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Insulin Indices and Metabolic Characteristics of Young Adults with Prediabetes: An Emerging Threat

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Abstract

Background: Prediabetes is often overlooked in young adults, although early insulin resistance and metabolic abnormalities can accelerate the onset of type 2 diabetes. Ethnic and environmental differences necessitate population-specific data to guide preventive strategies.

Aims: To compare insulin indices, anthropometric markers, and metabolic profiles between young adults with prediabetes and normoglycemia.

Method: This cross-sectional study included 58 participants with prediabetes and 143 with normoglycemia, aged 18-34 years, recruited from the Young Diabetes Clinic at Bangladesh Medical University (September 2023-February 2024). Prediabetes was defined by the ADA OGTT criteria. Anthropometric measurements, lipid profiles, fasting insulin, C-peptide, and insulin indices (HOMA-IR, HOMA-β) were assessed. Statistical comparisons were made between prediabetic and normoglycemic groups.

Results: Prediabetes was associated with older age, male sex, and smoking ($p<0.05$ for all). Obesity was more prevalent in prediabetes, with higher mean BMI (25.9 vs. 23.3 kg/m²), central obesity (72.4% vs. 52.4%), and abnormal waist-height ratio (91.4% vs. 77.6%) in comparison to normoglycemic ($p<0.05$ for all). Prediabetic participants had higher mean systolic (112 vs. 106 mm Hg) and diastolic (78 vs. 74 mm Hg) blood pressure, increased triglycerides (168 vs. 111 mg/dL), and elevated TG/HDL ratio (4.1 vs. 2.6) ($p<0.05$ for all). Fasting insulin (18.3 vs. 10.3 µIU/mL) and C-peptide (3.6 vs. 2.3 ng/mL) were significantly higher, with increased HOMA-IR (3.4 vs. 2.1) ($p<0.05$ for all). However, although reduced in prediabetes, HOMA-β (117 vs. 140) was not significantly different between the two groups.

Conclusion: Young Bangladeshi adults with prediabetes demonstrate early-onset obesity, dyslipidemia, hypertension, and insulin resistance, underscoring a trajectory toward type 2 diabetes. Early identification and lifestyle interventions are critical to mitigate this emerging threat. *[J Assoc Clin Endocrinol Diabetol Bangladesh, 2025;4(Suppl 1): S50]*

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