

*

(2008/10/13 2008/6/23)

CE

)

TC

)

(PL

MDA

HDL-C

(GSH

)

65-41

(

()

.BF₃/Methanol

n₆

n₃/n₆

n₃

/ /

2008 23-22

*

	(HDL-C)	(TC)	
	.	.	HDL-C/TC
	())
()	.
	.		
	()
TC	n ₆		
HDL-C/TC	HDL-C		
	n ₃	n ₆	
	HDL-C		TC
			: _____

The Relationship of Fatty-Acid Composition of Female Serum to the Level of some Biochemical Variables and the Possibility of Myocardial Infarction

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ABSTRACT

The present study investigates the relationship between fatty-acid composition (in cholesterol ester and phospholipids), the biochemical parameters (total cholesterol, TC; high density lipoprotein-cholesterol, HDL-C; uric acid, malondialdehyde, MDA and glutathione, GSH), the possibility of myocardial infarction and diabetes mellitus in women aged 41-65 years.

Serum samples were divided into two parts. Lipids were extracted from the first part by organic solvents and their compounds were separated by thin-layer chromatography. Cholesterol ester and phospholipids were hydrolyzed and the produced fatty acids were re-esterified by BF₃/methanol. Fatty acid-methyl esters were separated and identified by capillary gas chromatography. It was found that patient groups exhibited a higher level in n₆ fatty acids but a lower level in n₃ fatty acids and in the ratio of n₃/n₆ compared with the control group. The second part of serum was used to estimate the biochemical

parameters. Uric acid, TC and MDA showed an increase in their levels while HDL-C, GSH and the ratio of HDL-C/TC exhibited a decrease in their levels in the patient groups.

It was concluded that the increase in n₆-fatty acids, TC, MDA (the main product of lipid peroxidation) and uric acid(one of the risk signs of having heart artery disease) as well as the decrease in GSH, HDL-C, HDL-C/TC ratio, n₃-fatty acids and n₃/n₆ fatty acids ratio reflect a negative signs of myocardial infarction and diabetes mellitus.

Key words: essential fatty acids, myocardial infarction, diabetes mellitus, cholesterol.

(CHD) Coronary Heart Diseases

(2000 ,) (Blum and Cannon, 1998)

Myocardial (AL-Tamer and Mahmood, 2004)

(Montgomery *et al.*, 1990) Infarction

(Vasilenko and Grebenev, 1987)

ox- Low-Density Lipoprotein (LDL)

LDL

Scavenger Receptors

LDL (Rosenson, 2004)

(Singh *et al.*, 2004)

,LDL

(Al-Tamer and Mahmood, 2006)

(Phillips *et al.*, 2004)

(Walsh *et al.*, 2000)

)

. 65-41

(

.

95

68

60

. 65-41

.

.

5

37

.

. 18 -

.(Habboush, 1982)

. MERCK

0.25

,

.(AL-Tamer and Mahmood, 2004) 2:20:80

nondestructive reagent

2,7-dichlorofluorescein

.(Ma *et al.*, 1995)

:

310

.

.....

BF₃/Methanol

. 45 .

.(Morrison and Smith, 1964)

Capillary Gas

-

Chromatography

(CGC) Capillary Gas Chromatography

Laboratorium Fredersdorf GmbH

. /

(MDA) Malondialdehyde

.(Akande and Akinyinka, 2005)

(AL-Zamely *et al.*, 2001) ()

5,5`-dithio bis-2-nitrobenzoic acid

(SH group)

(DTNB)

Allantoine

./Syrbio

.(Annion and Giese, 1976)

.(Syrbio)

.(Robyt and White, 1987)

/Bicon

.(Wieringa, 2001)

(HDL-C)

HDL

.(Tietz, 1999)

) , 65-41 (.CGC

.(Valsta, 1995; Smedman *et al.*, 1999)

.n3 , n6

2,1

(Hu *et al.*, 2001)

(Kris-Etherton *et al.*, 2001; Hu *et al.*, 2001)

desaturation

.(Enas *et al.*, 2003)

.(Sacks, 1994)

(Kris-Etherton *et al.*, 2001)

(HDL-C)

(Hu *et al.*, 2001)

:1

المصابيات باحتشاء العضلة القلبية	النساء المصابيات باحتشاء العضلة القلبية وداء السكر	النساء الطبيعيات	الاحماض الدهنية
0.11	0.12	0.03	10:0
0.0	0.01	0.0	11:0
0.08	0.09	0.02	12:0
0.0	0.0	0.0	13:0
0.72	1.16	0.74	14:0
0.02	0.02	0.02	15:0
10.06	9.38	10.37	16:0
0.0	0.0	0.0	17:0
0.8	0.95	0.87	18:0
0.03	0.05	0.01	20:0
0.0	0.01	0.02	22:0
0.0	0.0	0.01	23:0
0.0	0.0	0.01	24:0
11.82	11.79	12.1	المجموع %
			أحادية الأصرة المزدوجة
0.0	0.02	0.0	Cis 14:1n
0.02	0.0	0.0	15:1n5
0.35	0.26	0.72	16:1n7
0.0	0.0	0.0	17:1n7
13.0	12.17	16.68	Cis 18:1n9
0.01	0.02	0.0	Cis 18:1 n7
0.0	0.0	0.03	Cis 18:1n 12
0.04	0.02	0.04	Cis 18:1 n9 trans
0.0	0.01	0.01	Cis 22:1 n9
13.42	12.5	17.48	المجموع (%)
			متعددة الأواصر المزدوجة
0.0	0.0	0.0	16:2 n4
66.63	65.63	60.24	cis 18:2n6
0.31	0.25	0.55	Cis 18:3 n3
1.37	1.82	2.07	20:3n6
0.02	0.03	0.0	20:2n6
5.55	7.19	5.54	Cis 20:4 n6
0.31	0.38	0.81	Cis 20:5 n3
0.0	0.0	0.0	Cis 22:2
0.0	0.08	0.04	Cis 22:5 n3
0.57	0.38	0.83	Cis 22:6 n3
73.57	74.67	67.85	n6
1.19	1.09	2.23	n3
0.016	0.015	0.033	n3/n6

:2

			المشبعة
0.07	0.09	0.07	10:0
0.0	0.0	0.0	11:0
0.11	0.1	0.05	12:0
0.0	0.0	0.0	13:0
0.82	1.29	0.31	14:0
0.0	0.01	0.01	15:0
24.15	23.22	23.33	16:0
0.01	0.0	0.02	17:0
12.34	11.13	12.86	18:0
0.02	0.02	0.0	20:0
0.0	0.02	0.0	22:0
0.0	0.0	0.0	23:0
0.03	0.0	0.0	24:0
37.55	35.88	36.65	المجموع %
			أحادية الاواصر المزدوجة
0.0	0.01	0.02	14:1 cis n
0.0	0.0	0.0	15:1n5
0.39	0.28	0.49	16:1n7
0.02	0.0	0.0	17:1n7
7.78	9.19	11.85	Cis 18:1n9
0.0	0.01	0.0	Cis 18:1 n7
0.02	0.01	0.0	Cis 18:1n 12
0.04	0.04	0.11	Cis 18:1 n9 trans
0.0	0.01	0.04	Cis 22:1 n9
8.25	9.55	12.51	المجموع (%)
			متعددة الاواصر المزدوجة
0.0	0.0	0.0	16:2 n4
36.46	39.03	28.93	cis 18:2n6
0.18	0.12	0.25	Cis 18:3 n3
3.48	2.96	3.31	20:3n6
0.03	0.01	0.03	20:2n6
8.86	6.45	10.1	Cis 20:4 n6
0.39	0.45	1.0	Cis 20:5 n3
0.01	0.0	0.0	Cis 22:2
0.01	0.01	0.05	Cis 22:5 n3
3.65	4.07	4.81	Cis 22:6 n3
49.01	48.45	42.37	n6
4.23	4.65	6.11	n3
0.086	0.096	0.144	n3/n6

.....

n3 n6

n3

(Holub, 2002)

(EPA) Eicposapentaenioic (DHA) Docosahexaenioic acid

EPA

(TxA2) Thromboxane A2

) AA-TxA2

(AA) Arachidonic acid

DHA

(

.TxA2 (AA)

cyclo-oxygenase

n3

erythrocyte-

.deformability

nitric oxide

n3

.(Holub, 2002; Connor, 2000)

Agosti, 2003

EPA

n 6

(n 6

) AA

n 6

. (Holub, 2002)

.(Benatti *et al.*, 2004; Mete *et al.*, 1999) n3

n3 / n6

2 1

.(AL-Juraisy, 2002; Giacometti *et al.*, 2005)

n3/ n6

n3 / n6

(Minihane *et al.*, 2002; Von-Schacky, 2000)

.(Benatti *et al.*, 2004)

:

3

:3

P*				
	(60)	(68)	(95)	
SD ± Mean				
0.05	0.779 ±3.960	0.574 ± 3.616	0.319± 2.231	/
0.05	2.401± 0.618	3.556±1.808	8.69±0.263	/
0.05	0.907 ± 8.65	0.880 ± 6.490	568. 0± 5.450	100/
0.05	1.019± 7.277	8.458± 1.029	1.101±8.837	100 /
0.01	16.75± 252.4	21.902± 241.21	4.466± 125.79	100/
0.05	1.593 ± 32.13	3.04 ± 33.97	1.982± 39.21	100 /
0.05	0.0146± 0.134	0.095 ± 0.127	0.069 ± 0.312	/

p<0.001

.....

MDA

: .

,LDL-C

.(Das *et al.*, 2000)

(Glycosylation)

.(Ataly and Laaksonen, 2002)

: .

(Reperfusion of blood flow)

.(Simmi, 2003 ; Raghuvanshi *et al.*, 2005)

()

(glutamyl cysteine synthetase)

()

.(Powell *et al.*, 2002)

3 : .

.(Alderman and Aiyer, 2004; Hayden, 2002)

.(Reyes and Leary, 2003)

: .

Nephropathy

.(Oguntibeju and Fafunso, 2002)

3 :

.(Hu *et al.*, 2001; Enas *et al.*, 2003)

n3

(Hydroxy –methylglutaryl-CoA reductase) (HMG-CoA reductase)

Statins

n3

2 1

.(Levine, 2003)

n3

n6

HMG-CoA

(

AA

)

.n3

reductase

n6 n3

n3/n6

.(AL-Juraisy, 2002)

(Suryawanshi *et al.*, 2006)

(2 1)

n6 n3

HDL-C

:HDL

n3

.(Hu *et al.*, 2001; Stark *et al.*, 2000) HDL-C

EPA,DHA

HDL -C

VLDL

HDL

apo A1

HDL

HDL

.(Pikto-Pickiewicz *et al.*, 2005)

:HDL-C/TC

HDL-C

LDL-C

HDL-C/TC

(Murray *et al.*, 1999)

.(Gupta and Kapse, 2001)

2000

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