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Does the diet quality of obese women deteriorate during pregnancy?

M.S. Charnley[1], A. Weeks[2] and J.C. Abayomi[1]

[1]*Faculty of Education, Community and Leisure, Liverpool John Moores University, IM Marsh Campus, Barkhill Road, Liverpool L17 6BD and* [2]*Liverpool Women's Hospital, Crown Street, Liverpool L8 7SS*

Pre-pregnancy obesity and gestational weight gain is associated with post-partum weight retention as well as serious short and long term risks for both mother and baby[(1)]. Furthermore, inadequate nutrition during pregnancy is linked to the onset of adult disease in the offspring[(2)]. Women are recommended to consume an additional 200kcals in the third trimester to offset the 70,000kcal energy cost of pregnancy[(3)]. However, this is dependent on estimated average requirements (EAR) of total energy of 2145kcals and overweight/obese women are more likely to consume in excess of this amount already. The aim of this study was to compare the energy intakes of pregnant women with a BMI $\geqslant$35 kg/m^2 in comparison to DRV's. Women were recruited from antenatal clinic at booking in appointments and completed 3 day food diaries at 3 time points during pregnancy. Full ethical approval was sought from and granted by NHS National Research Ethics Service. Data regarding food portion size was verified using a food atlas and the diaries were then analysed using Microdiet.

Table 1: Changes in maternal dietary intake between 16 weeks and 36 weeks gestation

	V1 mean (SD) (n46)	V1 % total energy	% EAR energy	V3 mean (SD) (n46)	V3 % total energy	% EAR energy	DRV/d
Total energy	1901 kcals (648·1)	NA	97·8	2003·3kcals (603·8)	NA	93·4	1945kcals/ 2145kcals*
Protein	74·4 g (21·3)	15·7	15·3	81·2 g (23·6)	16·2	15·1	51grams
CHO	262·2 g (118·6)	51·7	50·5	252·1 g (82·6)	47·2	44·1	50 % energy
Total fat	69 g (26·3)	32·7	31·9	80 g (31·2)	35·9	33·6	35 % energy
SFA	24·3 g (10·8)	11·5	11·2	30·2 g (14·1)	13·6	12·7	10 % energy
MUFA	22·1 g (9·9)	10·5	10·2	26·1 g (11·1)	11·7	11·0	NA
PUFA	12·1 g (6·4)	5·7	5·6	13·1 g (6·6)	5·9	5·5	NA

Visit 1 (V1) = 16–20 weeks, Visit 3 (V3) = 3 weeks; *3rd trimester only; DRV = Dietary reference values

Data were collected for 140 women with a BMI $\geqslant$ 35 kg/m^2 and a mean booking in weight of 110·2 kg (SD15·7). There were incomplete data sets for the dietary analysis due to high attrition; therefore, paired samples t-tests (n46) were conducted to compare mean scores for a range of macronutrient intakes between 16 weeks gestation (V1) and 36 weeks gestation (V3). Total energy intakes were slightly below EAR's and there were no statistically significance results for total energy, carbohydrate and polyunsaturated fatty acids ($P > 0{\cdot}05$). However, there were statistically significant increases for protein ($p = 0{\cdot}025$), total fat ($p = 0{\cdot}001$), saturated fat ($p = 0{\cdot}013$) and monounsaturated fat ($p = 0{\cdot}021$) between 16 and 36 weeks. The findings of this study suggest deterioration in the quality of dietary intake in women during pregnancy relative to total energy with a significant increase in SFA. These findings were supported by the follow up interviews with a subset of the women who admitted to an increase in takeaway and convenience foods as energy levels and mobility decreased as pregnancy progressed. It is recommended that pregnant women with obesity receive additional nutritional support during pregnancy to ensure optimum outcomes for themselves and their babies.

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