Study of Insulin Resistance in Relation to Serum IGF-I Levels in Treated Type-II Diabetic Patients

Sir,

Insulin resistance is a chronic metabolic syndrome characterized by a cluster of abnormalities including altered glucose tolerance, visceral adiposity, hypertension, low HDL cholesterol and high triglyceride levels, is linked with so many cardiovascular diseases. There is an increasing evidence has suggested that in the last few years, IGF-I may have a role in both glucose homeostasis and atherosclerotic cardiovascular disease. In this study we have evaluated the correlations between IGF-I concentrations in fasting serum samples using anthropometric and biochemical variables in patients with type-II diabetes treated with different oral hypoglycemic drugs.

The study included 6 nondiabetic subjects, 10 type-II diabetic patients treated with different oral hypoglycemic drugs (metformin and glybenelamide) were selected at the Department of General Medicine, Mahatma Gandhi Memorial Hospital, Warangal, Andhra Pradesh, India from March 2006 to June 2007. The inclusion criteria of type-II diabetic patients as per the American Diabetes Association based on fasting (> 126 mg/dl) or post lunch blood glucose levels (> 200mg/dl). Fasting blood glucose, lipid profile, insulin, c-peptide, high sensitive C - reactive protein (Hs-CRP), HbA,c and IGF-I concentrations were determined. Insulin resistance and sensitivity were assessed by using the previously validated homeostasis model assessment. Group differences of continuous variables were compared using unpaired student’s t-test. Relationships between variables were determined by Pearson’s correlation coefficient. For all analyses, a P value < 0.05 was considered to be statistically significant.

Treated type-II diabetes patients who were on maximum OHA had significantly higher fasting and post lunch blood glucose (312.8 ± 94.2) (427.8 ± 75.8) (P<0.0001, P<0.0001), glycosylated hemoglobin (10.1 ± 3.4) (P=0.010) and high sensitive c-reactive protein (6.6 ± 3.5) (P=0.005) and not significantly higher fasting serum insulin (8.7 ± 8.9), c-peptide (1.2 ± 0.7), abnormal lipid profile like triglycerides and total cholesterol (122.1 ± 38.3, 178.9 ± 34.6) and insulin resistance (6.7 ± 7) (HOMA-IR) levels than nondiabetic subjects (87.2 ± 7.1, 111.5 ± 11.2, 5.9 ± 0.5, 1.5 ± 1.4, 6 ± 4.8, 124.5 ± 35.2, 173.7 ± 33.6, 1.33 ± 1.06) respectively. Insulin sensitivity expressed as HOMA-S, was not significantly lower (0.3 ± 0.2) in treated patients when compared to the normal subjects (3.38 ± 4.37) (P=0.050). Interestingly, fasting serum IGF-I concentrations were significantly lower (122.9 ± 49.2) in treated type-II diabetes patients when compared to the normal subjects (178.8 ± 44.5) (P=0.043).

Univariate correlations between serum IGF-I concentrations and established components of the insulin resistance syndrome were in treated type-II diabetic patients serum IGF-I concentrations were negatively correlated with age (-0.669) (P=0.048), BMI (-0.739), fasting and post lunch glucose (-0.355, -0.558), HbaA1c (-0.014), Hs-CRP (-0.021), insulin (-0.408), c-peptide (-0.287), total lipid profile (-0.500, -0.892) and insulin resistance (-0.486) expressed as HOMA-IR but positively correlated with HDL cholesterol (0.644) and insulin sensitivity expressed as HOMA-S (0.779) (P=0.013).

The present study indicates that serum IGF-I concentrations particularly low levels may be a useful marker for identifying diabetic patients at risk of developing possible cardiovascular complications as they are also showing significant increased levels of HbA,c and Hs-CRP. Especially, the insignificant correlations in treated patients when compared to normal subjects were may be because of sample size. Further prospective and clinical intervention studies in large number of subjects / patients are required to definitively prove this hypothesis.

M Srinivas*, P Narayana**, T Surender**, DR Krishna*
*Department of Pharmacology and Clinical Pharmacy, University College of Pharmaceutical Sciences, Kakatiya University, Warangal – 506 009, Andhra Pradesh. **Department of General Medicine, Mahatma Gandhi Memorial Hospital, Warangal – 506 002, Andhra Pradesh.

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REFERENCES