

VARIATIONS IN LIPID PROFILE DURING FASTING IN RAMAZAN IN HEALTHY MALE ADULTS

Pages with reference to book, From 242 To 243

Kamran Aziz (Department of Biochemistry, Allama Iqbal Medical College, Lahore.)

Riaz Javed Raja (Department of Pathology, King Edward Medical College, Lahore.)

Shah Mohammed Marri (Department of Pathology, Postgraduate Medical Institute, Lahore.)

Ramazan fasting, one of the pillars of Islam, extends from dawn until sunset. In high northern latitudes, depending on month of the year, period of fasting can be longer. During this period individuals abstain from eating, drinking, oral medication, intravenous fluids and nutrients. The calorie gap during fasting is usually bridged by taking extra milk, sweets, fried snacks and dates. The physiological and biochemical effects of fasting are mild and reversible¹. This paper describes the effect of Ramazan fasting on serum lipids profile in healthy adult males.

SUBJECTS, METHODS AND RESULTS

Twenty-five healthy, non-obese, non-smoker adult male volunteers who observed fast during the whole month of Ramazan were included in the study. Their ages ranged between 30-45 years. Blood samples were collected aseptically by venipuncture from all subjects before Ramazan fasting and then every week for 4 weeks just before Iftar (breaking fast) time and one sample after Ramazan. Sera were analyzed for triacylglycerols², cholesterol³, HDL-C⁴ and VLDL⁵. Serum triacylglycerols and cholesterol levels decreased significantly in first (R1) and third (10) weeks of Ramazan. However, post-Ramazan levels (Rp) reverted back to prefasting levels (Table I).

TABLE I. Changes in serum cholesterol and triacylglycerol concentration observed in the subjects fasting during Ramazan. The comparison is between pre and post fasting levels.

		R0	R1	R2	R3	R4	Rp
Cholesterol	Mean	175.22	159.46	155.70	148.44	146.09	183.83
	±S.D.	±22.59	±31.47	±42.76	±42.92	±35.96	±27.92
			P>.05	P>.05	P<.05	P<.05	P>.05
TAG	Mean	109.16	85.50	84.32	94.74	95.74	121.97
	±S.D.	±26.58	±23.70	±22.83	±23.34	±27.82	±34.84
			P<.05	P<.05	P<.05	P<.05	P>.05

Legend: R = Ramazan, O = before, 1, 2, 3 and 4 = first, second, third and fourth weeks, P = post. Concentration = mg/dl, TAG = triacylglycerol.

Sustained increase of the protective factor (HDL-C) alongwith decreasing risk factor (LDL-C) during last week of Ramazan (Table II)

TABLE II. Gradual increase in the levels of serum high density, low density and very low density lipoproteins during and after fasting in Ramazan with level of significance.

		R0	R1	R2	R3	R4	Rp
HDL-C	Mean	36.78	39.60	38.68	39.97	43.88	44.90
	±S.D.	±6.94	±6.74	±8.31	±7.75	±7.93	±7.21
			P>.05	P>.05	P>.05	P<.05	P<.05
LDL-C	Mean	136.67	153.58	141.33	126.12	159.64	227.79
	±S.D.	±80.23	±78.48	±61.72	±61.64	±74.95	±66.76
			P>.05	P>.05	P<.05	P>.05	P<.05
VLDL	Mean	139.13	139.43	131.77	133.10	116.14	150.24
	±S.D.	±69.91	±71.91	±68.60	±75.40	±76.21	±83.94
			P>.05	P>.05	P>.05	P<.05	P>.05

Legend: R = Ramazan, O = before, 1, 2, 3 and 4 = first, second, third and fourth week and p = post. concentration = mg/dl.

HDL-C = high density lipoproteins cholesterol

LDL-C = low density lipoproteins cholesterol

VLDL = very low density lipoproteins

are also reflected in decreasing ratio, i.e., total- cholesterol/HDL-cholesterol and LDL cholesterol/HDL-cholesterol (Table III).

TABLE III. Adjustments in the ratios of LDL-C/HDL-C observed in fasting subjects during Ramazan, along with rapidly adjusting VLDL/HDL-C ratios suggesting improved tri-acylglycerols transport and the declining total/HDL-C ratios reducing high risk score with reference to hypertension.

		R0	R1	R2	R3	R4	Rp
LDL-C/HDL-C	Mean	3.78	3.95	3.77	3.31	3.84	5.22
	± S.D.	±2.22	±1.95	1.60	±1.77	±2.10	±1.77
VLDL/HDL-C	Mean	3.95	3.65	3.52	3.47	2.72	3.38
	± S.D.	±2.12	±1.99	1.84	±2.10	±1.72	±1.83
Total-C/HDL-C	Mean	4.94	4.13	4.16	3.83	3.43	4.19
	± S.D.	±1.26	±1.00	±1.42	±1.35	±1.04	±0.93

COMMENTS

Slight increase in cholesterol level was observed in 36 healthy, fasting male volunteers during Ramazan⁶. In another study increased cholesterol was in the LDL and VLDL fractions⁷. Triglycerides were increased with an increase in VLDL-TG while APO CII and APO III were significantly decreased⁷. Raised lipid levels in Ramazan may also be due to large evening meal or increased intake of sweets and fats¹. Contrary to these findings cholesterol, LDL and VLDL concentrations declined during fasting, cholesterol specially showed a significant lowering during the fourth week whereas HDL cholesterol levels regttered an increase in this study. The VLDL/HDL-C, LDL-C/HDL-C and total-C/HDL-C ratios also changed during fasting and were found to be related to the reduced cholesterol levels. Thus a positive relationship was observed between fasting in Ramazan and lowering of the serum cholesterol levels with subsequent reduction in LDL-C and rise in HDL-C. Variation in lipid levels observed in different series may be related to dietary changes, working pattern and the duration of fasting in various countries.

REFERENCES

1. Sulimar , R.A. Ramadan fasting: Medical aspects in health and disease. Ann. saudi Med., 1991;11:637-41.
2. Tri ler. P. Enzymic colourimetric estimation of triglycerides by glycerol phoaphatasephenol oxidsse method. Ann. Clin. Biochem., 1969;6:24-27.
3. Roeschlsu, P., Bernt, B. and Oruber, W. Enzymic determination of total cholesterol by cholesterol esterase-per-oxidase method. 3. cnn. Chem. Biochem., 1974;12:403.
4. Burstein, M. and Scholnick, H.R. Lipoprotein-polyamin-metal interactions. Adv. Lipid Res., 1973;2:67-108.
5. Moide, A., Kswai, T. and Kubots, A. Analysis of serum lipoproteins by precipitationwith heparin and calcium ions. Jpn. J. Clin. Pathol., 1975;21:82-91. Special issue.
6. El-Hszmi, MAP., Al-Faleh, F.Z. and Al-Mofleh, I.A. Effect of Ramadan fasting on value of haematological and biochemical parameters. Saudi Med. J., 1987;8:171-76.
7. Shoukry, M.I. Effect of fasting in Rsmdsn on plasma lipoproteins and apoproteins. Saudi Med.J., 1986;7:561-65.