Insulin Resistance in Type 2 Diabetes Mellitus: Prospect of an Untouched Area

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Background

HOMA estimated insulin resistance is an independent predictor of cardiovascular disease in type-2 diabetic subjects. Lack of exact cutoff value in Indians and the absence of local reference data from Gwalior region of central India for HOMA-IR create a challenging issue for early detection of complications and selecting the treatment option.

Aims & Objectives

To define a local reference cutoff and its association with various risk variables.

Material & Methods

We randomly selected 50 cases and 50 controls, matched for age and sex, from the teaching hospital of G.R. Medical College Gwalior, India.

Results

Mean HOMA IR for cases was 4.16 ± 3.57 (range 0.22-18.71) while for control subjects was 2.03 ± 0.64 (range 1.08- 4.4). The normal cutoff value was found to be 3.31. A significantly high proportion of the cases (22, 44%; $p<0.0001$) were above the normal cutoff of 3.31 as compared to controls (2, 4%). HOMA- IR was found to be significantly associated with BMI ($r=0.41$; $p=0.002$), WHR ($R=0.34$; $P=0.01$) and FPI ($r=0.90$; $p<0.001$). Mean of HOMA-IR was significantly higher in subjects with generalized obesity (without generalized Obesity: cases 3.04 ± 1.99, control 2.03 ± 0.64; $p<0.0001$ vs. with generalized obesity: cases 7.7 ± 5.03, control 0) and abdominal obesity (without abdominal obesity: cases 2.85 ± 1.5, control 2.03 ± 0.7; $p=0.01$ vs. with abdominal obesity cases 5.69 ± 4.56, controls 2.05 ± 0.56; $p=0.001$). Female preponderance for the metabolic syndrome was reported in both cases (female 15, 100%; males 33, 94.28%; $p>.9$) and control (female 14, 93.33%; males 54, 54.28% $p=0.002$). Mean of the HOMA-IR was significantly higher in cases with complications like retinopathy (9.3 ± 5.12, $p<0.01$), nephropathy (7.18 ± 3.29, $p<0.01$), neuropathy (5.64 ± 2.1, $p<0.01$), CAD (5.76 ± 0.8, $p<0.05$) and risk of PVD (5.68 ± 0.1, $P<0.0001$) as compared to cases without complications.

Conclusions

We concluded that the cutoff of HOMA-IR was higher in the studied population as compared to reports in other Indian studies, with female preponderance for the metabolic syndrome. Dietary and life style modification could have a positive impact on decreasing the toll of complications in these patients as non obese have less insulin resistance, which is significantly associated with complications in the studied population.