Peri-conceptional diet patterns and risk of gestational diabetes mellitus in South Indian women

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Gestational diabetes mellitus (GDM) affects 20% of pregnancies in India(1). In Western countries healthy diet patterns characterised by wholegrains, fruits and vegetables are associated with a lower GDM risk; and unhealthy patterns (refined grains, fried and fast food, high sugar, red and processed meat) with higher risk. Evidence from low- and middle-income countries is sparse, and diet pattern-GDM associations in India have not been explored. We aimed to identify peri-conceptional diet patterns among women in Bangalore and examine their associations with GDM risk.

BANGLES (BAngalore Nutrition Gestational diabetes Liifestyle Study) started in 2016, a prospective observational study in which pregnant women (n = 785) of varied socio-economic status were recruited at 5–16 weeks' gestation. Peri-conceptional diet was assessed retrospectively at recruitment, using a validated 224-item Food Frequency Questionnaire (FFQ). The 224 FFQ foods were reduced to 68 food-groups as input variables for principal component analysis to identify diet patterns. GDM was defined by a 75-gm Oral Glucose Tolerance Test (OGTT) at 24–28 weeks' gestation, applying WHO 2013 criteria. Diet pattern-GDM associations were analysed using multivariate logistic regression adjusting for ‘a priori’ confounders.

GDM prevalence was 22%. Three standardised distinct peri-conceptional diet patterns were identified: a) High-diversity, urban (HDU), characterised by consumption of a diversity of expensive, home-cooked, processed, healthy and unhealthy foods including wholegrains, fruits, vegetables, dairy, nuts, seeds, egg, poultry, meat, fast-food and sweets was associated with older, affluent, more educated and urban women; b) Rice-fried snacks-chicken-sweets (RFCS) pattern, characterised by low diet-diversity, was associated with younger, thinner, less educated women from lower-income, rural, joint families; c) Healthy, traditional vegetarian (HTV) pattern, characterised by home-cooked, vegetarian and non-processed foods was associated with women being thinner, less educated, affluent from rural and joint families. The HDU pattern was associated with a lower GDM risk (aOR: 0.80 per SD, 95% CI: 0.64, 0.99, p = 0.04) after adjusting for confounders, not significant after correction for multiple testing. Women’s BMI was the strongest risk factor for GDM and possibly partly mediated diet-GDM associations.

The findings support global recommendations to encourage women to attain a healthy pre-pregnancy BMI. The HDU pattern-lower GDM association, although not significant, was consistent with national and global diet recommendations to increase diet diversity(2,3,4). However, the HDU and RFCS patterns consisting of healthy and unhealthy foods may indicate low awareness and the need to invest in public education about healthy/unhealthy foods. Higher socio-economic status was positively associated with diet diversity (HDU & HTV). This highlights the need for national policies to make wholegrains, fruits, vegetables, dairy and poultry foods more affordable(3). In the future, the construction of a healthy diet index may be useful.

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References