Comparison of Non-Fasting and Fasting Lipid Profile in Dyslipidemia Patients

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Abstract

Dyslipidemia, a metabolic syndrome characteristic, includes increased flux of free fatty acids, high density lipoprotein cholesterol, low-density lipoprotein, and triglycerides. One of the main topics of screening and management in adult and child populations has been dyslipidemia

The aim of this study was to evaluate non-fasting and fasting when measuring the lipid profile of patients with dyslipidemia.

This study was performed 80 male of dyslipidemia patients, they were monitored and their lipid profile levels measured during non- fasting were collected after 2 hours of meal, and varying hours of fasting periods includes (4 hours, 6 hours, and 8 hours).

In this study we did not found any significant clinical difference between non-fasting and fasting levels of total cholesterol, and low-density lipoprotein and high-density lipoprotein. Thus, we can use the non-fasting blood samples to estimate lipid profile in follow-up the dyslipidemia patients. When comparing the fasting hours, we observed mean triglyceride for all period of fasting were differences, as compared to the non-efforts fasting state significant differences $P< 0.001$

Finally, there is no need to make fasting lipid profile mandatory. This study suggests that should be made to simplify the sampling of blood by replacing the profile of fasting lipids with the profile of non-fasting lipids.

Keywords: *Total cholesterol, triglycerides, high-density lipoprotein, low density lipoprotein, fasting, non-fasting.*

Introduction

Dyslipidemia, a metabolic syndrome characteristic, includes increased flux of free fatty acids, high density lipoprotein cholesterol, low-density lipoprotein, and triglycerides [(1)].

One of the main topics of screening and management in adult and child populations has been dyslipidemia. In 2008, the prevalence of such a problem was as high as 39 percent for men and 40 percent for women in developing countries [(2)].

In addition, with the raising number of people with dyslipidemia discovered due to efficient screening. Recent recommendations have preferred non-fasting lipid profile assessment [(3)]. Raising patient satisfaction by eliminating separate return visits for laboratory drawings and improving hospital and clinic performance are practical benefits of using non-fasting measurements. Moreover, non-fasting triglycerides may improve cardiovascular risk prediction [(4)]. On the other hand, in fasting samples, classification of dyslipidemias has historically been derived, and cohort studies and clinical trials have generally carried out fasting evaluations [(5,6)].

There are particular difficulties in screening for lipid disorders. Prior to a regular doctor's office appointment, most patients would not have fasted. Therefore, most fasting lipid panels must either be scheduled prior to visits or reviewed for corresponding office visits or

additional outpatient phlebotomy center visits [7].

In our study, we will discuss the variance fasting hours among the lipid profile parameters [total cholesterol, low-density lipoprotein and high-density lipoprotein, triglycerides in dyslipidemia patients

Material and subjects

This study was performed 80 male of dyslipidemia patients, they were monitored and their lipid profile levels measured during non- fasting were collected after 2 hours of meal, and varying hours of fasting periods includes (4 hours, 6 hours, and 8 hours).

The following information was submitted to all patients included in the study:

· Personal history was taken with regard to name, age, gender, residence, special medical behaviors such as smoking, diabetes mellitus, systemic arterial hypertension, prior ischemic incidents, and family history as well.

· For all patients, including general examination, vital signs (blood pressure and pulse) and obesity, clinical examination was performed

· The lipid profile parameters were measured using an automated quantitative COBAS INTEGRA® 400 plus test (from Roche, Germany).

Statistical Analysis

The total clinical data of patients was analyzed to identify the number of hours of food interruption. Continuous variables analysis using SPSS 20. Software (SPSS, Inc., Chicago, IL, USA), and expressed as the mean ± standard error. ANOVA was done to evaluate the differences in these variables. $P \leq 0.001$ was measured to indicate a statistically significant difference.

Rustles

The result of lipid profile illustrated in table 1, the statistical analysis showed no any different significant in mean lipid profile, firstly total cholesterol among different period of fasting in non-fasting (284.40 ± 1.05 mg/dl), fasting for 4 hours (282.36 ± 0.51), fasting for 6 hours (282.40 ± 0.24 mg/dl), and fasting for 8 hours (282.60 ± 0.74 mg/dl) figure 1. Also, high density lipid as the mean in non-fasting (41.60 ± 0.92 mg/dl), fasting for 4 hours (42.80 ± 0.86 mg/dl), fasting for 6 hours (42.80 ± 1.46 mg/dl), and fasting for 8 hours (41.60 ± 0.92 mg/dl) figure 2. In addition, low density lipid as the mean in non-fasting (189.60 ± 0.92 mg/dl), fasting for 4 hours (188.60 ± 0.50 mg/dl), fasting for 6 hours (200.80 ± 0.86 mg/dl), and fasting for 8 hours (188.74 ± 0.60 mg/dl) figure 3.

The mean of triglyceride showed the different significant in in dyslipidemia patients among all period of fasting include non-fasting (235.64 ± 0.16 mg/dl), fasting for 4 hours (210.42 ± 0.20 mg/dl), fasting for 6 hours (200.80 ± 0.86 mg/dl), and fasting for 8 hours (192.00 ± 0.70 mg/dl), the p value less than 0.001figure 4.

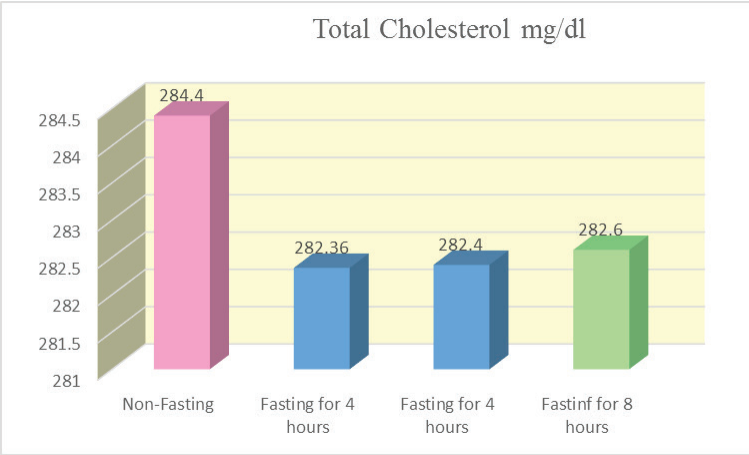

Figure 1 Total cholesterol during the various fasting periods

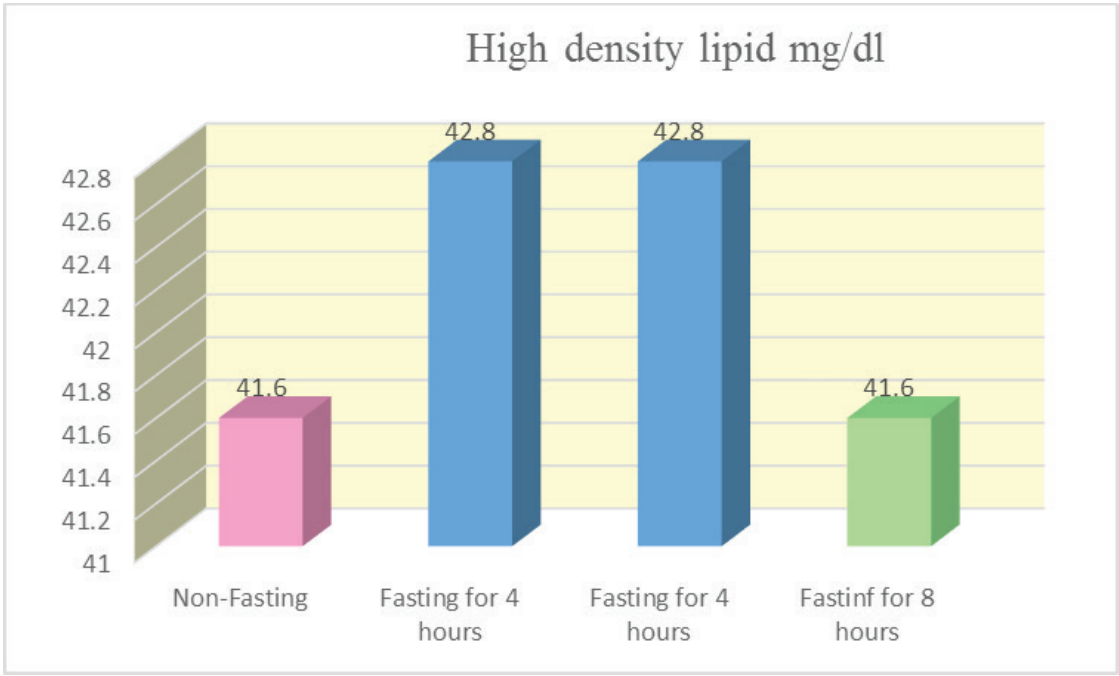

Figure 2 High density lipid during the various fasting periods

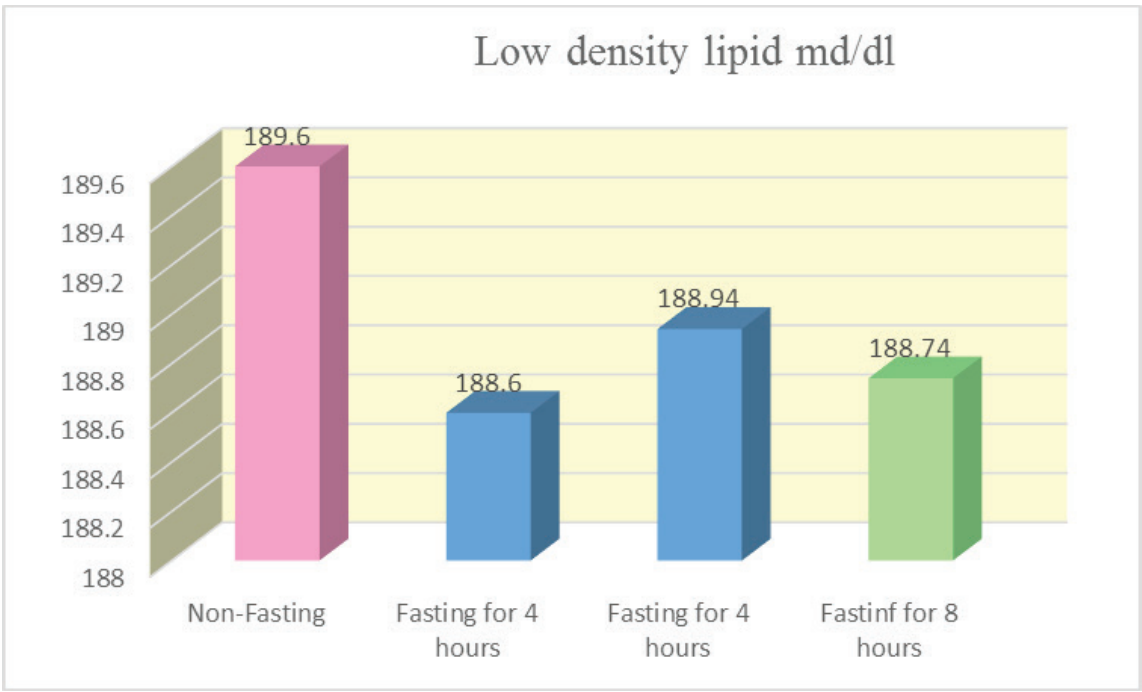

Figure 3 Low density lipid during the various fasting periods

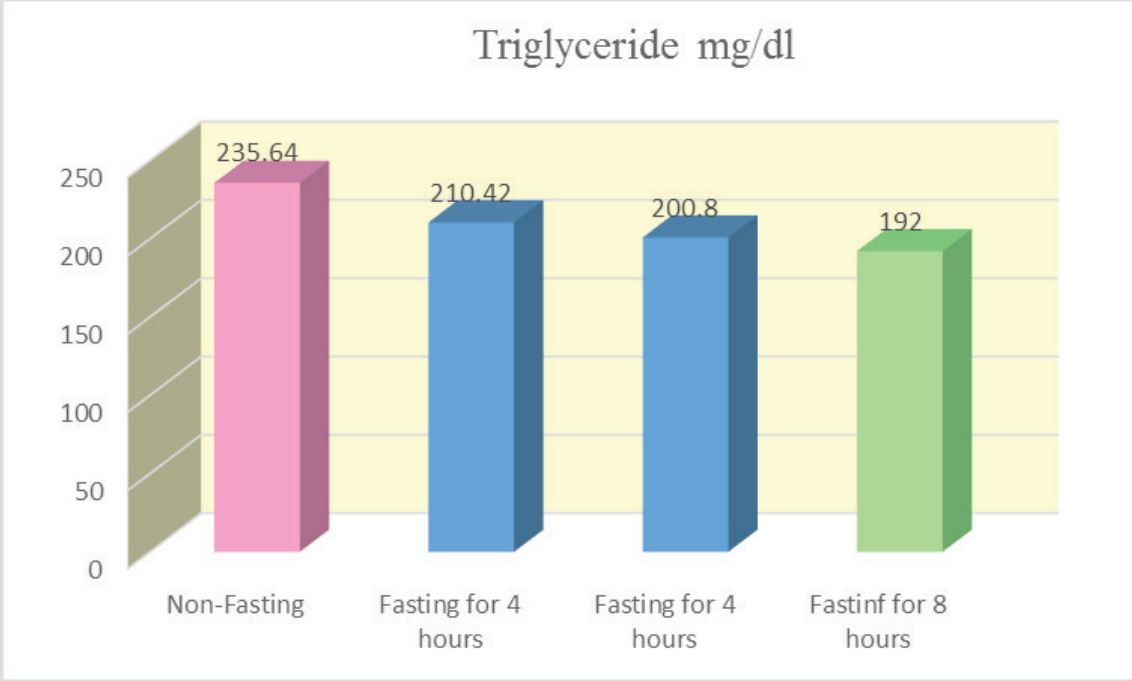

Figure 4 Triglyceride during the various fasting periods

Table. 1 Demonstrating Mean ± Standard error (mg/dl) of different fasting hours versus non fasting in Lipid profile assessment

Type of lipid	Fasting hours		Mean ± SE	Sig
Total C mg/dl	fasting	4	282.36 ± 0.51	N. S
		6	282.40 ± 0.24	
		8	282.60 ± 0.74	
	Non fasting		284.40 ± 1.05	
TG mg/dl	fasting	4	210.42 ± 0.20	Non- fasting vs 4 hours < 0.000 Non- fasting vs 6 hours < 0.000 Non- fasting vs 8 hours < 0.000 4 hours vs 6 hours < 0.000 4 hours vs 8 hours < 0.000 8 hours vs 6 hours < 0.000
		6	200.80 ± 0.86	
		8	192.00 ± 0.70	
	Non fasting		235.64± 0.16	
HDL mg/dl	fasting	4	42.80 ± 0.86	N. S
		6	42.80 ± 1.46	
		8	41.60 ± 0.92	
	Non fasting		41.60 ± 0.92	
LDL mg/dl	fasting	4	188.60 ± 0.50	N. S
		6	188.94 ± 0.3	
		8	188.74 ± 0.60	
	Non fasting		189.60 ± 0.92	

Discussion

In this study we did not found any significant difference between fasting and non-fasting levels of total cholesterol, low and d high density lipoprotein. Thus, we can use the non-fasting blood samples to estimate lipid profile in follow-up the dyslipidemia patients.

Lipid profiles are routinely measured for risk assessment in preventing atherosclerosis disease**.** It is usually done in the fasting blood sample. Researches are in process to replace the fasting blood sampling with that of non-fasting sample to simplify the blood sampling, societies & laboratories adapted non-fasting lipid profiles. Non-fasting lipid testing has been the clinical routine in Denmark since 2009, based on the Danish Society for Clinical Biochemistry's recommendation that all laboratories in Denmark use random non-fasting lipid profiles as a standard, thus giving clinicians the option of re-measuring fasting triglyceride concentrations if non-fasting values are 4 mmol/L (350 mg/dL) [9,10]. In addition, the UK NICE guidelines have allowed non-fasting lipid testing since 2014 in the primary prevention setting [11]. However, the use of non-fasting samples over fasting samples for calculating the lipid profile, however has advantages. [12,13]. Therefore, the change in fasting hours would be much simpler for people worldwide if a lipid profile could be taken after few hours of postprandial [12].

When comparing the fasting hours with non-fasting we observed mean triglyceride showed the differences among a all period of fasting, it increased greatly in non-fasting state as compared to the fasting state significant differences P< 0.001 ([13,14,15]. The removal of fasting hours as a general requirement for triglyceride testing could dramatically improve patient convenience without significantly changing the results of the test [14,15].

They explained that the increased triglycerides were a correction to albumin levels in response to normal food intake and hence a correction to hemodilution due to fluid intake. The fluctuations in these amounts are therefore more likely due to the consumption of food rather than the intake of fluid. Therefore, there was no substantial clinical difference between total cholesterol, HDL, and LDL levels between fasting and non-fasting. These findings are in line with those of Langsted *et al.*[11].,

Since non-fasting can compromise the accuracy of certain types of hyperlipidemia diagnosis, we proposed that laboratories and organizations should also provide clinical-based measurement of fasting triglycerides, as in the case of very high concentrations of non-fasting triglycerides. It was concluded by Cohn *et al*. [14]. & Mihas et al [15]. The reason that preferred fasting lipid profiles is the rise in triglyceride level seen through a fat tolerance assessment. On the other hand, the Fried Ewald equation, which has been assumed to be greatly influenced by food consumption, also measures LDL cholesterol. Therefore, if this equation is used, some underestimation of LDL cholesterol can occur when chylomicrons are present. [16]. In addition to that non-fasting state due to the liberal intake of fluids, plasma LDL cholesterol levels can slightly decline and thus lead to a minor misclassification of cardiovascular risk, as well as errors in initiating or altering lipid-lowering medication, especially for diabetic subjects. [17,18,].

Conclusion

Finally, there is no need to make fasting lipid profile mandatory. This study suggests that efforts should be made to simplify the sampling of blood by replacing the profile of fasting lipids with the profile of non-fasting lipids.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Bilad AlRafidain University College and all experiments were carried out in accordance with approved guidelines.

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