Pregnancy in women with type 2 diabetes: an uncertain prognosis

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SUMMARY
The increasing prevalence of type 2 diabetes in women of childbearing age leads to an increasing number of pregnant women with type 2 diabetes. Pregnancy complicated by type 2 diabetes is a high-risk pregnancy, associated with birth defects and high perinatal mortality to the same extent as in type 1 diabetes. Until now, most attention was directed toward women with type 1 diabetes. Recent data stresses the urgent need to develop better screening and efficient care strategies in women with type 2 diabetes, who also display many risk factors for adverse fetal outcome. Family physicians, diabetologists and gynaecologists must be aware of this growing concern. Improvement of pregnancy planning, adequate metabolic control from conception to delivery and a multi-disciplinary team approach to care should improve fetal and maternal outcomes. Furthermore, diabetes screening in high-risk women prior to pregnancy is warranted.

Key-words: Pregnancy · Type 2 diabetes mellitus · Perinatal mortality · Congenital anomaly.

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RÉSUMÉ
La grossesse chez les femmes diabétiques de type 2 : un prognostic incertain
L’émergence du diabète de type 2 dans une population en âge de procréer conduit à la prise en charge croissante de grossesses compliquées d’un diabète de type 2. Comme dans le diabète de type 1, elles constituent des grossesses à haut risque en terme de malformations congénitales et de mortalité périnatale. Si jusqu’à présent les efforts se sont presque exclusivement concentrés sur les patientes présentant un diabète de type 1, des données récentes soulignent l’urgence de prêter attention aux patientes présentant un diabète de type 2 qui cumulent par ailleurs les facteurs de risque périnatal. Les médecins généralistes, les diabétologues et les gynécologues doivent être informés et mobilisés dans la prévention du risque maternel et foetal. Des efforts conséquents doivent être engagés pour favoriser la programmation des grossesses, l’obtention d’un équilibre glycémique optimal depuis la période pré-conceptionnelle jusqu’à l’accouchement et une prise en charge multidisciplinaire. De plus, il est recommandé de dépister le diabète chez les femmes à risque avant la grossesse.

Mots-clés : Grossesse · Diabète de type 2 · Mortalité périnatale · Malformations congénitales.

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In spite of the great improvement in fetal outcome over the past 30 years, pregnancy complicated by pre-existent diabetes mellitus remains a high-risk pregnancy [1]. In population studies, the malformation rate is still higher with a 3 to 10-fold increase risk compared with the general population. Furthermore, these congenital malformations contribute predominantly to the excess perinatal mortality. The role of periconceptional glycaemic control is well established in deficient organogenesis and we know the major influence of effective pregnancy planning in reduction of fetal risks [2]. Up to now, most attention was directed toward women with type 1 diabetes. However, the increasing prevalence of type 2 diabetes in young population, especially in women of childbearing age [3], and the trend toward older women giving birth, lead to a growing number of pregnant women with type 2 diabetes [4]. Recent studies emphasize adverse fetal outcome in pregnancy complicated by type 2 diabetes, as well as maternal morbidities; they stress the urgent need to develop better screening and efficient care strategies [5].

Epidemiology

It is difficult to estimate the true prevalence of type 2 diabetes in pregnancy for several reasons. First, many patients with gestational diabetes (GD) are likely to have pre-pregnancy type 2 diabetes, particularly those who are diagnosed before 20 weeks of gestation or who have fasting hyperglycemia and those with diabetes persisting on early postpartum testing. Second, without universal screening for GD, type 2 diabetes might go undiagnosed throughout pregnancy. A third limitation is the scarceness of prospective studies. Nevertheless, pregnancy complicated by type 2 is obviously more common that previously believed. In a recent French multicentric survey, about 34% of women with pre-pregnancy diabetes had type 2 diabetes [6]. For specific populations in which the prevalence of type 2 is particularly frequent, more than half of the pregnant diabetic women could in fact have type 2 diabetes [4], as it was reported in a Japanese study where type 2 accounted for about 70% [7]. This trend could soon be observed in caucasian population in which type 2 diabetes is now diagnosed earlier than before. In pregnant Native Canadians, the overall prevalence of diabetes (type 2 and GD) was 11.6% with a type 2 prevalence of 3.2%. Prevalence rates increased with age, peaking at 46.9% in the age-group ≥ 35 years [8]. Only one study has measured the prevalence of type 2 diabetes during pregnancy, not in a selected population, but in a nationwide population based survey. In this report, the authors estimated that in 1988, 0.5% of all pregnancies in the US were complicated by pregestational diabetes and that type 2 accounted for 65% of them, compared with only 26% in 1980 [9]. GD was present in 3.5% of all pregnancies.

Maternal characteristics

Pregnant women with type 2 diabetes differ from those with type 1 disease in a number of characteristics, each of which may be related to pregnancy outcome, including maternal age, maternal weight and parity. They tend to be older, heavier, of greater parity [10, 11]. Indeed, beyond diabetes, pregnant women with type 2 diabetes display many risk factors for fetal adverse outcome. In particular, maternal age and obesity are both associated with an increased risk of perinatal mortality [12]. Furthermore, in many countries type 2 diabetes is associated with low socioeconomic status which may confer added risk [11, 13].

One study has studied the prevalence of maternal diabetes complications [7]. Surprisingly, it was similar between mothers with type 1 and type 2 diabetes. Non proliferative retinopathy was seen in 28% of women with type 2 while proliferative retinopathy was present in 4.3%, often detected for the first time during pregnancy. Therefore, as in women with type 1 diabetes, complications must be carefully assessed before and throughout pregnancy in type 2.

Pre-eclampsia is 2 to 3 times more common in women with type 2 diabetes than in non diabetic women [5, 13], as quite high as in women with type 1 diabetes [14]. If hypertensive disorders of pregnancy are related to diabetes duration and pre-existing nephropathy in type 1 diabetes, obesity and insulin resistance could play a role in type 2 [15].

Fetal complications

Because of lack of preconceptional optimal care, type 2 diabetes is associated with an increased risk for major congenital anomalies, that is mostly in the range reported for pregnancies complicated by type 1 diabetes [5, 11, 16]. Dunne has recently reported that women with type 2 diabetes have up to a 11 times greater risk of a congenital malformation compared with the general population [5]. These congenital anomalies affect the same organ systems that have been previously described in pregnancies complicated by type 1 diabetes. The most commonly affected organ systems are the cardiac, musculoskeletal and central nervous systems and anomalies involving multiple organ systems [17]. The risk in individual patients appears to be related to poor maternal glycemic control during the critical period of organogenesis, rather than to the mode of antidiabetic therapy during early pregnancy [18]. Shaefer-Graf et al. have proposed the threshold of an initial fasting glucose level of 120 mg/dL to assess clinical risks for embryogenesis [17]. In addition, poor attendance for pre-pregnancy care and late booking for antenatal care may contribute to these adverse outcomes [10, 19].

Perinatal mortality is substantially higher than that in the general population, mainly owing to an excess of late fetal death (increased seven-fold) in a large cohort of women from New Zealand [11]. In that study, maternal obesity may
be an important contributor to this high perinatal mortality. Other maternal factors, including higher age, higher frequency of hypertension, low socioeconomic status are likely to contribute to the increased mortality rate [11]. Last, offspring of pregnancies complicated by type 2 diabetes are more to be delivered before 37 weeks of gestation [5, 10].

Recommendations

In many countries, young women with type 2 diabetes are more likely to be from populations in which cultural or socioeconomic factors might prevent access to care including diabetes screening, pre-pregnancy counseling and careful antenatal care. Family physicians, diabetologists and gynecologists must be aware of this growing concern. A better recognition of diabetes before pregnancy in women at high risk (because of obesity, family history of type 2 diabetes, personal history of GD), the achievement of near normal glycemic control during the organogenesis period and a careful obstetric surveillance should improve maternal and fetal outcomes in pregnancies complicated by type 2 diabetes. Because of concern about the risk of teratogenicity and neonatal hypoglycemia, it is usual to switch from oral hypoglycemic treatment to insulin as soon as possible, at best prior to conception. Recent data has suggested that some oral hypoglycemic agents could be an effective alternative to insulin therapy in women with GD or with type 2 diabetes [20]. Future will tell if some of these drugs can be used effectively and safely in pregnant women with type 2 diabetes, which will make easier the management of diabetes in this population. The frequency of self blood glucose monitoring must be increased up to six times per day, including post prandial testing. Insulin administration needs to be individualized and continuously adjusted to achieve optimum glycemic control: < 95 mg/dl in the fasting state, ≤ 140 mg/dl at 1h and/or ≤ 120 mg/dl 2 h after meals. Moreover, nutritional therapy is the cornerstone of treatment in women who are commonly overweight. Pregnancy provides a unique opportunity to instruct patients in lifestyle behaviors aimed at reducing excessive weight and increasing physical activity.

Conclusions

The increasing prevalence of type 2 diabetes in women of childbearing age leads to a growing number of pregnant women with type 2 diabetes. Pregnancy complicated by type 2 diabetes is a high-risk pregnancy, associated with birth defects and fetal death to the same extent as type 1 diabetes. Such problem underlines one more time the urgent need to develop strategies to prevent obesity, insulin resistance and diabetes in young populations. Efficient pre-pregnancy care needs to be strongly encouraged in women with type 2 diabetes who also display many risk factors for adverse fetal outcome. Family physicians who see these patients before pregnancy must be aware of this growing concern and involved in the prevention of fetal and maternal risks. Improvement of pregnancy planning, adequate metabolic control from conception to delivery and a multi-disciplinary team approach to care are warranted. Furthermore, diabetes screening in high-risk women prior to pregnancy should contribute to improve fetal and maternal outcomes.

References


