Impact of longitudinal changes in metabolic syndrome status over two years on 10-year incident type 2 diabetes mellitus

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Background: Metabolic syndrome (MetS) is a known predictor of diabetes mellitus (DM), but whether longitudinal changes in MetS status modify the risk for incident DM remains unclear. We investigated whether temporal changes in MetS status over two years modify the 10-year risk of incident DM.

Methods: A prospective cohort study was conducted in 7,317 adults aged 40-70 years without DM at baseline. Subjects were categorized into four groups based on repeated longitudinal assessment of MetS status over two years, as defined by the Adult Treatment Panel III guidelines: non-MetS, resolved MetS, incident MetS, and persistent MetS. The hazard ratio (HR) of new-onset DM during 10 years was calculated in each group using Cox models.

Results: During the 10-year follow-up, 1,099 (15.0\%) developed DM. Compared to the non-MetS group, the fully adjusted hazard ratios (95\% confidence interval) for new-onset DM were 1.27 (1.01-1.61) in the resolved MetS group, 1.78 (1.43-2.22) in the incident MetS group, and 1.85 (1.52-2.26) in the persistent MetS group (P for trend < 0.001). The 10-year risk of DM in subjects with resolved MetS was attenuated compared to those with persistent MetS over two years (P < 0.001). In addition, the adjusted hazard ratio for 10-year incident DM gradually increased according to the number of MetS components two years later.

Conclusions: Temporal changes in MetS status over two years influenced the 10-year risk of incident DM. Our findings suggest determining the status of MetS regularly and strictly controlling MetS are important in preventing DM.