Lipid Profile Among Diabetics in Al-Ramadi City, Iraq

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ABSTRACT:

BACKGROUND:

Hyperlipidemia is a strong predictor risk of cardiovascular events. There are insufficient data on the lipid profile in diabetics in Iraq. This study was carried out to determine the lipid profile among diabetics in Al-Anbar governorate.

MATERIALS:

A total of 136 diabetics (116 were with type 2 diabetes and 20 were with type 1 diabetes) attending Al-Ramadi general hospital, Al-Anbar, were included in the study. Total cholesterol, triglyceride (TG), high density lipoprotein (HDL), low density lipoprotein (LDL) and very low density lipoprotein (VLDL) were estimated.

RESULTS:

Elevated total cholesterol, HDL, LDL, VLDL and TG were detected among patients with type1 and type2 diabetes. Only level of TG was associated with the duration of type2 diabetes, while levels of LDL, VLDL and HDL were significantly associated with duration of type 1 diabetes.

CONCLUSION:

Lipid and diabetes awareness program for Iraqi population should be applied in an attempt to improve the overall health status of Iraqi population.

KEYWORDS: Type1 diabetes, Type2 diabetes, Hyperlipidemia, Al-Anbar governorate

INTRODUCTION:

Diabetes is associated with a marked increase in the risk of coronary heart disease [1,2]. Hyperlipidemia is a strong predictor of risk of cardiovascular event in diabetics [3,4]. Recently, it was suggested that all diabetics could be treated as if they had prior coronary heart disease [4-6]. Prior to 1990, Iraq was advancing through the epidemiological transition from infectious diseases to chronic and degenerative disorders. The country currently suffers from a double burden [7]. A survey in 1979 revealed a diabetes prevalence of 5% in rural area [8]. The current prevalence is unknown [7]. There are insufficient data on the lipid profile of diabetics [9]. The lack of information on diabetic patients motivated us to determine the lipid profile among diabetics in Al-Anbar governorate.

MATERIALS AND METHODS:

A total of 136 diabetic patients attending Al-Ramadi general hospital, Al-Anbar- Iraq, were included in this study for the period 1st November 2003 to 1st October 2004. Diabetic patients were diagnosed by physician. All diabetics were treated by anti-diabetic drugs and they were not treated by lipid lowering agents. The duration of diabetes was classified as ≤ 5.9, 6- 9.9 and ≥ 10 years. Out of the total sample 116 (85.3%) were with type 2 diabetes and 20 (14.7%) were with type 1 diabetes. Their age range was 19 to 62 years (41 ± 10.6) giving male to female ratio of 0.9:1. Blood samples were drawn with an overnight fasting (more than 12 hours) and before morning medication for lipid study. Total cholesterol, triglyceride (TG), high density lipoprotein (HDL), low density lipoprotein (LDL) and very low density lipoprotein (VLDL) were estimated. Student t test was used to estimate differences in lipoprotein between the studied groups.

RESULTS:

There were no significant differences in cholesterol, HDL, LDL, VLDL and TG between patients with type 1diabetic (175.9 ± 35.9, 55.4 ± 12.8, 99.2 ± 32.5, 32.2 ± 9.5 and 160.4 ± 37.7, respectively) and patients with type 2diabetes (181.4 ± 46.6, 54.1 ± 24.6, 103.5 ± 40.5, 29.9 ± 15.8 and 143.8 ± 72.8, respectively) (Table 1). Analysis of cholesterol, HDL, LDL, VLDL and TG in patients with type 1 diabetes by the duration of the disease revealed significantly higher levels among patients had the

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disease for ≥ 10 years than in patients had the disease for ≤ 10 years (t=4.4, d.f.=12, p < 0.05, t=5.9, d.f.=12, p < 0.05, t=4.01, d.f.=12, p < 0.05, t=2.49, d.f.=12, p < 0.05, and t=2.29, d.f.=12, p < 0.05). Besides only TG was significantly higher in patients with type 2diabetes had the disease for ≥ 10 years than in patients had the disease for ≤ 10 years (t=2.4, d.f.=76, p < 0.05 (Table 2).

DISCUSSION:

The finding that level of cholesterol and LDL were elevated while HDL level was low in patients with type 2 diabetes is in agreement with other reports [4,5,10]. This finding indicates that the studied patients were at high risk of coronary heart disease [11-15]. Lipid abnormal findings can largely be related to extent of obesity, dietary habits [16,17], genetic make up [18] of the population and lack of physical activity [19]. The revealed lipid profile in this study reflects the poor glycaemic control. Several studies stressed that glycaemic control in type 2diabetes improve diabetic related lipids [20-22]. Other workers suggested a multifactorial intervention in patients with type 2 diabetes [23-25]. There is a strong evidence that lifestyle intervention (cessation of smoking, regular exercise and diet) have a cardiovascular benefit [26-28]. The study revealed high levels of cholesterol, LDL, VLDL and TG among patients with type 1diabetes. This finding may indicate poorly controlled diabetes [29]. The highest lipoprotein values in patients with type 1diabetes associated with poorest metabolic control [30]. It is well known that changes in the lipoprotein composition in patients with type 1diabetes are dependent on the degree of glycaemic control [31,32]. The finding that levels of cholesterol, LDL and TG were significantly associated with duration of type 1diabetes and level of TG was significantly associated with duration of diabetes in type 2diabetes may be attributed to poor glycaemic control. It was found that good management of diabetes seems to be of paramount importance in controlling dyslipidemia [33]. Hyperglycaemia is closely related to hypercholestraemia , hyperglyceridemia and elevation in LDL [31]. It was found that diabetic patients with lack of diabetic control have higher lipids, low HDL, consquently they were at a high risk of developing coronary heart disease [31-34].

CONCLUSION:

Our study has documented lipid abnormal findings in diabetic patients in Al-Anbar governorate, with poor control of diabetes. Thus, lipid and diabetic awareness program for Iraqi population in general and diabetic patients are recommended in particular, in an attempt to improve the overall health status of Iraqi population.

Table 1: Lipoprotein profile among diabetic patients

	Diabetic patients	
Lipid	Type 1	Type 2
Cholesterol	175.9 ± 35.9	181.4 ± 46.6
HDL	55.4 ± 12.8	54.1 ± 24.6
LDL	99.2 ± 32.5	103.5 ± 40.5
VLDL	32.2 ± 9.5	29.9 ± 15.8
TG	160.4 ± 37.7	143.8 ± 72.8

Table 2: Lipid profile different diabetic patients according to duration

	Type 1 diabetes			Type 2 diabetes		
	Duration (Years)			Duration (Years)		
Lipid	≤ 5.9	6 -9.9	≥ 10	≤ 5.9	6 -9.9	≥ 10
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Cholesterol	171.6 [a] (15.7)	211 (16.2)	207 (11.5)	177.4 [f] (41.3)	196.8 (36.3)	179.4 (35.8)
HDL	54.1 [b] (5.8)	56.5 (12.3)	81 (14.2)	55.9 [g] (18.7)	51.2 (20.2)	53.6 (15.6)
LDL	90.2 [c] (28.6)	110 (28.7)	150 (22.9)	101.6 [h] (35.4)	106.8 (37.7)	100.9 (32.6)
VLDL	31.2 [d] (6.8)	33.7 (5.7)	40 (5.4)	29.6 [i] (13.5)	37 (17.2)	26.6 (14.5)
TG	159.3 [e] (25.6)	171 (28.7)	200 (20.5)	139.6 [j] (72.8)	183 (60.7)	179.4 (68.9)

	Type 1 diabetes				Type 2 diabetes		
	t	d.f	p		t	d.f	p
a	4.4	12	< 0.05	f	0.11	76	NS
b	5.9	12	< 0.05	g	0.57	76	NS
c	4.01	12	< 0.05	h	0.13	76	NS
d	2.49	12		i	0.94	76	NS
e	2.29	12		j	2.4	76	< 0.05

REFERENCES:

1. Winngard DL, Barrett – Conner E. Heart disease and diabetes. In: National diabetes data group. Diabetes in America. 2nd edition. Washington DC. Government printing office, 1995. 429 – 448.
2. Stamler J, Vaccaro O, Neaton JD, Wenworth D. diabetes in multiple risk factors and 12 years cardiovascular mortality for men screened in multiple risk factor intervention trial. Diabetes care 1993; 322: 1700 – 1707.
3. Haffner SM. Coronary heart disease in patients with diabetes. N Eng J Med 2000; 342: 1040 – 1042.
4. Haffner SM, Letho S, Ronnemaa T, et al. Mortality from coronary heart disease in subjects with type 2diabetes and in non diabetic subjects with and without prior myocardial infarction. N Eng J Med 1998; 339: 229 – 234.
5. Solomon CW. Reducing cardiovascular risk in type 2diabetes. N Eng J Med 2003; 348: 457 – 459.
6. Perkins BA, Bril V. Early vascular risk factor modification in type 1diabetes. N Eng J Med 2005; 352: 408 – 409.
7. Alwan A. Health in Iraq. A draft prepared as a discussion paper for the first National Conference on Health. Ministry of Health. 2004.
8. Al-Kasab F. Prevalence of diabetes in rural community in Iraq. Int J Epidemiol 1979; 8:
9. Al-Hamadani RY. Pattern of dyslipidaemia in diabetic patients. J Basic Med Sc 2002; 2: 107 – 110.
10. Simon LA, Friedlander Y, McCallum J, simon J. Risk factor for coronary heart disease in the prospective Dubbo study of Australian elderly. Atherosclerosis 1995; 117: 107 – 118.
11. Expert Panel on Detection, Evaluation and treatment of high blood cholesterol in Adults Summary of the second report of the National Cholestrol Education Program (NCEP). Expert Panel on Detection, Evaluation and Treatment of High Blood Cholestrol in Adults (Adult Treatment Panel 11). JAMA 1993; 209: 3015 – 3023.
12. American Diabetes Association. Management of dyslipidaemia in adults with diabetes. Diabetes Care 1997; 20: 469 – 471.
13. Burke JP, William K, Gaskill SP, et al. Rapid rise in the incidence of type 2diabetes from 1987 – 1990: results from San Antonio Heart Study. Arch Intern Med 1999; 159: 1450 – 1456.
14. Gu K, Cowie CC, Harris MI. Diabetes and decline in heart disease mortality in US adults. JAMA 1999; 281: 1291 – 1297.
15. American Diabetes Association. Management of dyslipidemia in adults with diabetes. Diabetes Care 2000; 23 (suppl): S 57 – S 60.
16. Quivers ES, Driscoll DJ, Garvey CD et al. The effect of diet on serum cholesterol in children. Ann N Y Acad Sci 1992; 623: 133 – 134.
17. Al-Shehri SA, Saleh ZA, Salama MM, Hassan YM. Prevalence of hyperlipidaemia among Saudi school children in Ryadh. Ann Saudi Med 2004; 24: 6 – 8.
18. Tenkate LP, Boman H, Diager SP, Motulsky AC. Familial genetic risk factors. Am J Cardiol 1982; 50: 942 – 953.
19. El-Hazmi MAF, Warsy AS. Obesity overweight and type 2diabetes mellitus in Saudi adults patients. Saudi Med J 1999; 20: 167 – 172.
20. Akbar DH, Al-Gamdi AA, Hejazi AA. Poor lipid control in type 2diabetics with and without ischaemic heart disease. Endocrine 2003; 21: 217 – 220.
21. Abdel-Gayoum AG. The effect of glycaemic control in type 2diabetic patients with diabetes – related dyslipidaemia. Saudi Med J 2004; 25: 207 – 211.
22. Gaede P, Vedel P, Larson N, et al. Multifactorial intervention and cardiovascular disease in patients with type 2diabetes. N Eng J Med 2003; 348: 383 – 393.
23. Solomon C. Reducing cardiovascular risk in type 2diabetes. N Eng J Med 2003; 348: 457 – 459.

24. Simon LA. Diabetes and coronary heart disease. N Eng J Med 1998; 339: 1714 – 1715.

25. Hu FB, Strncpler MJ, Solomom C et al. Physical activity and risk for cardiovascular event. Ann Intern Med 2001; 134: 96 – 105.

26. Hu FB, Willett WC. Optimal diet for prevention of coronary heart disease. JAMA 2002; 288: 2569 – 2578.

27. Heart protection Study Collaborative Group. MRC / BHF Heart Protection study of antioxidant vitamin supplementation in 20536 high risk individuals: a randomized placebo – controlled trial. Lancet 2002; 360: 23 – 33.

28. Nikkila EA, harmila P. Serum lipids and lipoproteins in insulin treated diabetics: demonstration of increased high density lipoprotein concentrations. Diabetes 1978; 107: 1078 – 1085.

29. Laakso M, Pyorala K, Sarlund H, Voutilainen E. Lipid and lipoprotein abnormalities associated with coronary heart disease in patients with insulin – dependent diabetes mellitus. Atherosclerosis 1986; 6: 679 – 684.

30. Johansen K. Hyperlipidaemia in diabetes mellitus: pathogenesis, diagnosis and pharmacological therapy. Ann Saudi Med 1990; 10: 194 – 201.

31. Martinez MT, Ramas O, Corretero N et al. Lipoprotein a and other risk factors in children with insulin – dependent diabetes mellitus and children without diabetes. Diabetes Metab 1994; 20: 522 – 525.

32. Nikklia EA. Are plasma lipoproteins responsible for excess atherosclerosis in diabetes? Acta Endocrinol (suppl) 1985; 110: 27 – 30.

33. Ladeia AM, Adan L, Couto-Solve AC et al. Lipid profile correlates with glycaemic control in young patients with type 1diabetes. Prev Cardiol 2006; 9:82-88.

34. Jarret RT. Is insulin atherogenic? Diabetologia 1988; 31: 71 – 75.

35. El-Hazmi MAF, Al-Swaitem AR, Warsy AS et al. Lipid and related parameters in Saudi type 2diabetes mellitus patients. Ann Saudi Med 1999; 19: 304 – 307.