

Review

Optimizing the outcome of pregnancy in obese women: From pregestational to long-term management

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Abstract

The obesity epidemic is of some concern in women of reproductive age. Maternal obesity is associated with many pregnancy complications, especially gestational diabetes and hypertensive disorders of pregnancy. Delivery in obese women is characterized by a high caesarean-section rate and an increased risk of anaesthetic and postoperative complications. Weight retention after birth may increase the risk of type 2 diabetes in the long term. Foetal risks include macrosomia, malformations and increased perinatal mortality, with the long-term infant health marked by a higher risk of obesity and metabolic disorders. Optimal management includes preconception counselling, pregravid weight-loss programmes, monitoring of gestational weight gain, repeated screening for pregnancy complications and long-term follow-up to minimize the social and economic consequences of pregnancy in overweight women.

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Résumé

Optimiser le devenir de la grossesse chez la femme obèse : de la programmation à la prise en charge à long terme.

L'épidémie d'obésité concerne les femmes en âge de procréer. Lors de la grossesse, l'obésité maternelle est associée à de nombreuses complications dominées par le diabète gestationnel et les troubles hypertensifs. L'accouchement chez la femme obèse est caractérisé par un taux de césarienne élevé et un plus grand risque de complications anesthésiques et postopératoires. La rétention pondérale après l'accouchement peut majorer le risque ultérieur de diabète de type 2. Les risques fœtaux incluent la macrosomie, les malformations et une mortalité périnatale accrue et la santé de l'enfant à long terme est marquée par un risque plus élevé d'obésité et de troubles métaboliques. Une prise en charge optimale inclut un conseil préconceptionnel avec intervention diététique, une surveillance de la prise de poids en cours de grossesse, un dépistage répété des complications et un suivi à long terme, afin de minimiser les conséquences sociales et économiques des grossesses survenant chez les femmes en surpoids.

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In France, the number of obese individuals increases by more than 15% every three years, and the prevalence of childhood obesity has tripled over the past 15 years, now reaching 5%, with a further 11% of children being overweight. Maternal obesity before and during pregnancy has a considerable impact on the course of pregnancy as well as on the development of the foetus,

the condition of the infant and its future health (Table 1). This evidence highlights the importance of appropriate management of high-risk pregnancies due to excess weight in the mother.

1. Maternal complications

1.1. Impaired glucose tolerance

Excess weight increases the risk of glucose intolerance. Even in moderately overweight subjects [body mass index (BMI)

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Table 1
Complications of pregnancy in obese women

Maternal complications	Infant complications
Gestational diabetes	Macrosomia
Hypertension	Shoulder dystocia and risk of brachial plexus trauma
Preeclampsia	Neural-tube defects (spina bifida)
Sleep apnoea	Cardiac malformations
High caesarean-section rate	Late foetal death
Infection	Childhood obesity
Thromboembolism	
Postpartum weight retention and risk of type 2 diabetes	

25–30 kg/m² or weight 120–150% of ideal body weight], the incidence of gestational diabetes mellitus (GDM) is 1.8 to 6.5 times greater than that in normal-weight subjects [1]. In obese women (BMI > 30 or weight > 150% of ideal body weight), the incidence of GDM is 1.4- to 20-fold higher than in normal-weight subjects [1]. Gestational diabetes mellitus is classically diagnosed by an oral glucose challenge at week 24 of gestation, but can arise much earlier in obese women and, thus, often remains unrecognized until it is too late for optimal management [2]. Gestational diabetes mellitus results from an imbalance between pregnancy-induced insulin resistance, exacerbated by the weight excess, and the relatively insufficient compensatory hyperinsulinism. An android fat distribution clearly favours the development of GDM: a significant correlation was found between blood glucose levels after an oral glucose challenge and prepregnancy waist circumference (or waist-to-hip ratio) in the mother [3].

1.2. Renovascular complications

Excess weight increases the prevalence of hypertension and toxæmic syndromes in pregnancy. In the moderately overweight, the incidences of hypertension and toxæmic syndromes are 2.0–3.7 and 1.5–1.9 times higher, respectively, than in control subjects [4–6]. In obese women, the incidence of hypertension is multiplied by a factor of 2.2–21 and that of toxæmia by a factor of 1.2–9.7 [1,4–8]. Obese women have a two- to fivefold higher incidence of preeclampsia (hypertension with proteinuria) during pregnancy [4,7].

Obesity appears to promote hypertension independently of other determinants, such as gestational diabetes. Obese pregnant women are at higher risk of venous thromboembolic events, mainly due to haemoconcentration, and also have a higher incidence of urinary tract infection [7].

1.3. Respiratory complications

The relationship between obesity and sleep apnoea is well documented. Excess weight reduces thoracic-wall compliance and increases airways resistance. Sleep-disordered breathing and snoring are common in pregnancy and narrower upper airways were demonstrated during the third trimester of pregnancy [9]. Women with higher baseline BMIs and greater increases

in neck circumference during pregnancy report higher apnoea symptom scores [10], and preeclamptic toxæmia is associated with a high-respiratory disturbance index [11]. Sleep apnoea should be looked for in obese women if either foetal growth retardation or hypertension is detected [7,12].

1.4. Complications and morbidity during delivery

Obese women have a higher frequency of induced labour and more caesarean sections than normal-weight women. Commonly reported indications for caesarean delivery include cephalopelvic disproportion, failed cervical dilatation, foetal distress and risk of shoulder dystocia [7,13]. Caesarean-section practices vary widely, but around one in two severely obese women (BMI > 40 kg/m²) is delivered by C-section and each one-unit increase in pregravid BMI increases the risk of a caesarean delivery by 7% [14]. This higher caesarean delivery rate is driven by prepartum complications of obesity: in the severely obese, caesarean sections represent around 40% of deliveries in the presence of no other risk factors, 44% in case of concomitant hypertension, 50% in case of preexisting or gestational diabetes, and 59% in class 3 obesity (BMI ≥ 40 kg/m²) with concomitant hypertension and diabetes [15].

Anaesthesia risks are high in obese patients who pose technical challenges. Difficulties in inserting epidural catheters include positioning the patient correctly, identifying the midline, identifying the epidural space and dislodging the catheter. Regional anaesthesia is preferred for caesarean sections, as obesity is characterized by an increased incidence of difficult intubation, rapid desaturation and an increased risk of aspiration during anaesthesia [16].

Although most obese patients receive Pfannenstiel's incision, whether the incision is transverse or vertical remains a matter of controversy, particularly in the severely obese. The advantages of a transverse incision in terms of postoperative pain, and a lower risk of hypoxia and atelectasis, are offset, in some studies, by a higher postoperative infection rate. Incision-site infections are two to three times more frequent in overweight women. Postoperative morbidity is further increased by a higher thromboembolic risk and longer operating time, with more blood loss, which prolongs hospitalization [13].

2. Infant complications

2.1. Macrosomia and neonatal morbidity

Prepregnancy obesity considerably increases the risks of macrosomia and associated shoulder dystocia, observed in 33% of infants weighing more than 4.5 kg compared with only 2% among those under this weight at birth [13,17,18]. Even being moderately overweight (BMI 25–30 kg/m²) increases the risk of macrosomia [1] and the incidence is multiplied by 1.4–18 in obese women, depending on the degree and type of obesity. A prospective study showed that a 0.1 increase in prepregnancy waist-to-hip ratio predicted an increase of 120 g in body weight, 0.51 cm in height and 0.31 cm in head circumference in the newborn [3]. The risk of macrosomia persists even in the absence

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