Gestational diabetes

Worth finding and actively treating

Gestational diabetes affects around 5% of pregnant women, however the value of screening women for gestational diabetes has been hotly debated. On the positive side there has been potential benefits for the baby and, on the negative side, the costs of managing gestational diabetes to the mother. This controversy has largely been settled with the publication of the Australasian Carbohydrate Intolerance Study (ACHOIS). This article reviews the implications of ACHOIS for Australian women and their general practitioners.

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Anna is 35 years of age with no history of major disease and is now 24 weeks pregnant. She operates a private business and has a busy lifestyle. You raised the question of screening for gestational diabetes and she asked why she should be bothered and what good would it do for her baby?

Pregnancy is associated with insulin resistance largely caused by the effects of various placental hormones. The insulin resistance builds in mid-pregnancy and pregnant women without gestational diabetes (GD) increase insulin release to overcome this resistance. For those women unable to increase insulin production enough, blood glucose and other nutrient levels rise. These cross the placenta and stimulate the fetal pancreas causing hyperinsulinaemia (insulin is a growth hormone for most organs except the brain). The baby may be born with a large body, which may cause difficulty negotiating the birth canal. Furthermore, the high fetal metabolic rate promotes a range of metabolic disturbances (*Figure 1*).[1]

The Australasian Carbohydrate Intolerance Study (ACHOIS) showed the benefits of intervention for GD for the baby.[2] In ACHOIS, if a woman had GD (*Table 1*) but was not made aware of it and was given routine care, then her baby had a three-fold risk of major complications compared to treated women. In this group, there was an increased risk of a major complication in one of every 33 pregnancies. Of the babies affected, roughly a quarter died and around a quarter suffered birth injury. In the treatment group there were no neonatal deaths nor any birth injuries (*Table 1*).

Apart from these major problems, a further 3% of the babies given routine care, despite their mother having GD, had shoulder dystocia (abnormal labour caused by impaction of the shoulders in the birth canal). This risk was more than halved in women treated for GD.

Of the babies of mothers who were treated compared to those not treated, 10% more were admitted to the neonatal nursery. However, their length of stay was no longer, nor was there any difference in the complication rate for the baby. The significance of this finding is difficult to interpret as criteria for admission to the neonatal nursery were not standardised in ACHOIS.

The ACHOIS findings so far suggest that most of the complications related to GD are in terms of survival and passage through the birth canal. Once delivered, the health of the baby was comparable whether GD was treated or not. ACHOIS also showed that diagnosing and treating GD did improve the health outcomes for the babies, although it didn't prevent all the complications. Follow up studies will assess longer term effects.

You've explained the benefits to the baby but Anna says that she's low risk. She has no family history of diabetes, she's young and likes being 'lean and mean'. Surely she doesn't need to be tested.

The Australasian Diabetes In Pregnancy Society (ADIPS) has developed guidelines for the diagnosis and management of GD[3,4] (*Figure 2*). These guidelines have been accepted by The Royal Australian College of General Practitioners and recommend a screening test

at 26–28 weeks for all pregnant women.[5] Although there are populations with higher risk, particularly Indigenous Australians, Asian, Maori, mediterranean, and Middle Eastern women, selective screening has been found to miss cases as well as being less cost effective. Women with risk factors such as glycosuria, age more than 30 years, family history of diabetes, previous GD or glucose intolerance, previous adverse pregnancy outcome, or high risk ethnicity, may be tested for GD earlier by oral glucose tolerance test (OGTT) and, if negative, re-tested at 26–28 weeks gestation.

The screen and confirmatory tests are positive. Now Anna is worried that she will not be able to manage her pregnancy, her GD and her business. She asks if and when she will have to stop working.

The ACHOIS protocol promoted a multidisciplinary approach to the management of GD. This did involve more antenatal visits and more interventions during labour (by about one-third) but did not increase the rate of caesarean section.

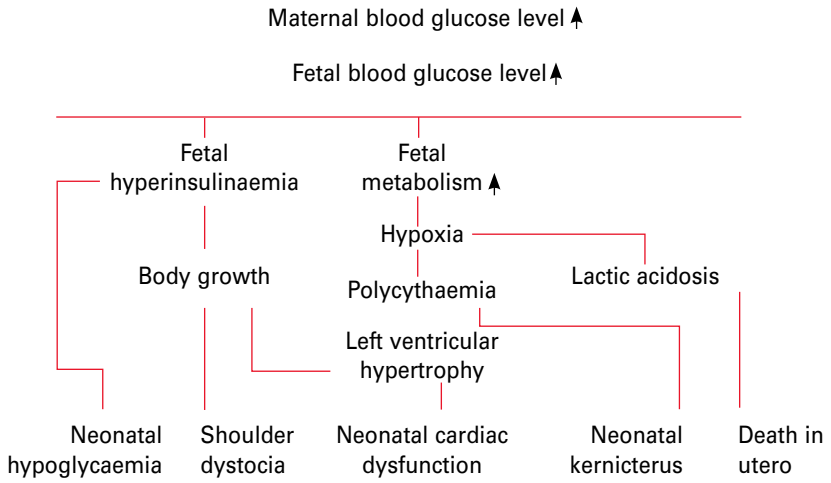

Figure 1. Fetal effects of gestational diabetes

Table 1. ACHOIS design and outcomes

	1000 pregnant women 24–36 weeks gestation	
	Gestational diabetes*	
Primary outcome	**Intervention 490**	**Usual care 510**
Induction	39%	29%
	RR: 1.34 (1.15–1.52)	
	Number needed to treat 10	
Infants	506	524
Adverse outcome#	1%	4%
	RR: 0.25 (0.14–0.75)	
	Number needed to treat 33	
Neonatal nursery	71%	61%
	RR: 1.16 (1.03–1.23)	
	Number needed to treat 10	

Caesarean section, jaundice requiring phototherapy: not significant differences between the groups

* OGTT[10] (mmol/L): fasting <7.8; 2 hour 7.8–11.0

\# Perinatal death, bone fracture, nerve palsy and/or shoulder dystocia

These issues will be further assessed in future trials, however for the time being, the ADIPS recommends that all women should be screened and, if diagnosed, actively managed. ADIPS does not indicate when a woman should stop working, however Anna should be made aware of both the extra self and medical care she will need for the remainder of her pregnancy so that she can plan future work commitments.

Anna is now 32 weeks gestation and finding it all a bit of a strain. She recently had to start taking insulin and is feeling stressed. Her mother had postpartum depression and she's worried that this might happen to her.

The ACHOIS assessed the women's emotional state and their perception of their health. The active management of GD did not increase women's anxiety but, perhaps surprisingly, reduced the rates of depression postpartum. The reasons for the reduction in postpartum depression are not known, but it is clear that treatment of GD does not seem to have adverse effects on mental health. Furthermore, women's perception of their health as measured by the SF-36 was also better if their GD was treated (*Figure 3*).

All went well. Anna went full term, was monitored carefully, and had a normal vaginal delivery. Her daughter Sarah, was 3.7 kg, had an Apgar score of 8, and has thrived. Anna now wants to know about the future for both her and Sarah.

The future for Anna

Although the hyperglycaemia disappeared within hours of delivery, Anna's predisposition to diabetes remains. Another pregnancy would likely be associated with another episode of GD, which might require more active measures to control glycaemia than during the first episode. With time, the increasing insulin resistance and decreasing insulin capacity are likely to produce prediabetes (impaired fasting glucose or impaired glucose tolerance) and

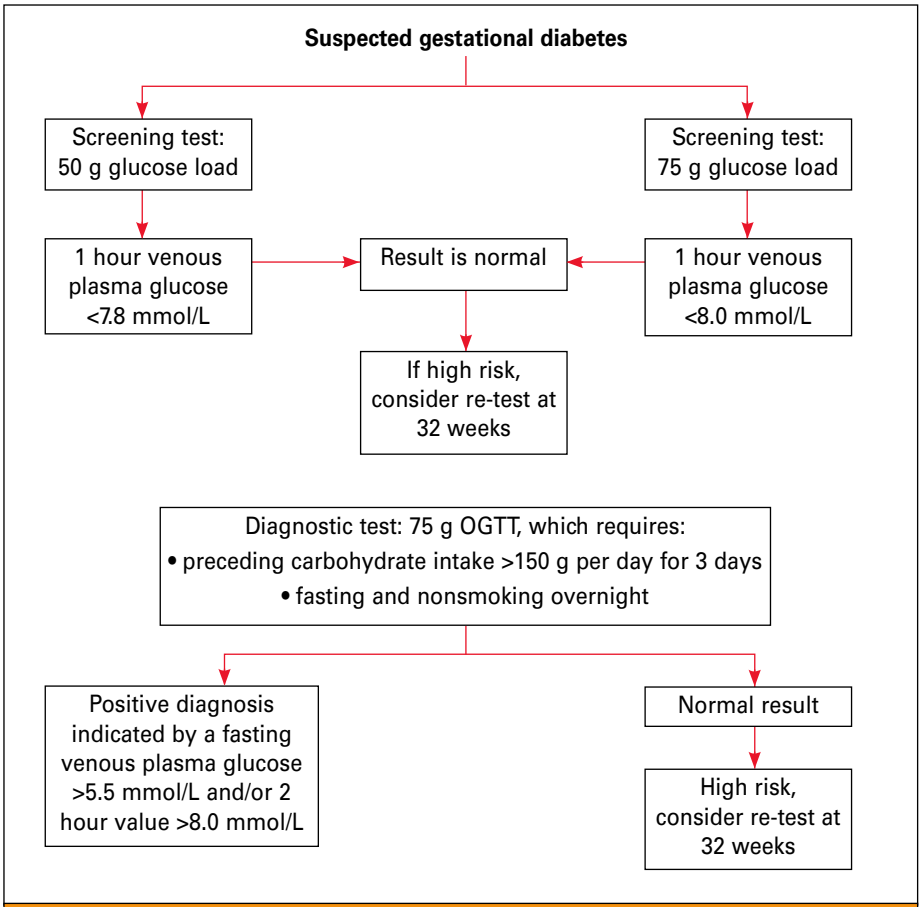

Figure 2. Screening for and diagnosis of gestational diabetes (26–28 weeks)

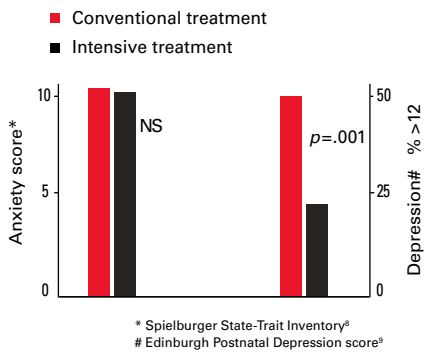

Figure 3. ACHOIS mental health (3 months postpartum)

then diabetes. In some ethnic groups, type 2 diabetes after GD is very common (eg. 62% in women from Trinidad over the ensuing 3.6–6.5 years).[6]

Recommended follow up for Anna is in three stages:

- 6–8 weeks postpartum: an OGTT to exclude persistent abnormal glucose tolerance (prediabetes or diabetes)
- before stopping contraception (if she plans further children after Sarah): Anna should be tested to exclude existing diabetes where hyperglycaemia could effect a future baby's development and viability, and
- at least every 2 years: Anna should have an OGTT.[3]

Anna can be advised that a healthy lifestyle can delay or prevent the onset of type 2 diabetes. In the Diabetes Prevention Program[7] for example, 30% of women with IGT developed diabetes over 3 years compared with 10% of those pursuing an intensive healthy lifestyle program.

The future for Sarah

Sarah has half Anna's genes and is therefore predisposed to future metabolic problems. There is also evidence that the intrauterine environment can affect predisposition to metabolic syndrome. For example, women with diabetes have babies who are much more predisposed to metabolic syndrome than women who have the genes for diabetes, evidenced by later development of diabetes, but who don't have diabetes during their pregnancy. Sarah may have a 'double whammy' of 'genes and glycaemia' predisposing her to develop metabolic syndrome.

Anna's adoption of a healthy lifestyle would therefore benefit Sarah (and any other offspring) as well as Anna.

The future of ACHOIS

The cohort of women and their offspring are being followed up to assess the effects of active intervention on the longer term outcome for both mother and baby. Ongoing ACHOIS longitudinal studies should provide prospective data on factors such as intrauterine environment on the long term development and health of the offspring.

Conflict of interest: none declared.

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