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Pregnancy outcomes in women with class III obesity according to gestational diabetes status

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Introduction: Previous studies have shown that the combination of obesity and untreated gestational diabetes mellitus (GDM) has a higher risk of adverse pregnancy outcomes compared with obesity alone. It is not known if obesity in combination with treated GDM also has an increased risk.

Objectives: To compare the maternal and neonatal outcomes of women with class III obesity (body mass index $\geq$ 40 kg/m^2), with and without GDM (treated with diet or insulin).

Methods: A retrospective cohort study of 307 class III obese women who had singleton deliveries at The Canberra Hospital between mid-2011 and mid-2014. Women with pre-existing diabetes were excluded. Maternal demographic and clinical data, including GDM diagnosis and treatment, and maternal and neonatal outcomes were obtained from the Birthing Outcomes System, clinic attendance records and patient medical records. Occurrence rates of large-for-gestational-age (LGA) neonates, preterm delivery, primary caesarean section and pregnancy-related hypertension were compared between groups according to GDM status using logistic regression.

Results: 240 women (78.2%) did not have diabetes, 28 (9.1%) had diet-treated GDM and 39 (12.7%) had insulin-treated GDM. LGA was observed in 42 (17.5%) women with no diabetes, 3 (10.7%) with diet-treated GDM and 13 (33.3%) with insulin-treated GDM. Relative to women with no diabetes and diet-treated GDM, the odds ratio for a LGA neonate for women with insulin-treated GDM was 2.3 (1.06—4.92) after adjustment for maternal age, BMI, parity, smoking during pregnancy and chronic hypertension ($p = 0.04$). Differences in rates of preterm delivery, primary caesarean section and pregnancy-related hypertension according to diabetes status were not seen.

Conclusion: In class III obese women, insulin-treated GDM compared to diet-treated GDM and no diabetes was associated with a higher rate of LGA neonates. Diet only or insulin-treated GDM were not associated with a greater risk of other adverse maternal or neonatal outcomes.

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Correlates of growth trajectories in early childhood: Results from two cohorts of Australian children

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Background: Knowledge of growth trajectories and their determinants early in life have particular implications for designing future interventions to promote healthy growth. This study aimed to identify the modifiable child and maternal correlates of longitudinal growth trajectories from birth to age 42 months.

Methods: Secondary analyses of pooled data from the Melbourne Infant Feeding Activity and Nutrition Trial (InFANT) Program ($n = 540$) and the InFANT Extend study ($n = 514$) were conducted. Children's height and weight were collected at birth, 3, 9, 18, and 42 months. Age- and gender-specific height, weight, and body mass index-for-age z-scores (HAZ, WAZ, and BAZ) were computed using World Health Organisation growth charts. Mixed effect modelling was performed to examine whether growth trajectories (changes in HAZ, WAZ and BAZ) from birth to age 42 months were influenced by birth weight, rapid weight gain (defined as an increase from birth to 9 months in WAZ $\geq$0.67) and maternal factors.

Results: Low birth weight infants had significantly lower HAZ, WAZ and BAZ than normal weight

infants from birth to 42 months ($P < 0.001$). Infants with rapid weight gain had significantly higher BAZ and WAZ, but not HAZ, when compared to those without rapid weight gain ($P < 0.01$). Infants whose mothers were Australian born had higher HAZ than infants whose mothers were born overseas ($P = 0.02$). Increased pre-pregnancy BMI was a significant predictor of changes in all three growth parameters ($P < 0.01$). High maternal education was inversely associated with changes in WAZ and BAZ ($P < 0.01$).

Conclusion: Our findings indicate that low birth weight, rapid weight gain, and several maternal factors are potential correlates of growth trajectories early in life. Recognising these early determinants provides the focus for the design of future intervention strategies to target most-at-risk groups for promoting healthy growth.

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Simulating the effects of replacing sugar-sweetened beverages with beverage alternatives on obesity outcomes among Australian adults: A modelling study

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Background: Emerging studies indicate that replacing sugar-sweetened beverages (SSB) with beverage alternatives may be a feasible way of reducing SSB consumption and combating obesity prevalence. However, evidence as to the impact of beverage substitution on obesity is limited. This study aimed to investigate the associations between SSB consumption, its substitution with beverage alternatives, and obesity outcomes among the Australian population.

Methods: Data from adults participating in the 2011—12 National Nutrition and Physical Activity Survey (NNPAS) were used. Multivariate linear regression with adjustment for covariates was used to examine the associations between SSB consumption and body mass index (BMI) and waist circumference (WC), and substitution modelling was used to contemplate the effects of replacing SSB with water, coffee/tea, diet drinks, fruit juice, and milk on obesity outcomes.

Results: SSB intake (100 g/day) was associated with higher BMI ($\beta = 0.07$ kg/m^2, $P < 0.001$) and WC ($\beta = 0.25$ cm, $P < 0.001$). In models not assuming a linear dose-response trend, adults who consumed greater than one serve/day of SSB had higher BMI ($\beta = 0.61$ kg/m^2, $P < 0.001$) and WC ($\beta = 1.7$ cm, $P < 0.001$) than those who consumed less than one serve/day. Replacing 100 g SSB with 100 g water was inversely associated with BMI ($\beta = -0.07$ kg/m^2, $P < 0.001$) and WC ($\beta = -0.26$ cm, $P < 0.001$). Similarly, every 100 g substitution of SSB with coffee/tea predicted 0.07 kg/m^2 decrease in BMI and 0.24 cm decrease in WC ($P < 0.001$). BMI and WC decreased by 0.09 kg/m^2 and 0.25 cm, respectively, when milk was substituted for SSB ($P = 0.001$).

Conclusion: Our results suggest that SSB consumption is a significant predictor of obesity. Water, coffee/tea, and milk were better alternatives for SSB pertaining to obesity. The findings of this study underline the role of SSB consumption in promoting obesity, and will facilitate health researchers and policy makers to deliver sound recommendations towards SSB consumption and suitable alternatives.

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Water consumption among Australian population: Results from 2011—12 National Nutrition and Physical Activity Survey

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Background: Water consumption as a vital component of the human diet is under-researched in dietary surveys and nutrition studies.

Aim: To examine water consumption, dietary sources and sociodemographic, anthropometric and dietary correlates of water consumption among Australian population.