

Serum Adiponectin and Insulin Levels in Asymptomatic Offspring's of patients with Type 2 Diabetes

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ABSTRACT

Aim: To measure and compare the Adiponectin and Insulin levels of asymptomatic offspring of type 2 diabetic patients with asymptomatic offspring of non-diabetics.

Study design: Case control study.

Setting: Pathology Department PGMI, Lahore and Diagnostic Laboratory of UVAS, Lahore.

Period: Nine months.

Methodology: Healthy non diabetic offspring of diagnosed patients with type 2 diabetes mellitus attending the medical departments of LGH Lahore, both male and female below 30 years of age, documented by normal fasting blood glucose level and not having any symptom of diabetes were included.

Results: In this study, Adiponectin and insulin were measured by ELISA technique in 100 subjects. Mean \pm SD of adiponectin in control group was 5.20 \pm 2.23 and in study group was 4.38 \pm 1.38 having non-significant difference having P value 0.14. Mean \pm SD of insulin in control group was 16.80 \pm 4.09 and in study group was 18.40 \pm 13.32 having non-significant difference having P value 0.098.

Conclusions: Insulin levels were significantly lower in control group as compared to asymptomatic offspring of patients having T2DM. The adiponectin levels were slightly lower in asymptomatic offspring of patients having T2DM as compared to the control group; these slight differences were not statistically significant. There was slight negative correlation between serum adiponectin levels and insulin levels which was statistically not significant.

Keywords: Adiponectin, ELISA, Type 2 diabetes mellitus (T2DM), Insulin

INTRODUCTION

Recently the prevalence of T2DM has risen. Disease involves two defects in pre-diabetic state: peripheral insulin resistance and blood insulin level is increased and there is failure of insulin secretion to compensate for the insulin resistance.¹ Combination of environmental and genetic factors result in molecular defect in insulin resistance and secretion².

Adiponectin is a peptide oligomer of 30 kDa sub units. Principal actions of adiponectin are suppression of glucose formation and increase of fatty acid oxidation in liver and muscle. Adiponectin is secreted from adipose tissues into the bloodstream, where its level accounts for approximately 5-10 μ g/ml.³ Adiponectin was first demonstrated in mice in pre-adipocytes which differentiated into adipocytes^{4,5} The most suitable marker is the circulating

adiponectin that can be detected in the serum, before the onset of hyperglycemia or T2DM⁶. Plasma concentrations of adiponectin are reduced with increased insulin resistance and T2DM, therefore suggesting protective effects with high concentrations.⁷ Adiponectin concentrations are inversely associated with insulin concentrations^{8,9}.

METHODOLOGY

It was a case control study performed in PGMI, Lahore and University of Veterinary and animal sciences, Lahore. A total of 100 subjects were included with 64 males and 36 females and were divided into groups A & B. Group A having age and sex matched 50 non-diabetic healthy subjects as controls, being offspring of parents with no history of T2DM. Group B included 50 non-diabetic healthy subjects, consisting of 33 males and 17 females below 30 years of age, being offspring of patients having T2DM. 5 ml blood was taken aseptically. Collected data was analysed by SPSS version 15.

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RESULTS

The detail of results is given in tables 1 and 2

Table 1: Plasma Insulin in Group A and B

Insulin (μ U/ml)	Group A	Group B
Mean \pm SD	16.8 \pm 4.1	18.4 \pm 13.3
Males	17.6 \pm 3.3	18.1 \pm 4.1
Females	26.3 \pm 6.4	20.1 \pm 9.3

A Vs B $P > 0.05$ (non-significant)

Group A= Offspring of non-diabetic subjects.

Group B= Offspring of patients with T2DM

Table 2: Serum Adiponectin in Group A and B

Adiponectin(μ g/ml)	Group A	Group B
Mean \pm SD	5.2 \pm 2.2	4.4 \pm 1.4
Males	5.6 \pm 2.5	4.5 \pm 1.4
Females	4.5 \pm 1.4	4.4 \pm 1.5

A Vs. B $P > 0.05$ (non-significant)

DISCUSSION

Fasting insulin in male study subjects and male controls was non significant ($p > 0.05$) statistically. Similarly fasting insulin level in female study subjects and female controls was also non significant ($p > 0.05$) statistically. This study is consistent with the study of Tsou et al who also observed similar results in their study¹⁰. Our study was also in accordance with the study of Anthony et al but they have subjects of ages 26 to 56 years¹¹.

Serum adiponectin in groups A&B showed non-significant difference ($p > 0.05$). Comparison between fasting adiponectin in male study subjects and male controls was non significant statistically. Similarly fasting adiponectin in female study subjects and in the female controls was also non significant ($p > 0.05$) statistically. Adiponectin distribution in group A i.e. 44 (88%) were between adiponectin 2.27-7.75 μ g/ml and 6 (12%) were between adiponectin 7.76-12.52 μ g/ml. Adiponectin distribution in group B i.e. 30(60%) subjects were having adiponectin level between 1.69-4.80 μ g/ml while 20(40%) subjects were having adiponectin level between 4.81-6.77 μ g/ml respectively. This study is in favor of Yokoyama et al, who showed adiponectin level with non significant difference statistically¹². This study was also in favor

of study with Tschritter et al, who showed non significant difference. In contrast, adiponectin levels were not significantly different between subjects with and without family history of type 2 diabetes mellitus. Adiponectin concentration was significantly higher in women than in men ($P < 0.01$)¹³.

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