

Does maternal early pregnancy underweight influence neonatal birth outcome? A retrospective study in Liverpool

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Optimal neonatal birth weight is defined as between 3500 and 4000 g^(1,2). These weight gains are associated with the lowest prevalence of fetal and perinatal death⁽³⁾. Low maternal BMI and reduced weight gain during pregnancy can significantly increase the risk of low birth weight (LBW) and small for gestational age infants⁽⁴⁾. The aim of this study was to determine the prevalence of low maternal BMI at the study hospital and to explore the influence of low BMI on birth outcome. A report was compiled from the hospital database for all women booking-in for antenatal care and delivering during the 36 months from 1 January 2005 to 31 December 2007. Data requested and analysed for this study included: BMI, maternal age, parity, maternal smoking, gestational age at delivery, any recorded IUGR, mode of delivery, birth weight, neonatal gender, admission to NICU and date of delivery. Women were categorised according to BMI using WHO (2000) classification and χ^2 test was used to test for possible associations between the variables.

Table 1. The distribution (%) of maternal first trimester BMI according to infant normal weight and all classes of LBW

Maternal BMI kg/m ²	Normal (or above) BW	LBW (all classes)
<18.5	86.1	13.9
18.6–19.9	91.3	8.7
20.0–24.9	92.5	7.5
>25.0	94.7	5.3

Data were extracted for 23 893 women who had booked-in for antenatal care and delivered at the study hospital. Mean age was 28.95 years (SD 6.14); mean weight was 69.28 kg (SD 15.8), with a mean BMI of 25.72 kg/m² (SD 6.41). From the sample 9.3% were classed as underweight (most (6.3%) having a BMI of 18.6–19.9 kg/m²). Mean birth weight was 3343 g (SD 639). The majority of infants (91.4%) were at or above normal birth weight; but 5.6% were classified as LBW (<2500 g) and 0.8 and 1.0% classified as Very LBW (VLBW, <1500 g) and Extremely LBW (ELBW, <1000 g) respectively, giving a total of 7.4% underweight. A positive relationship was found between low maternal BMI and incidence of LBW ($P<0.001$) (Table 1). These results suggest a considerable burden on NHS resources with 583 LBW babies born at the hospital each year. Antenatal dietetic intervention could promote optimal weight gain, reducing this risk. Studies in USA and Canada show a 50% reduction in LBW following dietary supplementation^(5,6). This would not only improve maternal and fetal health in both the short- and long-term; it could also save the NHS a considerable amount of money.

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