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Iron consumption in obese pregnant women and birth outcome

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Low BMI and iron deficiency anaemia in pregnancy are associated with increased risk of pre-term delivery (PTD) and low birth weight (LBW)^(1,2). The National Diet and Nutrition Survey (2010) found that iron intakes fell below the lower reference nutrient intake (LRNI) in 20% of adult women⁽³⁾. Other studies show that 80% of pregnant women achieve intakes less than the reference nutrient intake (RNI) for iron⁽³⁾. The aim of this study was to explore the dietary intake of obese pregnant women in relation to LBW and PTD. Women were recruited from antenatal clinic and asked to complete three-day food diaries during each trimester of pregnancy. Data regarding food portion size was verified using a food atlas⁽⁴⁾ and the diaries were then analysed using Microdiet[®]. Following delivery comparisons were made between dietary data and birth outcome data routinely recorded at delivery by the hospital. Data were collected for 139 pregnant women with a BMI $\geq 35\text{kg/m}^2$. Mean booking-in weight was 110 kg (SD 15.5).

Table 1. Mean iron intake over 3 trimesters and % of women achieving each dietary reference value⁽⁵⁾.

Iron Intake mg		<RNI (%)	<EAR (%)	<LRNI (%)
1 st trimester ^A	10.64 (SD 4.33)	86.0	68.8	29.0
2 nd trimester ^B	10.55 (SD 3.74)	89.9	67.7	23.2
3 rd trimester ^C	11.63 (SD 3.85)	81.9	54.2	15.3
Mean	10.94 (SD 3.97)	85.9	63.6	22.5

^AVisit 1 16–20 weeks gestation ($n = 93$).

^BVisit 2 28 weeks gestation ($n = 99$).

^CVisit 3 36 weeks gestation ($n = 73$).

Mean energy intakes at each trimester were similar to the estimated average requirement (EAR) of 1940–2140 kcal/d⁽⁵⁾ (1849 kcal/d; 1984 kcal/d; 2066 kcal/d respectively). Overall iron intakes were low with 63.6% achieving <EAR and 22.5% achieving <LRNI (table 1). Spearman's correlation test failed to show a significant relationship between iron intake and birth outcome (all $p > 0.05$) but all 6 women with a LBW baby (<2.5 kg) and 7 out of 8 women with pre-term delivery (<37 weeks) failed to achieve RNI for iron. The results suggest that despite a high BMI and an adequate energy intake, quality of diet may be lacking in obese pregnant women. This provides further evidence of the association between iron deficiency and LBW and PTD.

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