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ORIGINAL ARTICLE

Association of Insulin and Lipoprotein Level in Subjects of T2dm and Non Diabetics

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ABSTRACT

Aim: To compare and correlate the serum insulin and lipoprotein levels in diabetics and non-diabetics.
Methods: A cross-sectional study with total of 88 subjects. These were divided into three groups i.e. A, B, C. Group A constitutes 34 cases of newly diagnosed T2DM and group B includes 34 cases on oral hypoglycemic treatment. Group C includes 20 subjects as controls which were age and sex matched. Blood glucose level, HDL-c and LDL-c were done in the lab. By usual methods and insulin level was done by ELISA methods.
Results: In diabetic groups i.e. A and B, mean insulin levels were significantly lower and glucose and LDL-c levels were significantly higher than control group i.e. group C. HDL-c level was similar in diabetic groups (A and B) and control group (group C). There was found no correlation between insulin and lipoproteins in this study.
Conclusions: Insulin level was higher in control group as compared to study subjects and this difference was not statistically significant. LDL-c level was higher in diabetic group i.e. A and B as compared to control group (C) and this difference was statistically significant. Association between insulin and lipoproteins is non significant statistically.
Keywords: Insulin, Lipoprotein, Type-2 diabetes

INTRODUCTION

Adiponectin is a pro inflammatory protein. This protein explains the association of obesity with insulin resistance[1]. It also explains the correlation of obesity and T2DM and atherosclerotic disease [2-4]. The association of inflammation with these diseases is not to be a simple one. In previous study, association of a pro inflammatory state with diabetes varies by ethnic group and smoking[5].

A secretory protein called adiponectin, has important metabolic and anti-inflammatory action. This protein has a protective role in the development of diabetes[6,7]. An epidemiologic study favors this argument, because they correlate a lower incidence of diabetes for those with higher adiponectin levels. But this association is not been reported yet in African Americans[8].

The objective of the study was to compare and correlate the serum insulin and lipoprotein levels in diabetics and non-diabetics.

METHODOLOGY

After approval from Hospital Ethical Committee, this cross sectional study was conducted in Medical Department, Lahore General Hospital, Lahore and Department of pathology, PGMI, Lahore for a period of 7 years from February, 2012 to August, 2012. Sample selection was random sampling. Sampling technique used was non probability technique.
Inclusion Criteria: Non- obese patients having T2DM; both males and females were included with age from 30 to 50 years.
Exclusion Criteria: T1DM subjects and subjects with H/o endocrine ailments, renal or hepatic disease, cerebrovascular diseases and hypertension.
Groupings:
Group A: 34 newly diagnosed patients without any treatment.
Group B: 34 patients on oral hypoglycemic treatment.
Group C: 20 age and sex matched non diabetic controls.
Sample collection: An informed consent was taken. Five ml of venous blood was taken in gel vial. The data was collected and entered and analyzed by SPSS version 15. Mean±SD values are given for normally distributed quantitative variables. Comparison was done between the two groups. Person s correlation was applied to see correlation between groups. p value <0.05 was considered statistically significant.

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RESULTS

Table 1: Age comparison in different groups

	Groups		
	Group A	**Group B**	**Group C**
Mean± SD	45.9 ±5.78	45.6 ±5.9	39.2 ± 7.8
Ranges	30—50	30—50	30—50
Total	34	34	20

Table 2: Serum insulin level in groups

Group	**Insulin level Mean± SD**	**P vale**	
A	8..93 ±8.4	A vs B	0.347 (NS)
B	11.23 ± 11.34		
C	17.85 ±24.89	A vs C B vs C	0.136 (NS) 0.273 (NS)

Table 3: HDL-c Level in groups

HDL-c	**Groups**		
	Group A (n=34)	**Group B (n=34)**	**Group C (n=20)**
Mean± SD	54.85± 13.76	54.02 ±23.39	53.65± 9.83
Ranges	27—83	33—168	41–76
Total	34	34	20

A vs B= 0.860 (NS), A vs C= 0.711 (NS), B vs C= 0.945 (NS)

Table 4: LDL-c Level in groups

LDL-c	**Groups**		
	Group A (n=34)	**Group B (n=34)**	**Group C (n=20)**
Mean±SD	111.2 ± 38.49	109.38 ± 54.38	88.55± 19.93
Ranges	67—221	41—246	45—132
Total	34	34	20

A vs B= 0. 874 (NS), A vs C= 0. 006 (S)
B vs C= 0. 050 (S)

DISCUSSION

Regarding insulin levels in this study, the comparison between group A diabetic and group B on oral hypoglycemic drugs showed insignificant outcome and p value (A and B) = 0.347, P value (A and C) = 0.136 and P value (B and C) = 0.273 (NS). Tsou et al (2004)[9] have showed similar consequences in their study. Another study was done by Hanley et al (2007)[11] in subjects with serum insulin level and ages between 26 to 56 years.

Regarding HDL-c levels in our study, the evaluation between group A (newly diabetic) and group B (subjects on oral hypoglycemic drugs) showed insignificant consequences i.e. p value (A and B) = 0.860 (NS).

Regarding LDL-c levels in this study, the assessment between group A (newly diabetics without treatment) and group B (subjects on oral hypoglycemic medicine) observed in significant consequences i.e. p value (A and B) = 0.874 (NS). The relationship between group A i.e., newly diabetic subjects and group C i.e. non diabetic subjects observed significant outcome i.e. p value for groups A and C = 0.006 (Significant). The assessment between group B (diabetics with oral hypoglycemic medicine) and group C (non diabetic subjects) also observed significant outcome i.e. p value of groups B and C is p = 0.050 (Significant).

Regarding relationship in this study, association between Insulin and HDL-c level in group A i.e. newly diabetics without any treatment was insignificant statistically with p = 0.601(NS) and r value was 0.093 which is insignificant statistically.

Regarding relationship between insulin and LDL-c levels, group A showed insignificant consequences statistically (p value=0.117) and r value showed insignificant negative relationship statistically (r = -0.027). Regarding relationship between insulin and LDL-c levels in group B i.e. diabetics with drugs was insignificant and p value was 0.135 while r value was 0.262 which showed insignificant negative relationship.

Brehm A et al (2004)[10] observed that there was positive relationship among triglyceride levels and resistance of insulin. This study also showed that there is no change in cholesterol level and LDL-c level in insulin-resistant conditions.

Tangvarasittichai S et al (2010)[12] showed in their study raised Triglyceride, decreased HDL-c with elevated LDL-c levels and with increase of insulin. This difference may be due to racial difference of their studies.

CONCLUSIONS

Insulin levels were higher in control group as compared to other groups. LDL-c levels were higher in diabetic group as compared to control group and this difference was statistically significant. Association between insulin and lipoproteins is insignificant statistically.

Conflict of interest: Nil

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