



A medical audit of practice management of diabetes in pregnancy at Gisborne Maternity Hospital's Obstetric Medical Service 2009–2011 (part 2)

Introduction—Diabetes mellitus is an increasingly prevalent condition in New Zealand (as in the rest of the world). Women on the East Coast of New Zealand's North Island are at high risk of developing gestational diabetes (GDM) especially because of elevated BMI and a past history of GDM.

The current recommendations for GDM at our hospital are that all patients are screened for diabetes between 24 and 28 weeks, some earlier depending on risk factors that are present. The aim is to identify potential foetal and maternal morbidity (hypertension, PET, Caesarean section rates, future diabetes, perinatal mortality/morbidity). The diagnosis of diabetes is made on the usual criteria which includes a blood glucose challenge (1 hour) with levels of >7.8 mmol/L, a 75 gm glucose tolerance test with fasting hyperglycaemia and a 2-hour postprandial level of >9 mmol/L.²

Table 1. Audit of diabetes mellitus in pregnancy at Gisborne Hospital

Variables	2000–2004	2009–2010
Total number of pregnancies:	1505 (752 pa)	2832 (705 pa)
Gisborne Census 2006 pop	44496	45900
Percentage Māori (M)	44%	42%
Number of diabetics and prevalence	50 (3.3%) M 64%	59 (2.08%) M 58%
Maternal gestation at first visit:	29 women >30 weeks	20 women >30 weeks
Maternal age	42 women >30 years	23 >30 years
Age range in years: ,	range 19-43 years	range 8-41 yrs; mean 28 and average 29
Family history of diabetes	?	23 (46%)
Previous GDM	33 women (56%)	26 women (52%)
BMI kg/m ²	34 >30 (58%) 6 >40 (10%)	35 >30 (70%) M 7 11 >40 (22%) M 5
Type of diabetes mellitus	7 type 1 and 13 type 2	3 type 1 and 4 type 2
Hypertension	6 women (10%)	5 women (10%)
Treated with insulin in pregnancy	19 (32%)	13 (26%)
Treated with metformin	?	2
Compliance with treatment	poor in 5 (10%)	poor in 6 (10%)
Cigarette smoker	31 (52%) 65% Māori	13 (26%) all Māori
Pregnancy outcome C/section	28 (47%)	21 (42%) total 16 emergency
Baby birth weight >4.0Kg	23 (38%)	7 (14%)
Postnatal follow-up GTT	None in 70%	None in 60%

The obstetric medical service at Gisborne Hospital consists of a Specialist Obstetrician, two Specialist Diabetic Nurses, the hospital Dietician, the Midwife Clinic Co-ordinator and a Specialist Physician. Patients are seen monthly at the clinic for assessment of weight, blood pressure, urine analysis and BM levels.

Weight loss is encouraged before rather than during pregnancy. If haemoglobin A1c is elevated prior to the appointment, the test is monitored more frequently—at least 4 to 6 weekly. Pregnancy outcome measures included finding of macrosomia, Caesarean section rate and foetal complication rate (see Table 1).

All patients were given notice of a postnatal follow-up glucose tolerance test (or at least a HbA1c with or without a fasting hyperglycaemia) at 6 weeks. If this is negative, the test is done again in 2 or 3 years time. Special note was taken of the presence of acanthosis nigricans (see Table 2).

Table 2. Presence of acanthosis nigricans

Total number		13 women (26%) (M 11 and PI 2)
Age	>30 years	8 women
	>40 years	5 women
Baby birth weight	2.79–3.9 kg	11 women
	>3.9 kg	2 women
5 women had previous GDM and one had PCOD		
5 women were on insulin during pregnancy		
5 had Caesarian section, 4 were emergencies		

Discussion—In the US, more than 23.6 million adults have diabetes (7.8%) and 57 million adults have pre-diabetes (blood sugars are higher than normal but not elevated enough to be diagnosed as diabetic). Pre-diabetes also raises the risk of Type II diabetes and heart disease (CDC Press Release Jan 2011). The US prevalence of GDM has gradually increased since 1989 from 1.9 to 4.2%.¹ The incidence of GDM in South Auckland for women of European decent is 3% and this rises to 7.9% among Māori women and 8.1% among Pacific Island women.²

In comparison, the current overall incidence of diabetes in pregnancy in Gisborne, given the ethnicity and high rates of obesity, remains still rather low at 3.3%. However, we can verify that nearly all the patients have had either a polyose challenge or a glucose tolerance test or both from results available at the hospital laboratory. The present cohort comprised 32 Māori women (M), 2 of Pacific Island origin (PI), one Chinese and 15 of European descent (E).

The aim of screening for GDM is to reduce maternal and foetal morbidity associated with increasing levels of maternal hyperglycaemia. Recurrence rate of GDM is estimated at 35–52% in subsequent pregnancies and as many as 20% of women with GDM will have an impaired glucose tolerance test during the early postpartum period and go on to develop type 2 diabetes.¹ Women with GDM have a higher risk of cardiovascular disease at a younger age. It is reported that the strongest independent

risk factors for GDM were a positive past history of GDM and a maternal age of more than 40 years.³

The presence of diabetes in pregnancy increases the risk of the baby developing obesity (and subsequent diabetes) by threefold and this can occur 6 to 7 years after delivery.⁴ In this regard, postnatal follow up (with GTT) will allow early recognition of diabetes and help guide a more aggressive approach to dietary modification (food low in high GI content and fast-foods, fizzy/pop drinks) promoting weight loss combined with exercise, which may prove valuable to both the young mother and a her child. Pre-conceptual guidance and counselling is also provided and midwives are encouraged to refer patients at risk much earlier in the gestational period.

Conclusions—The prevalence of diabetes in pregnancy in the Gisborne district remains surprisingly low at 3.3%.⁷ Patients with GDM are still being referred late in gestation despite high risk. There appears to be a high incidence of acanthosis nigricans (AN) which is associated with obesity, the metabolic syndrome and Insulin resistance. Though weight and maternal age are known risk factors, it would appear that patients with a previous history of GDM also have a high risk of developing type 2 diabetes.

Caesarian sections rates remain fairly high at 42% when 2009 NZ statistics show a rate of 25.1% and half were emergencies. Postnatal follow-up with GTT remains very disappointing. This greatly reduces the opportunity for early diagnosis, access to prenatal care and to help arrest the progression of morbidity, especially diabetes-associated disease in this group of young women. *On the positive side*, fewer pregnant women were smokers no doubt helped and encouraged by current public health measures. Prevalence of foetal macrosomia has also declined (in this small group) reflecting better glycaemic control.

The presence of acanthosis nigricans appears to be a valuable clinical sign in determining high risk. This is a skin disorder characterised by thickened hyperpigmented velvety plaques in the body flexures and neck and is more commonly associated with obesity and insulin resistance including Type II diabetes, the metabolic syndrome, polycystic ovarian disease and hypertension. The condition is 25% more common in African-Americans and can be regarded as a clinical surrogate of hyperinsulinism.^{5,6}

The metabolic syndrome present in some 34% of American adults increases the risk of the development of diabetes three to fivefold in 5 years. The baby born of a mother with GDM at term will have a risk of becoming an obese child at the age of 6 to 7 years.³

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