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Association of Indian Diabetes Risk Score with Arterial Stiffness in Asian Indian Nondiabetic Subjects: The Chennai Urban Rural Epidemiology Study (CURES-84)

Viswanathan Mohan, M.D., Ph.D., D.Sc., FRCP, FNASc, Kuppan Gokulakrishnan, M.Sc., Ph.D., Anbazhagan Ganesan, B.Sc., and Srivastava Brijendra Kumar, M.B.B.S., F.Diab.

Abstract

Objective:

In this study, we aim to determine the association of Indian Diabetes Risk Score (IDRS) with augmentation index (AI), a preclinical marker of early atherosclerotic changes.

Methods:

Subjects without known diabetes (n = 1985) were randomly selected from the Chennai Urban Rural Epidemiology Study, an ongoing population-based study on a representative population (aged ≥20 years) of Chennai, the largest city in Southern India. Augmentation index was measured using the Sphygmocor apparatus (Sphygmocor BPAS-1; PWV Medical, Sydney, Australia). Serum lipids were measured in an overnight fasting sample along with other biochemical parameters. Indian Diabetes Risk Score includes four parameters: age, abdominal obesity, family history of type 2 diabetes, and physical activity.

Results:

Arterial stiffness values increased with an increase in IDRS. Subjects with IDRS ≥60 had significantly higher AI (24.6 ± 7.2; $p < .001$) compared to subjects with an IDRS of 30–60 (16.4 ± 5.5; $p < .001$) and with IDRS <30 (13.3 ± 4.5), and the p for trend was statistically significant (<.001). Pearson correlation analysis in the total population revealed that AI was significantly correlated with age ($p < .001$), systolic and diastolic blood pressure ($p < .001$), IDRS ($p < .001$), glycated hemoglobin A1c (A1C) ($p < .001$), serum cholesterol ($p < .001$), serum triglycerides ($p < .001$), high-density lipoprotein (HDL) cholesterol ($p < .001$), low-density lipoprotein cholesterol ($p < .001$), and non-HDL cholesterol ($p < .001$). In linear regression analysis, IDRS showed a significant association with AI even after adjusting for blood pressure, smoking, insulin resistance, A1C, cholesterol, and triglycerides ($\beta = 6.388$; $p < .001$).

Conclusion:

This study shows that, in addition to identifying unknown diabetes, IDRS also helps to identify those with arterial stiffness.

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Author Affiliation: Madras Diabetes Research Foundation, Dr. Mohan's Diabetes Specialities Centre, WHO Collaborating Centre for Non-Communicable Diseases Prevention and Control, Chennai, India

Abbreviations: (A1C) glycated hemoglobin A1c, (AI) augmentation index, (BMI) body mass index, (CAD) cardiovascular disease, (CURES) Chennai Urban Rural Epidemiology Study, (HDL) high-density lipoprotein, (HOMAIR) homeostasis assessment model for insulin resistance, (IDRS) Indian Diabetes Risk Score, (LDL) low-density lipoprotein, (ROC) receiver operating characteristic, (WHO) World Health Organization

Keywords: arterial stiffness, Asian Indians, atherosclerosis, augmentation index, Indian Diabetes Risk Score

Corresponding Author: Viswanathan Mohan, M.D., Ph.D., D.Sc., FRCP, FNASc, Madras Diabetes Research Foundation, Dr. Mohan's Diabetes Specialities Centre, 4, Conran Smith Road, Gopalapuram, Chennai 600 086, India; email address drmohans@vsnl.net