Association of Parental History of Diabetes Mellitus with the Offspring’s Incidence is Modified by Offspring’s Body Weight, Findings from a Japanese Worksite-Based Cohort.

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INTRODUCTION: Parental history of diabetes mellitus (DM) is a well-known established risk factor for offspring’s DM incidence. However, there is an indication that the association may be modified by body weight of the offspring.

METHODS: Subjects were 4446 Japanese workers (3492 men and 954 women) without a history of diabetes at baseline. Parental history of DM was self-reported separately for father and mother. Type 2 DM (T2DM) incidence was ascertained from 2002 through 2011 by annual health check-ups and self-reports. Cox proportional hazard model adjusted for sex, smoking (current, never, past), frequency of ethanol consumption (times/week), body mass index (BMI, kg/m²), physical activity (yes/no) was used to estimate hazard ratios (HRs) and the 95% confidence intervals (95% CIs) of the parental history groups. Stratified analyses by sex and overweight (BMI $\geq 25$ kg/m²) were performed, and the interaction was tested by likelihood ratio tests.

RESULTS: During the follow-up, 277 cases (227 men, 50 women) of T2DM (incidence rate: 7.94 per 1000 person-year) were observed. The HRs (95% CIs) of diabetes history in father, mother, and both parents compared to neither were 1.73 (1.21–2.48), 1.72 (1.11–2.67), and 3.12 (1.28–7.58), respectively. Stratified analysis by overweight revealed that there was an increased risk of T2DM associated with maternal history in normal weight subjects (incidence rate: 5.2 vs 13.2 per 1000 person-year; HR: 2.57, 95% CI 1.61–4.12), not in overweight subjects (incidence rate: 14.2 vs 12.8 per 1000 person-year; HR: 0.86, 95% CI 0.40–1.86, $P$ for multiplicative interaction = 0.014). The same pattern was not observed for paternal history of DM and overweight.

CONCLUSIONS: Maternal history of DM increased offspring’s risk of T2DM in normal weight subjects to a degree that was observed in overweight subjects in middle-aged male and female workers in Japan.