) levels have been recognized as an independent risk factor for coronary heart disease (CHD), while severe hypertriglyceridaemia (fasting TGs ≥500 mg/dL) significantly increases the risk of acute pancreatitis, a potentially deadly complication [4]. Moreover, a key feature of the dyslipidaemia associated with the metabolic syndrome as well as diabetes is elevated TG levels. Fish oil can have a favorable role in the treatment of noticeable hypertriglyceridaemia [5].

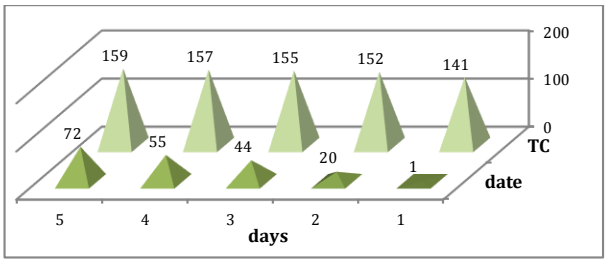


Fig. 1 The changs in levels of total cholestrol

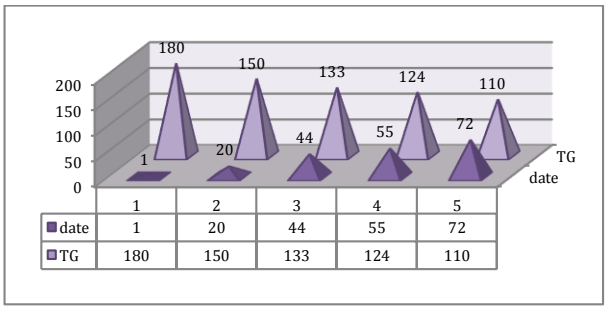


Fig. 2 The changs in levels of triglycerides

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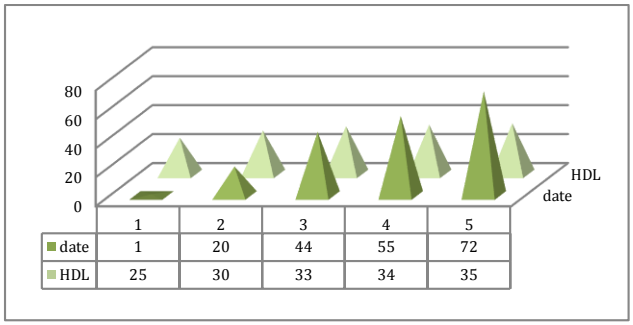

Fig. 3 The changs in levels of HDL

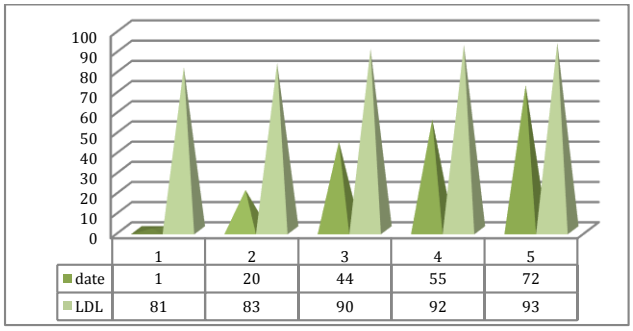

Fig. 4 The changs in levels of LDL

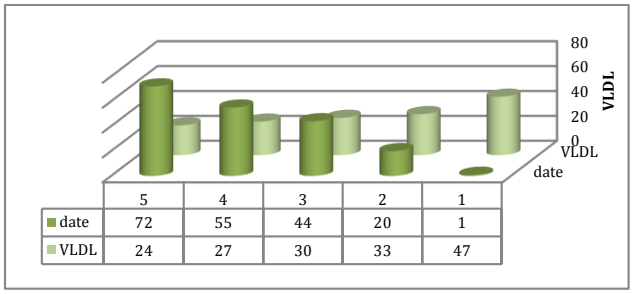

Fig. 5 The changs in levels of VLDL

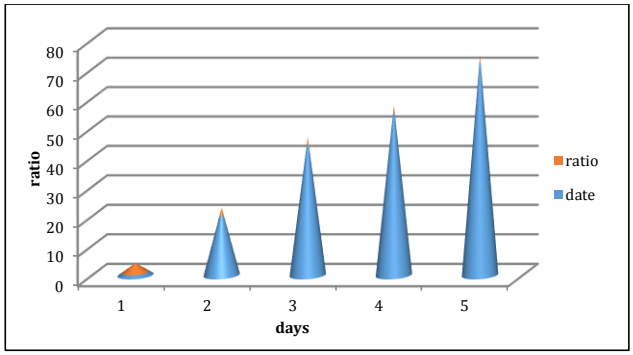

Fig. 6 The changs in risk ratio

According to the American Heart Association, omega-3 fatty acids benefit the heart of healthy people, and those at high risk of-or who have cardiovascular disease. Research has shown that omega-3 fatty acids decrease risk of arrhythmias, which can lead to sudden death. Omega-3 fatty acids as well decrease triglyceride levels as shown in Figs. 1 – 6, also omega 3 fatty acids can slow the growth rate of the atherosclerotic plaque, and produce modest reductions in blood pressure. The omega-3 fatty acids in fish oil seem to be able to expand blood vessels, and this brings blood pressure down. DHA is far more abundant than EPA in the myocardium. DHA alone or in combination with EPA may be more important for protection against dysrhythmias and cardiovascular disease than EPA alone [6]. Omega 3 fatty acids act on triglycerids metabolism primarily include the suppression of hepatic very low density lipoprptein synthesis and discharge [7]. Additionally, the conversions of very low density lipoprptein (VLDL) to intermediate-density lipoprotein (IDL), VLDL to LDL, and IDL to low density lipoprptein (LDL) are significantly increased; this may partly explain the increase in LDL-C levels observed in ω -3 FA-treated patients [8]. On the other hand, ω-3 fatty acids do not significantly change the fractional catabolic rates of apolipoprotein (apo B) in VLDL, IDL, or LDL or change the catabolism of the chylomicron remnants [9]. Consequently ω-3 Fatty Acids effectively decrease the plasma concentration of Triglycerids, mainly by reducing VLDL production but not by altering the catabolism of apo B-containing lipoprotein or chylomicron remnants [10].

4. Conclusion

This study indicate that the supplement of omega 3 fatty acids can lead to clinically decrease the level of triglycerids and this decrease is benefit for cardiovascular disease.

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