Maternal obesity and selected pregnancy risks and outcomes in nulliparous mothers in Queensland, 2008

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The increasing prevalence of obesity means there is a greater incidence of obesity in women of childbearing age[1]. Maternal overweight and obesity increase the risk of pregnancy complications and adverse pregnancy outcomes such as gestational diabetes and hypertension, increased risk of caesarean delivery, postpartum haemorrhage, induction of labour, shoulder dystocia and macrosomia[1-4]. This analysis examined the associations between maternal body mass index (BMI) and pregnancy risk factors in Queensland.

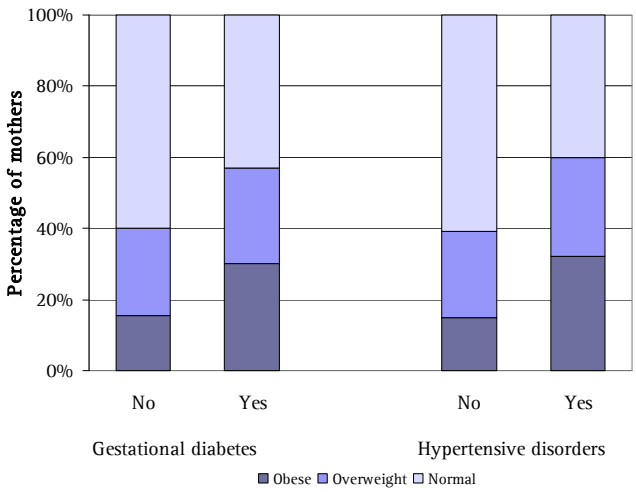
Data from the 2008 calendar year in the Queensland Perinatal Data Collection were analysed to determine whether there were differences in the distribution of BMI between mothers who experienced selected pregnancy risk factors and outcomes and those who did not. Specifically, the risks and outcomes assessed were gestational diabetes, hypertensive disorders of pregnancy*, induction of labour, shoulder dystocia, postpartum haemorrhage, length of gestation, and baby's birth weight. The analysis was conducted on nulliparous† mothers younger than 35 with singleton births to control for factors such as age and previous births which may also be associated with BMI and these outcomes.

Self-reported weight and self-reported or measured height are recorded in the QPDC and were used to calculate BMI at the time of conception[5]. Categories of BMI were defined as underweight or normal (<25 kg/m^2, hereafter referred to as normal), overweight (25-<30 kg/m^2), and obese (≥30 kg/m^2)[6]. Onset of labour was classified as spontaneous, induced and no labour; baby weight was categorised as less than 2,500 grams, 2,500-4,000 grams, greater than 4,000 grams[2,4]; and gestation was categorised as less than 37 weeks and 37 or more weeks.

In 2008, there were 19,983‡ nulliparous mothers less than 35 years of age with singleton births. The proportions of mothers with gestational diabetes and gestational hypertension were 4.3% and 7.8% respectively. Mothers who were obese at the time of conception were 2.6 times more likely to have gestational diabetes (95%CI 2.2-3.0), and 2.9 times more likely to experience gestational hypertension (95%CI 2.6-3.3) than mothers with a normal BMI at the time of conception (Figure 1).

There were differences in the distribution of BMI categories by the type of onset of labour. In 2008, 12,208 mothers experienced spontaneous labour, and 13.2% of these had a BMI categorised as obese at the time of conception (Figure 2). The proportions of mothers who were obese were higher in those who were induced or had no labour; 21.4% and 20.0% respectively.

Figure 1. Distribution of BMI categories in mothers with and without gestational diabetes or gestational hypertension, Queensland 2008



Source: Queensland Perinatal Data Collection, Queensland Health (extracted 21st December 2009; updated May 2010)

Maternal overweight and obesity at the time of conception was associated with postpartum haemorrhage; however the effect was small (Figure 3). Women who were obese were 1.3 times more likely to have a postpartum haemorrhage (95% CI 1.1 -1.5) than those with a normal BMI at the time of conception.

* Includes gestational hypertension, pre-eclampsia, pre-eclampsia imposed on chronic hypertension and eclampsia
† Nulliparous: of, relating to, or being a female that has not borne offspring
‡ Data extracted on 21st December 2009 are not finalised and subject to change; figure updated May 2010

In Queensland in 2008, there were 2,196 singleton babies born weighing more than 4,000 grams. Mothers giving birth to macrosomic babies were more likely to be obese than mothers giving birth to babies weighing 4,000 grams or less. Of those mothers who gave birth to a baby weighing more than 4,000 grams, 23.6% were obese. This was in comparison with 15.4% and 14.7% of mothers who gave birth to babies weighing 2,500-4,000 grams and less than 2,500 grams respectively (Figure 4). The underweight BMI category was also included separately in this particular analysis. This showed that women who were underweight at the time of conception were more likely to give birth to a baby weighing less than 2,500 grams.

Length of gestation and shoulder dystocia were not found to differ with BMI. The distribution of BMI categories was similar regardless of the length of gestation (in categories) or whether or not shoulder dystocia was experienced.

In Queensland during 2008, obesity at the time of conception was associated with several selected pregnancy and delivery complications in nulliparous mothers younger than 35 with singleton births. However, no association was found between BMI at the time of conception and the length of gestation or shoulder dystocia.

References

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5. Howell S. Technical notes on compliance with the maternal height and weight measures (at the time of conception) included in the Queensland Perinatal Data Collection (QPDC) from July 2007. *Technical Report #4*: Queensland Health, July 2009.
6. Queensland Health. The Health of Queenslanders 2008: Prevention of Chronic Disease. Second Report of the Chief Health Officer Queensland. Brisbane, 2008.

Figure 2. Distribution of BMI categories by onset of labour, Queensland 2008

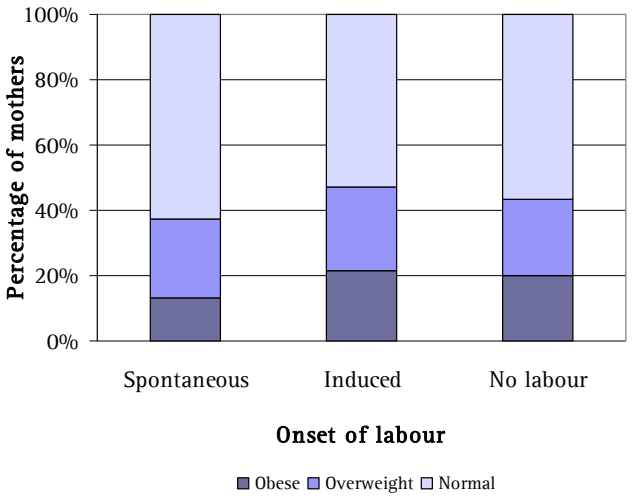


Figure 3. Distribution of BMI categories in mothers with and without postpartum haemorrhage, Queensland 2008

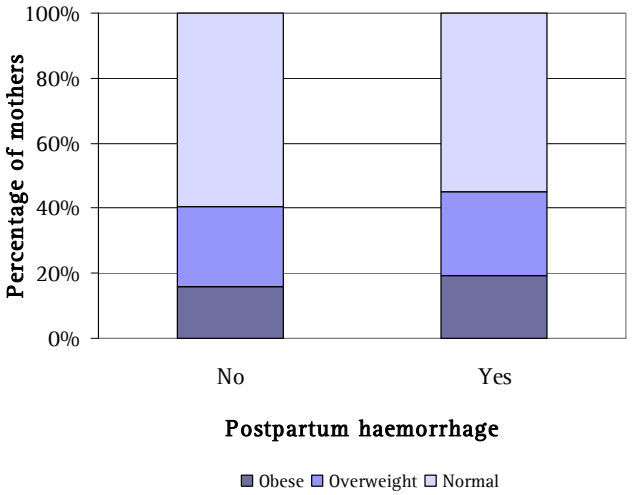
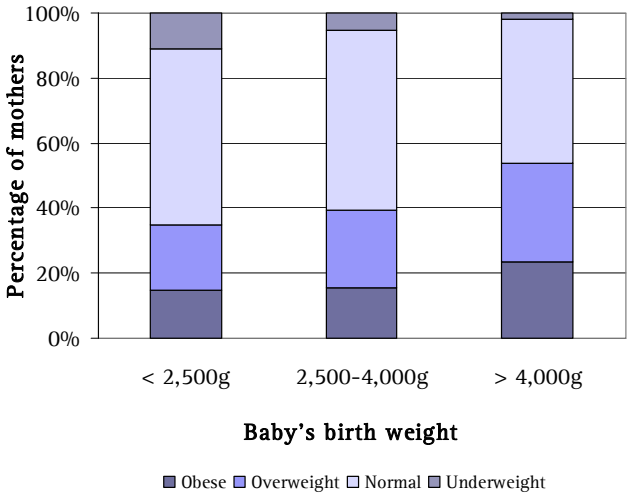


Figure 4. Distribution of BMI categories by baby's birth weight, Queensland 2008



Source: Queensland Perinatal Data Collection, Queensland Health (extracted 21st December 2009; updated May 2010)