

Obesity in pregnancy

Dr Paul Howat
FRANZCOG

The following tales of three morbidly obese women, whose care I have provided in the last few years, illustrate the problems obesity causes for the obstetrician. The names and some details have been altered to protect patients' privacy, but the clinical events are factual.

Shirelle was a 19-year-old primigravida with a body mass index (BMI) of 49. After induction of labour at 41 weeks for post dates, she required a caesarean section for failure to progress in the second stage. Epidural anaesthesia was successful after one hour and five attempts. The fetal head was by this stage deeply impacted and two experienced operators delivered the 5.5 kg baby with difficulty. The primary operator's arm was inserted to her shoulder due to the extreme thickness of the patient's abdominal wall fat layer. Three days after surgery, the patient developed necrotising fasciitis and sloughed half of her abdominal wall. After multiple wound debridement, reconstructive surgery, skin grafts and a prolonged stay in intensive care, the patient was discharged home three months later.

'Education about diet and exercise needs to start early in life, as recent generations of parents lack the skills and knowledge to pass onto their own children.'

Shy-Anne was a 25-year-old primigravida, 142 cm tall and weighing 132 kg (BMI 65.5). After spontaneous labour, she required a caesarean section for failure to progress, non-reassuring CTG and failed attempts to perform scalp sampling, due to obesity impeding access to her vagina with an amnioscope. Spinal anaesthesia was chosen because of the fear of encountering airway difficulties due to her small mouth and restricted airway. Multiple attempts failed – the distance between skin and spine exceeded the longest spinal needle available. Tension developed between obstetric and anaesthetic staff due to the delay in commencing surgery. The fetal heart rate could not be monitored externally and fetal wellbeing could not be assessed. Over an hour later, intubation and general anaesthesia were performed. Extreme difficulty with both were encountered, as feared. The long delay in securing anaesthesia resulted in a severely acidotic baby requiring admission to the neonatal intensive care unit. The mother suffered severe aspiration pneumonitis and required admission to intensive care. Both the patient and her partner were angry and aggressive towards the obstetric staff involved in their care. Attempted explanations about the difficulties encountered brought howls of derision and accusations of discrimination against overweight people.

Lolita was a 22-year-old Indigenous primigravida presenting for her first antenatal visit at 28 weeks. Her BMI was 60. She did not have a general practitioner. First visit BP was 150/100 mm Hg with a large cuff. Urinalysis showed proteinuria 4+ and a subsequent 24-hour urine collection confirmed proteinuria of 1200 mg/24 hours. No evidence of pre-eclampsia was present clinically or on serum biochemistry. A glucose tolerance test (GTT) confirmed the

diagnosis of pre-existing type 2 diabetes mellitus with diabetic nephropathy already apparent. Lolita gave birth by caesarean section to a 5 kg infant with sacral agenesis, undetected on ultrasonography, where poor views were noted. At age 27, Lolita was requiring renal dialysis and awaiting renal transplant.

These are all cases I have managed at Cairns Base Hospital in the last few years. Sadly, there are many more complicated cases with unfavourable outcomes I could have chosen to discuss, but these are some of the most memorable. Not all cases are so extreme, but they serve to illustrate a problem which will only become worse. Obesity is increasingly common in our society and in the pregnant population. It is a public health issue which will continue to place pressure on the health budget and cause anxiety among the health professionals caring for these women in pregnancy, unless something can be done to address this epidemic.

Obesity is defined as a BMI of greater than 30 kg/m². An estimated 21 per cent of the UK and 25 per cent of the USA have a BMI of greater than 30. Changing cultural and economic conditions throughout the world have led to an increase in the rates of obesity. Changing patterns of nutrition and physical activity appear to be the cause. In Western countries, obesity is more common in women of lower socio-economic backgrounds. Poverty in these countries is associated with obesity, whereas in the past, it was associated with malnutrition (as it is in developing countries).

Obesity in pregnancy carries an entire range of increased risks for the mother and her baby.

Physical and metabolic effects

Obesity is associated with maternal hyperinsulinaemia and insulin resistance in the mother. Fetal hyperinsulinaemia leads to fetal macrosomia. It has been proposed that placental oxygen supply may not be sufficient for a macrosomic fetus and this mechanism may be responsible for stillbirths. Maternal cardiac output is increased by 30 to 50 ml/min for every additional 100 g of fat gain. Maternal heart rate increases, which results in decreased myocardial perfusion.

Maternal complications

Hypertension is associated with obesity and the risk increases with BMI. Pre-eclampsia is also increased and the risk doubles with each 5 to 7 kg/m² increase in BMI. Thromboembolism is doubled compared to the non-obese population. There is a three to four-fold increase in gestational diabetes. In maternal death figures from the UK and USA, obesity rates are much higher in death cases compared to the normal pregnant population. In the UK, the proportion of obesity associated with maternal deaths is increasing compared to previous years.

Fetal complications

There are conflicting studies regarding the rates of fetal malformation in obese women. The evidence appears to suggest, from better studies, that there is not an increase when conditions such as pre-existing diabetes are excluded. Assessment of the fetus on ultrasound is more likely to be suboptimal and hence anomalies are more likely to be missed. Fetal macrosomia is of course

increased and stillbirth rates have been reported as being up to three times higher in obese women. Tragically for the offspring and for society (and future obstetricians), there is a nine-fold increase in subsequent childhood and adult obesity.

Reproductive complications

Obese women are more likely to experience amenorrhoea and infertility is more common. Assisted fertility treatment is less successful in obese women. Miscarriage rates in both spontaneous and assisted pregnancies are increased, with rates of 25 to 37 per cent having been reported.

Birth

Although antenatal problems related to obesity are significant, it is those problems encountered during birth that lead to the greatest worry for the caregivers and which contribute to the cost of care.

An obese woman is usually less mobile and flexible than a woman with a normal BMI. Adopting different positions may be impossible and this can lead to difficulties for the caregiver in providing optimum care. External fetal heart rate monitoring and tocography may be difficult or even impossible.

'Tragically for the offspring and for society (and future obstetricians), there is a nine-fold increase in subsequent childhood and adult obesity.'

Induction of labour is increased by 36 per cent, and unfortunately, failed induction rates are increased by 15 per cent, meaning we are more likely to have to perform the caesarean section that we are dreading. Both elective and emergency caesarean section rates are increased. Rates of third and fourth degree perineal tears are increased. Primary postpartum haemorrhage rates are higher by an order of 30 to 70 per cent. For those obese women attempting a vaginal birth after caesarean (VBAC), the success rate is reduced by 50 per cent.

Our anaesthetic colleagues share our woes when it comes to the care of obese women at birth. Epidural failures are common and as detailed in one of the cases above, airway difficulties can be extreme. Aspiration pneumonitis is common with general anaesthesia in obese women. Peripheral intravenous access can be difficult to obtain and accurate blood pressure monitoring may be difficult.

When it comes to surgery, the obstetrician is faced with the physical problem of obtaining access to the peritoneal cavity and delivering what may well be a very large baby. The abdominal fat pannus may be oedematous and off-centre, raising the problem of locating the incision correctly. The fat pannus can be retracted and taped or held caudally, but this can interfere with the ability of the mother to breathe or be ventilated. Occasionally, a vertical abdominal skin incision may be preferred. Physically extracting a baby from a deep wound can be very demanding for the obstetrician, requiring strength and dexterity. The effort required is not without risk to the operator's health in terms of muscle and tendon strain. Postoperatively, endometritis and wound infection are more common. There is an increase in febrile morbidity, atelectasis and length of hospital stay.

Obesity is a pandemic in Western society and will only get worse unless the cultural and social habits relating to food and exercise are addressed. Unfortunately, intervention programs are unlikely to be successful. Education about diet and exercise needs to start early in life, as recent generations of parents lack the skills and knowledge to pass onto their own children. By the time an obese woman is pregnant it is too late for prevention and all we can do as obstetricians is deal with the consequences and the risks as best we can. As it is mainly confined to the lower socio-economic classes, the impact of obesity in pregnancy is likely to be felt mainly in the public hospital sector. This impact, in terms of cost to the public purse and stress for the caregivers, cannot be underestimated.

Since commencing this article, I have encountered another patient in our unit who frankly terrifies me. Transferred from a rural hospital because of the risk, this 44-year-old woman with eight previous vaginal births is unexpectedly pregnant after ten years. She is 162 cm tall and weighs 170 kg. We cannot take her blood pressure – even a thigh cuff is too small. We cannot measure the fetal heart by external means – it is undetectable. She is almost immobile due to her obesity and a cerebral vascular accident (CVA) suffered after her last pregnancy. Her fat pannus, which reaches her ankles when standing, is infected and ulcerated. We are unable to perform a vaginal examination – she cannot lie flat and her obesity precludes a digital examination. She is breathless when sitting and has no exercise tolerance. It will be impossible to monitor her or her baby effectively and safely in labour. A caesarean section would be a nightmare for the obstetrician and the anaesthetist – I am not even sure if it is possible given her size, shape and morbidity. My fear is that this woman will die during birth and that there is nothing we can do to prevent this. This is an extreme case I know, but a salutary example of the endpoint of the 'fast food and no exercise' culture pervading Western society.

References

1. Hall LF, *et al.* Obstetrical and Gynecological Survey. *Obesity and Pregnancy*, April 2005; p 253-260.
2. Yu C KH, Robinson S. Obesity in Pregnancy. *British Journal Obstetrics and Gynaecology*, Volume 13, 2006; p 1117-1125.
3. Chu S, *et al.* Maternal obesity and risk of stillbirth: a metaanalysis. *American Journal of Obstetrics and Gynecology* September 2007; Volume 197(3); p 223-228.
4. Reece E. Perspectives on obesity, pregnancy and birth outcomes in the United States: The scope of the problem. *American Journal of Obstetrics and Gynecology* January 2008; Volume 198(1); p 23-27.

Medical pamphlets

RANZCOG members who require medical pamphlets for patients can order them through:

Mi-tec Medical Publishing

PO Box 24

Camberwell Vic 3124

ph: +61 3 9888 6262

fax: +61 3 9888 6465

Or email your order to: orders@mitec.com.au

You can also download the order form from the RANZCOG website: www.ranzcog.edu.au