

Estimation of Platelet Parameters and Liver Enzymes During the Ramadan Fasting among Healthy Subjects

Sağlıklı Kontrollerde Ramazan Orucu Sırasında Trombosit Parametrelerinin ve Karaciğer Enzimlerinin Tahmini

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ABSTRACT

Background/aim: The aim of this study is to investigate Platelet Parameters and liver enzymes during the fasting in Ramadan month on among healthy subjects.

Materials and methods: Twenty eight subjects (20 female and 8 male) participated in this study. Blood samples from healthy subjects were collected before 5 days of the fasting of Ramadan month and 28th day of the fasting of Ramadan month. Platelet Parameters were analyzed by using fully automatic hematological analyzer and liver enzymes were analyzed spectrophotometer (Biolab kits).

Results: The study in female subject discovered no difference in MPV, PCT, ALT activity, and AST activity, while PLT count, PDW and LPCR decreased during the fasting of Ramadan month. In other hand, the study in male subject discovered a decrease in platelet parameters (PLT, MPV, PDW, PCT and LPCR), while ALT activity increased during the fasting of Ramadan month. Also this study in male subject discovered no difference in AST activity during the fasting of Ramadan month.

Conclusions: This study shows that fasting in the Ramadan month had effect on platelet parameters in males while had effect on PLT, PDW and LPCR in female health. This study shows fasting Ramadan had effect on ALT activity in male.

Key Words: Ramadan fasting, platelet counts, parameters related to platelet, liver enzymes.

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ÖZET

Amaç: Bu çalışmanın amacı Ramazan ayında oruç sırasında trombosit parametrelerini ve karaciğer enzimlerinin sağlıklı kişiler arasında incelenmesidir.

Yöntem: Çalışmaya yirmi sekiz (20 kadın ve 8 erkek) katılmıştır. Sağlıklı deneklerden alınan kan örnekleri Ramazan ayı oruçundan 5 gün önce ve Ramazan ayı oruçunun 28. gününden önce toplanmıştır. Trombosit Parametreleri tam otomatik hematolojik analiz cihazı kullanılarak analiz edildi ve karaciğer enzimleri spektrofotometre (Biolab kitleri) ile analiz edildi.

Bulgular: Kadın denekte yapılan çalışmada MPV, PCT, ALT aktivitesi ve AST aktivitesi arasında fark bulunmazken, Ramazan ayı oruçunda PLT sayısı, PDW ve LPCR azaldı. Öte yandan erkek denekte yapılan çalışmada trombosit parametrelerinde (PLT, MPV, PDW, PCT ve LPCR) azalma görülürken, Ramazan ayı oruçlarında ALT aktivitesi artmıştır. Ayrıca erkek denekte yapılan bu çalışma, Ramazan ayının oruçunda AST aktivitesinde hiçbir fark bulamadı.

Sonuç: Bu çalışma Ramazan ayında oruç tutmanın erkeklerde trombosit parametrelerini etkilediğini, kadın sağlığında PLT, PDW ve LPCR'yi etkilediğini göstermektedir. Bu çalışma oruç Ramazan'ın erkeklerde ALT aktivitesi üzerinde etkili olduğunu göstermektedir.

Anahtar Sözcükler: Ramazan oruç, trombosit sayısı, trombosit ile ilgili parametreler, karaciğer enzimleri.

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INTRODUCTION

The Fasting in Ramadan month is one of important worships in an Islamic religion. Religious Muslims should abstain sustenance and drink, intercourse, oral remedy, intravenous fluids and supplements in Ramadan month from sunrise to sunset every year in the different season according to a lunar calendar, also under difference condition around the world. Fast during the Ramadan month make a change of a lifestyle like time of sleep, quality and quantity of food, hours and time work etc. This altered lifestyle in Ramadan as a special month in each year might be an effect on multi-metabolism of the body (1), which could prompt to impact on physiology, which could be considered as a platelet Parameter. Also fasting during Ramadan leads to a change in liver enzymes activity due to the liver is the central organ for all major metabolic pathways.

However, there are few studies evaluated a change in Platelet Parameters during the fasting of Ramadan month in both genders while there are many studies evaluate some parameters related to platelet among the fasters in the Ramadan month (2-13). In another hand, there are few studies evaluated activities of ALT and AST among the fasters in the Ramadan month (14-20). The previous studies of Platelet Parameters and also Liver enzymes are controversial.

The methodologies in previous studies such as a compared before a fast Ramadan and during a fast of Ramadan month, measurement of these Parameters for each gender and also samples characteristics such as student and single are few. Therefore, the present study investigates the effect of Fasting during Ramadan month on of platelet Parameters and Liver enzymes in single student graduate.

METHODS*Subject*

The target study was single females and males who are a student at the college of nursing. Their physical Activities during the month of Ramadan were a combination of writing an exam in college and study at their house. This Study was conducted in the month of Ramadan during June and July / 2016, and the average duration of fasting was around 16 hours a day. The mean climate temperature and humidity were 23°C and 22%, and 25.5°C and 21% during June and July respectively. There were no special nutritional regimens and recommendations during the whole study. To maintain a sample of homogeneity, all participants were chosen from the same living community, Rania city, Iraq, a student in the College of Nursing, so that the socioeconomic levels were highly similar. 28 subject (20 female and 8 male) students with age range from 19 to 23 years who were a fast during the Ramadan month were included in the current study. The detailed history of the age, gender, marital status, family history and drug history were taken from the subjects.

Table 1. Difference of Platelet parameters in Female

Parameter	Unit	Time	Mean	Std. Error Mean	Sig.
PLT	(10 ⁹ /l)	Pre-Ramadan	148.1250	10.42222	0.036
		During Ramadan	147.6250	15.38777	
MPV	(fL)	Pre-Ramadan	9.7125	0.26011	0.073
		During Ramadan	9.0125	0.15634	
PDW	(fl)	Pre-Ramadan	12.0625	0.37793	0.005
		During Ramadan	11.6125	0.26148	
PCT	(%)	Pre-Ramadan	.1400	0.00964	0.018
		During Ramadan	.1275	0.01306	
LPCR	(%)	Pre-Ramadan	26.2250	1.85595	0.010
		During Ramadan	22.2125	1.35376	

Subjects having any acute or chronic disease such as diabetes, hypertension, metabolic disorders or any medication, also pregnancy or lactation were excluded from the study.

4mL Blood samples were collected by venipuncture from forearm vein that Blood samples were from each volunteer before 5 days before the beginning of the Ramadan month and 28th day of the Ramadan month at a Physiology Laboratory in the nursing college during 4 pm.

Estimation of platelet parameters

2.5 mL Blood sample was poured into a tube containing K2EDTA. All samples were checked for clots, hemolysis and mixed well before analysis. The evaluation of platelet parameters (PLT, MPV, PDW, PCT, LPCR) were analyzed by system Swelab-Alfa automated hematology analyzer.

Estimation of Liver enzymes

The rest of 1.5 mL blood sample was poured into another test tube. The test tubes were kept in slanting position till the formation of a clot. Centrifuging the blood at 3000 rpm for 5 minutes at room temperature, serum was separated to taken into a test tube. The serum stored at (-20 C) until analyzed as early as possible. Alanine Transaminase (ALT) activity and Aspartate Transaminase (AST) activity were determined in serum by spectrophotometer (Biolab kits).

Ethical consideration

This review was approved by the Ethical Committee of the College of Nursing, Iraq.

Data analysis

Statistical Package for Social Science (SPSS) V20 was used to Statistical analysis of the present study. Mean ± Std. Error (Standard Error) was expressed in this study. The comparison between a mean of the group in this study was performed by paired sample T-test. A significant value was taken P < 0.05 for all results.

RESULTS

According to Table (1) showed Platelets (PLT) counts, Platelet Distribution Width (PDW) and Platelet-Large Cell Ratio (P-LCR) were lower among females during the fasting of Ramadan month. In another hand, Platelet Crit (PCT) and Mean Platelet Volume (MPV) were no difference significant in comparison the fasting of Ramadan month with before the fasting Ramadan month as the table (1) demonstrated. Based on a table (2), Alanine Transaminase (ALT) activity and Aspartate Transaminase (AST) activity were insignificant a change among females during the fasting of Ramadan month. Table (3) showed PLT, MPV, PDW, PCT and LPCR were a decrease among males in the fasting of Ramadan month. ALT activity was higher while AST activity was non-significant change in males fasted during the Ramadan month as Table (4) showed.

Table 2. Difference of Liver enzymes in Female

Parameter	Unit	Time	Mean	Std. Error Mean	Sig.
ALT	IU/L	Pre-Ramadan	13.8750	2.18122	0.328
		During Ramadan	21.8750	3.20051	
AST	IU/L	Pre-Ramadan	19.0250	1.91135	0.357
		During Ramadan	14.8000	2.27411	

Table 3. Difference of Platelet parameters in male

Parameter	Unit	Time	Mean	Std. Error Mean	Sig.
PLT	(10 ⁹ /l)	Pre-Ramadan	223.2500	15.86852	0.043
		During Ramadan	205.2500	13.04342	
MPV	(fl)	Pre-Ramadan	8.8050	0.46456	0.283
		During Ramadan	8.8150	0.17863	
PDW	(fl)	Pre-Ramadan	11.3650	0.23286	0.000
		During Ramadan	11.3250	0.24888	
PCT	(%)	Pre-Ramadan	.2090	0.01357	0.773
		During Ramadan	.1745	0.00983	
LPCR	(%)	Pre-Ramadan	23.4200	1.32235	0.000
		During Ramadan	20.3750	1.31729	

Table 4. Difference of Liver enzymes in male

Parameter	Unit	Time	Mean	Std. Error Mean	Sig.
ALT	IU/L	Pre-Ramadan	11.3750	3.60029	0.038
		During Ramadan	21.3125	3.09513	
AST	IU/L	Pre-Ramadan	22.7500	2.20187	0.449
		During Ramadan	17.3250	3.76595	

DISCUSSION

Fasting during the Ramadan month has positively associated to be a reason for various major change morphological and biochemical in individuals. This study compared the platelet parameters and hepatic function before the fasting of Ramadan month and during fasting the Ramadan month. This study showed alteration in platelet parameters and liver enzymes such as PLT and PDW in both genders and also ALT in the male during the fasting of Ramadan month as compared with before fasting of the Ramadan month.

In this study, platelet counts decreased slightly during the fasting of the Ramadan month but this reduction was within the normal range in both genders. The previous studies found a statistically significant decrease in platelet count during the fasting of the Ramadan month (2, 5, 6). In contrast to the present finding, other studies have observed significantly an increase in platelet counts during the fasting of the Ramadan month (1,7,8).

However, some studies have shown no difference in the platelet counts during the fasting of the Ramadan month (4, 9, 10, 11, 12). Platelet counts decrease during Ramadan month due to a reduction in iron levels during Ramadan fasting month (2, 5).

Mean platelet volume (MPV) was no difference during the fasting of the Ramadan month as compared with the pre-Ramadan month in both genders. Also, another study has shown no statistical differences in MPV during Ramadan month in both genders during the fasting of the Ramadan month and after fasting of the Ramadan month (12). In contrast to this study, nasiri with colleagues found low MPV in during fasting the Ramadan month and increasing after fasting of the Ramadan month in both genders (13).

Platelet Larger Cell Ratio (LPCR) and platelet distribution width (PDW) decrease in both genders during Ramadan. In this study, the mean plateletcrit (PCT) decreased during Ramadan in a male while was no alteration during Ramadan in a female.

Aspartate transaminase (AST) activity and Alanine transaminase (ALT) activity were no significant change in both genders except ALT activity increased in the male during the fasting of the Ramadan month. The previously published studies have found a decrease in activity of AST and ALT in Ramadan fasting (5, 14, 16, 17). Another Study has demonstrated no change in activities of AST and ALT among 15 healthy male in the Ramadan month (2). In another study showed a decrease in activity of ALT and an increase in activity of AST during the Ramadan as compared to pre-Ramadan (15). Nobili and colleagues in their clinical pathological study among children reported improved activity levels of ALT significantly (18). Some Researchers found statistically no change in both parameters after Ramadan fast (10, 19). Sadiya and colleagues revealed no a significant change in both parameters during the Ramadan fasting month (20).

These controversial results may be due to dehydration, weather, nutrition style and Dietary habits during Ramadan. However, there is a scarcity of the studies that evaluate the platelet parameters such as MPV, PDW, PCT and LPCR during the fasting of Ramadan month. In this study, fasting in Ramadan month healthy was accompanied by significant and considerable effects on platelet parameters with a significantly decreased mean platelet parameters including PLT, MPV, PDW and PCT value during Ramadan fasting in comparison with before Ramadan. Further studies are required to explain these parameters changes in platelet following fasting.

Conflict of interest

No conflict of interest was declared by the authors.

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