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Guidelines/Recommandations

Management of pregnancy in women with type 1 diabetes mellitus: Guidelines of the French-Speaking Diabetes Society (Société francophone du diabète [SFD])

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Abstract

Aim. – The clinical guidelines reported by the French-Speaking Diabetes Society (Société francophone du diabète) include updated recommendations for preconceptual planning and care in the management of pregnancy in women with type 1 diabetes mellitus (T1DM).

Methods. – The working group included diabetologists, as well as an obstetrician, a nurse and a dietician. A review of the literature was performed using PubMed and Cochrane databases. Guidelines published by foreign diabetes societies were also consulted.

Results. – In women with T1DM, pregnancy increased the risks of hypoglycaemia, diabetic ketoacidosis, pregnancy-induced hypertension, infections and worsening of diabetic microvascular disease. Moreover, T1DM during pregnancy had an impact on the embryo and the fetus, and may have increased the risk of spontaneous miscarriages, malformations, premature births, and fetal and neonatal complications. However, intensive glycaemic control and preconceptual care have been shown to decrease the rate of fetal demise and malformations. Also, the use of insulin analogues during pregnancy is now regarded as safe. Tight glucose control and frequent follow-up are recommended throughout pregnancy in women with T1DM. Their obstetric management should take place in a maternity hospital with an appropriate perinatal environment and in close collaboration with diabetologists.

Conclusion. – Pregnancy planning and adequate management during pregnancy are mandatory for improving the outcomes of women with T1DM.

Keywords: Pregnancy; Type 1 diabetes; Guidelines; Review

Résumé

Prise en charge de la grossesse au cours du diabète de type 1.

But. – Ce référentiel de la Société francophone du diabète a pour objet de préciser les modalités de la prise en charge préconceptionnelle et pendant la grossesse des femmes atteintes de diabète de type 1 (DT1).

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Méthodes. – Le groupe de travail a été constitué de diabétologues, d'un obstétricien, d'une infirmière et d'une diététicienne. La revue de la littérature a été faite à partir des banques de données PubMed et Cochrane. Les recommandations émanant de sociétés de diabétologie étrangères ont également été consultées.

Résultats. – Chez les femmes qui ont un DT1, la grossesse comporte des risques pour la mère et l'enfant. Chez la femme, il existe un risque accru d'hypoglycémies, d'acidocétose, d'hypertension artérielle gravidique, d'infections et d'aggravation des complications microvasculaires. Le diabète augmente également les risques de fausse couche spontanée, de malformations, de prématurité et de complications fœtales et néonatales. Il est établi qu'une prise en charge préconceptionnelle et qu'un bon contrôle glycémique diminuent les risques de mort fœtale et de malformations. L'utilisation des analogues de l'insuline est désormais considérée comme sûre au cours de la grossesse. L'obtention d'un contrôle glycémique strict et une surveillance rapprochée sont recommandées pendant toute la grossesse. La prise en charge obstétricale doit avoir lieu dans une maternité qui dispose d'un environnement néonatal adapté et travaillant en collaboration avec les diabétologues.

Conclusions. – La programmation et une prise en charge adéquate tout au long de la grossesse sont indispensables pour améliorer le pronostic de la grossesse chez les femmes qui ont un DT1.

Mots clés : Grossesse ; Diabète de type 1 ; Recommandations ; Revue

Abbreviations

T1DM	Type 1 diabetes mellitus
SFD	Société francophone du diabète, French-Speaking Diabetes Society
DKA	Diabetic ketoacidosis
PIH	Pregnancy-induced hypertension
CM	Congenital malformations
ACE	Angiotensin-converting enzyme
ARBs	Angiotensin-II receptor blockers and inhibitors
CSII	Continuous subcutaneous infusion of insulin
FHR	Fetal heart rate

Pregnancy in women with type 1 diabetes mellitus (T1DM) is associated with many potential risks for both the mother and child that can, however, be reduced by optimal care implemented before conception and pursued throughout pregnancy. Nevertheless, the goals of the Saint-Vincent declaration [1] — to achieve pregnancy outcomes in women with diabetes that approximate those of non-diabetic women — have yet to be achieved. Thus, the aim of the present report, which was focused on T1DM, was to review the measures currently proposed for reducing these risks.

1. Risks associated with pregnancy in women with type 1 diabetes mellitus

1.1. Influence of the pregnancy on glycemic control

1.1.1. Changes in insulin needs

During the first trimester of pregnancy, insulin needs can decrease by 20% compared with pregestational needs [2], and may be associated by nausea and vomiting. Insulin needs then increase from the second trimester, and often up to weeks 30–34 of gestation, by an average of 50% [3]. A marked increase in the dosage of fast-acting insulin in the morning has often been observed. During the last weeks of gestation, insulin requirements may stabilize or decrease until delivery. All these changes can vary considerably from one woman to another [4].

After delivery, insulin should then return to pregestational levels or even lower in cases of breastfeeding. Women need to be informed of such changes in requirements, and the insulin doses used after delivery should be given to avoid the occurrence of hypoglycaemia. Glycaemic targets also need to be higher postpartum.

1.1.2. Hypoglycaemia

Hypoglycaemic events are commonly seen, particularly during the first trimester of pregnancy. Its occurrence is facilitated by efforts to achieve normoglycaemia, the initial decrease in insulin needs and a history of hypoglycaemia before pregnancy. Recurrent hypoglycaemia induces desensitization and increases the risk of severe hypoglycaemia, which was seen in 40–45% of pregnant women in recent series [5,6]. However, cases of maternal mortality most likely due to severe hypoglycaemia are unusual [7]. Optimal management of diabetes before pregnancy reduces the risk of severe hypoglycaemia (level B) [6]. Although hypoglycaemia is teratogenic in rodents, there are currently no data associating hypoglycaemia, including recurrent and severe cases, with congenital malformations (CM), fetal death or short- and long-term impairment of children's development. Nevertheless, further studies are necessary to confirm that maternal hypoglycaemia is not harmful to the infant [8,9].

However, the definition of hypoglycaemia during pregnancy remains vague. Fasting blood glucose physiologically decreases during gestation [10]: in non-diabetic pregnant women, the mean capillary blood glucose is 75 ± 5 mg/dL (4.2 ± 0.28 mmol/L) whereas, during the third trimester, fasting blood glucose is approximately 55 mg/dL (3.1 mmol/L) [11]. Thresholds for the secretion of counter regulatory hormones are also lower during pregnancy [12]. It is therefore possible that the capillary blood glucose threshold that defines hypoglycaemia should be set at around 60 mg/dL (3.3 mmol/L) in pregnant women with T1DM.

1.1.3. Diabetic ketoacidosis

The frequency of diabetic ketoacidosis (DKA) during pregnancy is 2–3% [13,14]. Pregnancy increases the risk of DKA through metabolic changes that promote ketogenesis and reduce the buffering power of plasma. This also explains why DKA can be observed even at modest levels of hyperglycaemia such as