

Original article

Effect of Omega 3 (Aquamarine) on Primary Hypertriglyceridemia in Libyan Patients

Mohamed Tabib¹, Nuri Alfasi², Abdussalam Edrah¹, Ebtehal Sour¹, and Elmuhktar Habas¹

1Medical department -Tripoli Central Hospital – University of Tripoli-Libya

2Medical Department, Alkhums Hospital, Almergeb University – Libya

ABSTRACT

Alpha-linolenic acid is an omega 3 fatty acid, which presents in flaxseed, walnuts, soy, chia seeds, and hemp seeds. The Eicosapentaenoic acid (EPA) presents commonly in fish oil, krill oil, and eggs when the chickens are fed EPA. Furthermore, docosahexaenoic acid is also an omega-3 fatty acid that is a component of the human brain, skin, and eyes. A large number of the world population are not taking enough weekly needs of Omega 3, which may lead to harmful complications of the excess cholesterol and triglycerides.

The current Study aimed to assess the significant effect of a high dose of omega3 intake for two months on serum triglyceride in primary hypercholesteremic Libyan patients.

IBM SPSS statistical package 20 was used to analyze the effect of omega3 after one month and three months. The means were compared by paired t-test for the significant effect. P-value < 0.5% is considered statistically significant.

Libyan patients who have primary hyperlipidemia were recruited in the Medical Department of Tripoli Central Hospital. They were consented to have the omega 3 of 1082 mg twice daily and followed for 2 months. Forty-two patients were included, (22 males and 20 females); the age range was between 20-50 years, with a normal body mass index (<27Kg/M²). All other possible risk factors such as diabetes and hypothyroidism were excluded. Their serum triglyceride levels were collected weekly for two months.

After the data collection and analysis, there was a noticeable reduction in serum triglyceride level after one month of following. By the end of the 2nd month, in > 85% of the patients, there was a statistically significant reduction (p<00001) of serum Triglycerides' concentration.

The regular high daily doses of fish oil omega3 have a significant reduction effect on serum triglyceride levels.

Keywords-Hypertriglyceridemia; Omega3;PHT; Libyan;Primary Hyperlipidemia.@Author to whom correspondence should be addressed Dr. Mohamed Tabib, Tel:+218912139214, E-mail : drtabib2002@yahoo.de

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INTRODUCTION

Primary hypertriglyceridemia (PHT) is a relatively common disorder, characterized by high triglycerides level due to an isolated elevation of VLDL particles which results from both overproduction and decreased elimination of these particles.^{1,2} Susceptibility to primary hypertriglyceridemia results from heterogeneous mechanisms which cause elevation of VLDL. High triglycerides (TGs) levels between 300 and 900 mg/dl are often seen in around 5% of adults. It is well known that primary hypertriglyceridemia is often associated with low HDL cholesterol levels. High serum triglycerides may make the serum appear turbid due to the presence of large VLDL particles.³

PHT associates with obesity, insulin resistance, frank diabetes mellitus, systemic arterial hypertension, and hyperuricemia.³ Significantly high TGs levels in PHT are well-known cause recurrent pancreatitis⁴, and associates with increased risk of cardiovascular disease (CVD). Pharmacological intervention and non-pharmacologic therapy are both tried to treat PHT, including fibrates, statins, niacin, and ezetimibe. It was found that fish oil omega-3 fatty acids have a significant positive effect on the general health wellbeing of the treated PHT patients. Sufficient regular omega 3 daily intake was recommended by 2002 revised American Heart Association guidelines⁵: 1) Individuals without documented coronary heart disease were advised to eat fish, (preferably oily) twice per week, which comes to about 500 mg/day of omega-3, 2)

Individuals with hypertriglyceridemia should ingest 2-4 g of EPA (Eicosapentaenoic acid) and (docosahexaenoic acid) DHA omega-3 fatty acids, under physician care.

Based on sufficient scientific studies, the Food and Drug Administration (FDA) documented the positive correlation between taking omega-3 fatty acids and reduction of the risk of coronary heart disease and improved cardiovascular health.⁶

Omega-3 fatty acids consisting of eicosapentaenoic (EPA) and docosahexaenoic acid (DHA) were found to lower TGs by different paths, those include increased glucose flux to glycogen, decreasing lipogenesis, and increasing mitochondrial beta-oxidation.⁷ The National Cholesterol Education Program (NCEP) guidelines recommended that Omega-3 fatty acids (4 g/day) are indicated to patients who have moderate to severe hypertriglyceridemia⁸, decreasing the serum TGs level by 20% to 30%. Patients have plasma TGs levels 200-500 mg/dl, serum TGs reduced by 50-60% on 6g/day of omega-3 fatty acids.⁹ Furthermore, it was noted that omega-3 fatty acids administration in lower doses (1 to 2 g/day) reduce significantly the cardiovascular mortality and morbidity rate.¹⁰ It seems that omega-3 fatty acids intake is an important option in the management of hypertriglyceridemia. Dietary fat and carbohydrate intake have a direct impact on TGs. The fact that diets high in omega-3

fatty acids (O3FAs) reduce hypertriglyceridemia and are linked to lower rates of CVD. It has piqued interest in investigating the role of omega 3 fatty acids in hypertriglyceridemia treatment and cardiovascular complications risk reduction.¹¹

There are two forms of hypertriglyceridemia: primary and secondary. In secondary hypertriglyceridemia, on the other hand, there is no reproducible genetic susceptibility component.¹² Although most individuals with hypertriglyceridemia have at least one secondary factor, not everyone with equal secondary factor exposure develops equally severe dyslipidemia,

Study Aim

Studying the significance effect of regular moderate dose twice daily intake of fish oil omega 3 on the rate of reduction of

Statistical Analysis

Following the data collection, the IBM SPSS Package Version 20 was used to conduct statistical analysis. The mean was computed for the data gathered, and the means of one and two months after omega 3

Materials And Methods

Forty-two patients (22 males and 20 females) who had hypertriglyceridemia were recruited. Their age range was ranged between 20-50 years. All the participated patients had proven primary hypertriglyceridemia. HbA1c and thyroid function test were conducted to the whole

suggesting that endogenous main monogenic or polygenic susceptibility may play a role. In the context of assessing the risk of CVD, the Adult Treatment Panel III of the National Cholesterol Education Program has proposed four triglyceride strata: normal (1.7 mmol/L), borderline high (1.7–2.3 mmol/L), high (2.3–5.6 mmol/L), and very high (> 5.6 mmol/L). There have been no previous studies in the Libyan population to assess the effect of regular medium daily omega3 doses on serum TGs, as far as we know. As a result, the current study was designed to test the hypothesis that even moderate regular daily omega-3 doses taken for a month or two can dramatically lower serum TGs.

hypertriglyceridemia in PHT Libyan patients.

administration were compared using a paired t-test. When the P-value was less than 0.5, the drop in serum TGs was considered statistically significant.

recruited patient to exclude diabetes and hypothyroidism. The range of the included patients' weight was ranged between 50-75 kg (maximum BMIs of 27kg/M²). The included patients were not taking drugs that can affect the intervention agent such as statins ezetimibe and Omega-3 before

they were included in the study. The patients were put on Aqua Marin Omega-3 fish oil containing about 1082 mg twice daily and followed for 2 months. The patient's age, sex, weight, and height were recorded. TGs level was checked after 10-12

hours of fasting. All the blood was checked in the Tripoli Central hospital main laboratory as following; day 0 (ie before starting the intervention), one month after, and 2 months after starting the Omega 3 on the regular weekly pattern.

Results

There was no significant difference in weight as well as the body mass index between the recruited patients. Their age was ranged between 20-50 years (Figure 1; Table 1), and their body mass index was 27Kg/M². Statistically, there was a significant reduction of TGs observed in > 85% of the patients by two months following taking regular omega-3. TGs reduction was not different significantly between the two genders, ie the TGs

reduction in males and females was almost identical. Analyzing the TGs reduction after a month and after the two months following omega 3 introduction was revealed a highly significant reduction in the two occasions (<0.00001), when compared with day zero levels. However, the reduction rate of TGs serum concentration was more significant during the first month after omega 3 administration (Table 2).

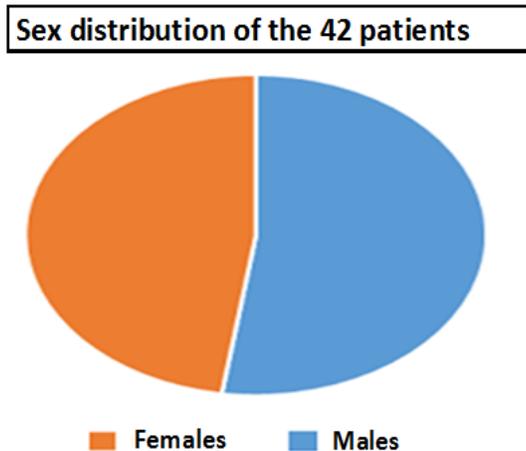
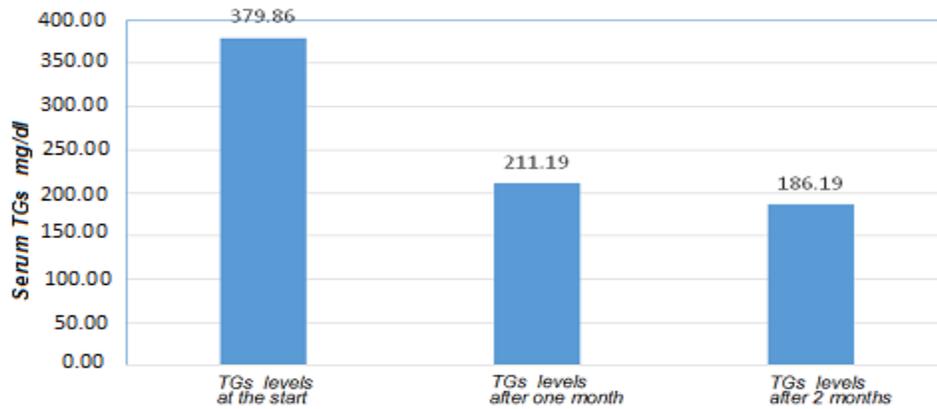


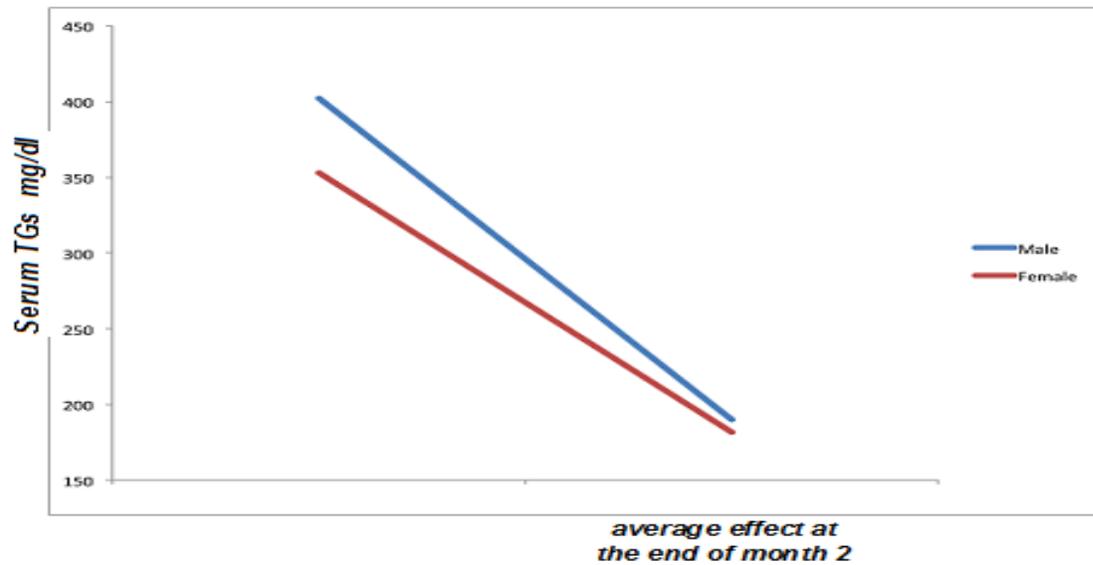
Figure 1: Percentage of female to male distribution.

Table 1: Frequency and the percentage of participates.

Valid	Frequency	Percent
Females	20	47.6
Males	22	52.4
Total	42	100.0



Overall mean serum TGs levels for the 42 Libyan patients with PHT before and after Omega-3, Tripoli Central Hospital - Libya



T-Test

Figure 2. T-test analysis of the effect of omega 3 on the TGs.

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	TG0	379.86	42	57.935	8.940
	TG1	211.19	42	45.335	6.995
Pair 2	TG0	379.86	42	57.935	8.940
	TG2	186.19	42	34.668	5.349
Pair 3	TG1	211.19	42	45.335	6.995
	TG2	186.19	42	34.668	5.349

Paired Samples Correlations

	N	Correlation	Sig.
Pair 1 TG0 & TG1	42	.552	.000
Pair 2 TG0 & TG2	42	.549	.000
Pair 3 TG1 & TG2	42	.809	.000

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 TG0 - TG1	168.667	50.117	7.733	153.049	184.284	21.811	41	.000
Pair 2 TG0 - TG2	193.667	48.507	7.485	178.551	208.782	25.875	41	.000
Pair 3 TG1 - TG2	25.000	26.729	4.124	16.671	33.329	6.062	41	.000

Discussion

The diagnosis of hypertriglyceridemia is based on TGs fasting blood levels, which are classified as mild to moderate or severe hypertriglyceridemia to forecast the risk of cardiovascular disease and pancreatitis. Patients with PHT should be screened for dyslipidemia and CVD in their families. The Task Force and the Adult Treatment Panel of the National Cholesterol Education Program propose that the first line of treatment for moderate hypertriglyceridemia is a lifestyle

change, while in severe hypertriglyceridemia, a fibrate should be considered first besides lifestyle modification.

Fish oil Omega-3 story is long and evolved with ups and downs dating back to nineteen nineties. The doses which were studied variable i.e., one gram in Italian trials, two grams in Japanese trials, and up to four grams in recent American multinational trials. In the present study, Aqua Marin Omega-3 fish oil containing EPA and DHA

showed a significant reduction of serum TGs after one month and two months. Aqua Marin Omega-3 fish oil seems an efficient intervention for lowering hyper-TGs even with 1082mg doses. Furthermore, it is a relatively inexpensive pharmaceutical agent that

is well tolerated and produces negligible side effects. As a result, it appears that our PHT patients consume omega-3 fatty acids daily to lower their plasma TG3, lowering their risk of cardiovascular, central nervous system, and pancreatitis.

Conclusion

After only one month, omega-3 appears to have a substantial effect on lowering blood TGs levels; however, two months produced a greater improvement in TGs serum concentration. Patients with PHT should begin taking Omega-3 fatty acids as soon as

possible (PHT). Furthermore, it appears that combining lipid-lowering medicines such as statins with lifestyle management is beneficial; nevertheless, more multicenter trials in Libya are needed to assess this hypothesis

Disclaimer

The article has not been previously presented or published, and is not part of a thesis project.

Conflict of Interest

There are no financial, personal, or professional conflicts of interest to declare.

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