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Development of a Metabolic Syndrome Severity Score and its Association with Incident Diabetes in an Asian Population – Results from a Large Longitudinal Cohort in Singapore

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Objective(s): Hitherto, there is no metabolic syndrome severity score for Asians. We aim to develop a metabolic syndrome severity score and assess its association with incident diabetes in Singapore.
Materials and Methods: In a longitudinal study, 4109 subjects without baseline diabetes participated in a community screening programme in 2013-2016. Metabolic Syndrome (MetS) was defined according to Adult Treatment Panel III (ATPS-III MetS). A MetS severity z-score was derived from standardised loading coefficients of a confirmatory factor analysis for waist circumference, triglycerides, HDL-cholesterol, blood pressure and fasting glucose. Cox proportional-hazard model was used to assess risk of diabetes by the score and change in score for first and second screens, adjusting for MetS components, age, gender and race.
Results: There was high area-under-the-curve concordance between MetS severity score and ATP-III MetS(AUC=0.91;95%CI 0.90-0.92). The association between ATP-III MetS and incident diabetes was attenuated from HR 3.47 (95%CI 2.37-5.08;p<0.001) to 0.61 (0.30-1.22;p=0.165) in adjusted model, whereas baseline MetS severity score remained significantly associated with incident diabetes in adjusted model with HR 1.48 (1.04-2.11; p=0.031). The AUC for MetS severity score alone as a predictor of diabetes is significantly higher than that for ATP-III MetS alone (0.67 versus 0.61; p=0.004). The change in severity score was significantly associated with incident diabetes, with HR 2.09 (1.43-3.07; p<0.001), independent of baseline severity score.
Conclusion: The MetS severity score provided further prediction for incident diabetes in addition to individual MetS components. Changes in score conferred further association, thus highlighting the need to monitor MetS severity over time.