Nutrient intake of pregnant women with type 1 diabetes in the DAPIT Trial; relationships with anthropometry and glycaemic control

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Nutritional composition of the diet of pregnant women with diabetes is important in maintaining optimal glycaemic control[1] and may influence birth outcome. This study examined the nutritional composition of the diets of pregnant UK women with type 1 Diabetes Mellitus (T1DM) in the 2nd trimester of pregnancy in relation to body mass index (BMI) and glycaemic control. Women were participants in a randomized controlled trial of antioxidant supplementation to prevent pre-eclampsia (DAPIT[2]). Diet was assessed using a validated self administered semi-quantitative food frequency questionnaire at an average of 26 weeks gestation. Mean daily nutrient intakes were analysed using nutritional software Q Builder Questionnaire Analysis System Version 2.0 (Tinuviel Software, UK). Statistical analysis was completed using SPSS Version 17. Dietary intake data were available for 555 women (72% of cohort), aged 30.1 (SD 5.5) years, diabetes duration of 14.5 years (SD 8.1) and HbA1c of 7.8% (range 4–13.3%; SD 1.6) at booking. Women reported adhering to a diet low in fat with mean intake of 57.7 g/day (30% of energy) and high in carbohydrate with a mean intake of 221 g/day (55% of energy) and protein with a mean intake of 74.3 g (15% of energy), with mean fibre intake of 20.6 g/day (SD 7.0), mean glycaemic index 41 (SD 7.94) and glycaemic load values 93 (SD 28.1), however average energy intake was low (mean 1612 Kcal/day; SD 439). Mean body mass index (BMI) at booking was 27 kg/m^2 (range 15.8–44.1 kg/m^2; SD 4.5) which is significantly higher than the background pregnant population[3] with a recorded BMI of 24.2 kg/m^2 (SD 4.5) ($p<0.01$). Women with higher BMI ≥ 30 required more insulin (Table 1) ($p<0.01$) as did women who gained more weight (81.6 units) throughout pregnancy ($p<0.04$) compared to those women who gained optimal weight (74.6 units/day). Women reported eating diets low in glycaemic index (GI 41; SD 7.94) and high in fibre (20.6 g: SD 7.0). Fibre intake and glycaemic control did not influence fasting blood glucose or HBA1c values at 28 weeks. These data show that over half (57%) of women with T1DM are overweight or obese prior to pregnancy. Obese women reported consuming less energy than normal weight ($P = 0.046$), however they required higher doses of insulin and gained more weight throughout. Glycaemic index and fibre intake did not influence glycaemia.

Table 1. Characteristics of women by body mass index category

	All cohort		Normal		Overweight		Obese		
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	P value
BMI* (kg/m^2)	27.0	4.5	22.8	1.5	27.3	1.4	33.8	3.4	<0.01
Weight* (kg)	72.5	12.5	62.1	5.8	73.1	6.3	89.4	12.1	<0.01
Height* (m)	164	6.9	165	6.7	164	6.3	162	8.0	0.03
Age* (yrs)	30.1	5.5	28.7	5.4	30	5.4	31.2	5.5	<0.01
Smoking (%) yes	17.3	n/a	24.1	n/a	13.1	n/a	12.2	n/a	<0.001
Breastfeeding yes	54.8	n/a	65.9	n/a	52.7	n/a	46	n/a	0.041
Duration* diabetes (yrs)	14.5	8.1	13.6	8.0	15.2	7.7	14	8.3	0.41
Insulin dose** (units)/day	61.1	16.1	62.8	21.5	76.7	36.8	92.8	44.3	<0.01

* At booking; ** at 28 weeks gestation.

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3. Heslehurst N, Ells LJ, Simpson H *et al.* (2007) *BJOG* **114**, 187–194.