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[Intervention Review]

Different intensities of glycaemic control for pregnant women with pre-existing diabetes

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ABSTRACT

Background

The optimal glycaemic control target in pregnant women with pre-existing diabetes is unclear, although there is a clear link between high glucose concentrations and adverse birth outcomes.

Objectives

To assess the effects of different intensities of glycaemic control in pregnant women with pre-existing type 1 or type 2 diabetes.

Search methods

We searched the Cochrane Pregnancy and Childbirth Group's Trials Register (30 April 2012).

Selection criteria

We included randomised controlled trials comparing different glycaemic control targets in pregnant women with pre-existing diabetes.

Data collection and analysis

Two review authors assessed trial eligibility and risk of bias, and extracted data.

Main results

We included three trials all in women with type 1 diabetes (223 women and babies), and all with a high risk of bias. Two trials compared very tight (3.33 to 5.0 mmol/L fasting blood glucose (FBG)) with tight-moderate (4.45 to 6.38) glycaemic control targets, with one trial of 22 babies reporting no perinatal deaths or serious perinatal morbidity. In the same trial, there were two birth defects in the very tight and none in the tight-moderate group with no significant differences in caesarean section between groups (risk ratio 0.92, 95% confidence interval (CI) 0.49 to 1.73). In these two trials glycaemic control was not significantly different between the very tight and tight-moderate groups by the third trimester, although one trial of 22 women found significantly less maternal hypoglycaemia in the tight-moderate group.

In a trial of 60 women and babies comparing tight (≤ 5.6 mmol/L FBG); moderate (5.6 to 6.7); and loose (6.7 to 8.9) glycaemic control targets, there were two neonatal deaths in the loose and none in the tight or moderate groups. There were significantly fewer women with pre-eclampsia, fewer caesareans and fewer birthweights greater than 90th centile in the combined tight-moderate compared with the loose group.

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Authors' conclusions

In a very limited body of evidence, few differences in outcomes were seen between very tight and tight-moderate glycaemic control targets in pregnant women with pre-existing type 1 diabetes, including actual glycaemic control achieved. There is evidence of harm (increased pre-eclampsia, caesareans and birthweights greater than 90th centile) for 'loose' control (FBG above 7 mmol/L). Future trials comparing interventions, rather than glycaemic control targets, may be more feasible particularly for pregnant women with type 2 diabetes.

PLAIN LANGUAGE SUMMARY

Very little evidence from randomised trials about optimal blood sugar (glucose) targets for pregnant women with type 1 or type 2 diabetes

Women who have either type 1 or type 2 diabetes before they become pregnant have an increased risk of pregnancy loss, high birthweight babies and perinatal deaths. The metabolic disruptions to the fetus caused by the mother's high blood sugars and insulin resistance can affect the development of organs, and cardiovascular malformations are the most common birth defects in infants born to diabetic mothers. Infants of diabetic mothers may also be at increased risk of developing obesity and type 2 diabetes. Management of diabetes in pregnancy therefore aims for tight control of glucose (glycaemic control) using careful combinations of diet, exercise, insulin or other anti-diabetogenic drugs, clinical visits and monitoring.

We identified only three small trials (in a total of 223 pregnant women with type 1 diabetes) looking at different intensities of glycaemic control.

We found very few differences between very tight and tight to moderate glucose targets in two trials, although there were significantly more cases of low blood sugar (hypoglycaemia) and longer hospital stays for women who had very tight blood sugar control.

A single trial comparing tight, moderate and loose blood glucose targets found few differences between the tight and moderate groups, although significantly more women in the tight control group had hypoglycaemia in the first half of pregnancy. In the loose control group, significantly more women had pre-eclampsia, and there were significantly more caesareans and large babies.

It is clearly difficult for women to achieve glucose targets in isolation, and interventions such as monitoring may be successful in helping women to manage their diabetes.