Proceedings of the Nutrition Society (2011), **70 (OCE1)**, E16 doi:10.1017/S0029665111000322

Scottish Section Meeting, 5–6 April 2011, 70th Anniversary: Nutrition and health: from conception to adolescence

Energy intake and weight gain of morbidly obese pregnant women in Liverpool

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Obesity is a major public health risk in the UK and globally. A BMI of $>29.9\,kg/m^2$ is indicative of obesity, with a BMI $>39.9\,kg/m^2$ representing morbid obesity[1]. Being obese during pregnancy can result in major complications for both mother and/or baby. For the mother, there is increased risk of gestational diabetes, type 2 diabetes, hypertensive disorders including pre-eclampsia, thrombo embolism and an increased risk of emergency caesarean or instrumental delivery[2]. Risks to the baby include macrosomia, genetic malformation, neural tube defects, stillbirth, neonatal death or late fetal death and intrauterine growth retardation[3,4]. Current American guidelines suggest that women with a BMI $>29.9\,kg/m^2$ should limit weight gain in pregnancy to 6.8 kg, for optimum birth outcomes[5,6]. There are no specific guidelines for women with a BMI $>40\,kg/m^2$, where the risks are greatly increased. The aim of this study was to estimate the nutrient and energy intake of obese pregnant women and compare intake to pregnancy weight gain and birth outcomes. Women were recruited from one antenatal clinic and asked to complete 3-d food diaries during each trimester of pregnancy. Food portion size was estimated using a food atlas[7] and the data were then analysed using Microdiet™.

Table 1. Mean energy and macronutrient intake over three trimesters

	Energy [kcal (kJ)/d]		Protein		CHO		Fat		Weight in kg	
	Mean	SD	g	% energy	g	% energy	g	% energy	Mean	SD
Trimester 1	1849 (7736.216)	590.74 (2471.65616)	71.8	15.5	252.2	51.1	68.2	33.2	110.1	15.5
Trimester 2	1984 (8301.056)	525.75 (2199.738)	78.7	15.9	260.5	49.2	76.6	34.7	114.9	14.8
Trimester 3	2066 (8644.144)	587.23 (2456.97032)	83.8	16.1	259.7	47.1	83.0	36.1	112.3	12

Data were collected for 139 pregnant women with a BMI $\geq 35\,kg/m^2$, with a mean booking-in weight of 110 kg (SD 15.5). Table 1 shows that macronutrient intake was similar to estimated average requirements (EAR), with mean total energy intake for each trimester lower than the EAR for early and late pregnancy respectively (8116.96 and 8953.76 kJ/d; 1940 and 2140 kcal/d)[8]. There was significant variation in energy intake ranging from 3195.15344 kJ/d (763.66 kcal/d) to 17330.16984 kJ/d (4142.01 kcal/d) in trimester 1 and 2021.41592 kJ/d (483.13 kcal/d) to 15102.73376 kJ/d (3609.64 kcal/d) in trimester 3. Mean maternal weight in the third trimester was 112.3 kg (SD 12.0, *n* 20) suggesting a moderate mean weight gain of 2.3 kg. Although the findings suggest significant under-reporting in this group, it also suggests that participating in the study may have had a positive effect on dietary behaviour with a significant limit in pregnancy weight gain (far less than recommended) and a balanced macronutrient intake. These findings are part of a larger on-going study and further analysis will focus on pregnancy outcomes, extent of under-reporting and the effect of dietetic input during pregnancy to encourage positive eating behaviours thereby reducing the risks of adverse pregnancy outcome.

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