

Low maternal BMI and associated pregnancy outcome and fetal growth

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Objective: Pathologically low pre-pregnancy BMI is an underexplored aspect of contemporary perinatal epidemiology. We sought to determine how low prepregnancy BMI affects a variety of maternal and fetal parameters including fetal growth, maternal comorbidities, intrapartum and neonatal outcomes. Additionally, we also sought to compare weight gain patterns and attainment of the Institute of Medicine (IOM) standards for pregnancy weight gain between women with low and normal prepregnancy BMIs.

Study Design: We examined 1823 pregnancies from the POPS and LIFECODES pregnancy cohorts (Boston, MA) to evaluate the impact of prepregnancy BMI on pregnancy, intrapartum and neonatal outcomes. We compared pregnant women with a prepregnancy BMI <18.5 (underweight) to those with a prepregnancy BMI 18.5-24.9 (normal). Outcomes of interest were fetal growth, incidence of pre-eclampsia, gestational diabetes, pPROM, preterm labour, mode of delivery, delivery complications, neonatal Apgar score and birthweight. We analyzed patterns of weight gain and compared the rate of appropriate weight gain between the low and normal prepregnancy BMI groups.

Results: 92 (5%) women met criteria for low and 1730 for normal BMI. Total weight gain was equivalent (11.0 vs. 11.3 kg respectively; $p=0.24$) in both groups as was the average rate of weight gain (0.5 kg per week). Women in the low BMI group were less likely to have gestational hypertension ($p=0.03$) but the rate of preeclampsia was not significantly different in the low BMI group (4.3% vs 5.4%, $p=0.67$). Other pregnancy comorbidities occurred with equal incidence in both groups. There was no tendency for women in the low BMI group to deliver preterm ($p=0.28$). Prepregnancy BMI did not significantly affect mode of delivery ($p=0.13$). However, infants born to mothers with low BMI weighed less at birth ($p=0.03$) and had a tendency toward lower Apgar scores at 1 and 5 minutes ($p=0.05$ and $p=0.08$).

Conclusion: Prepregnancy BMI is associated primarily with infant birthweight, but not obstetric comorbidities or mode of delivery. Women with low and normal prepregnancy BMI tend to gain the same amount of weight and at the same rate during pregnancy. Our results suggest that attaining a normal prepregnancy BMI may be important for fetal growth and subsequent birthweight.