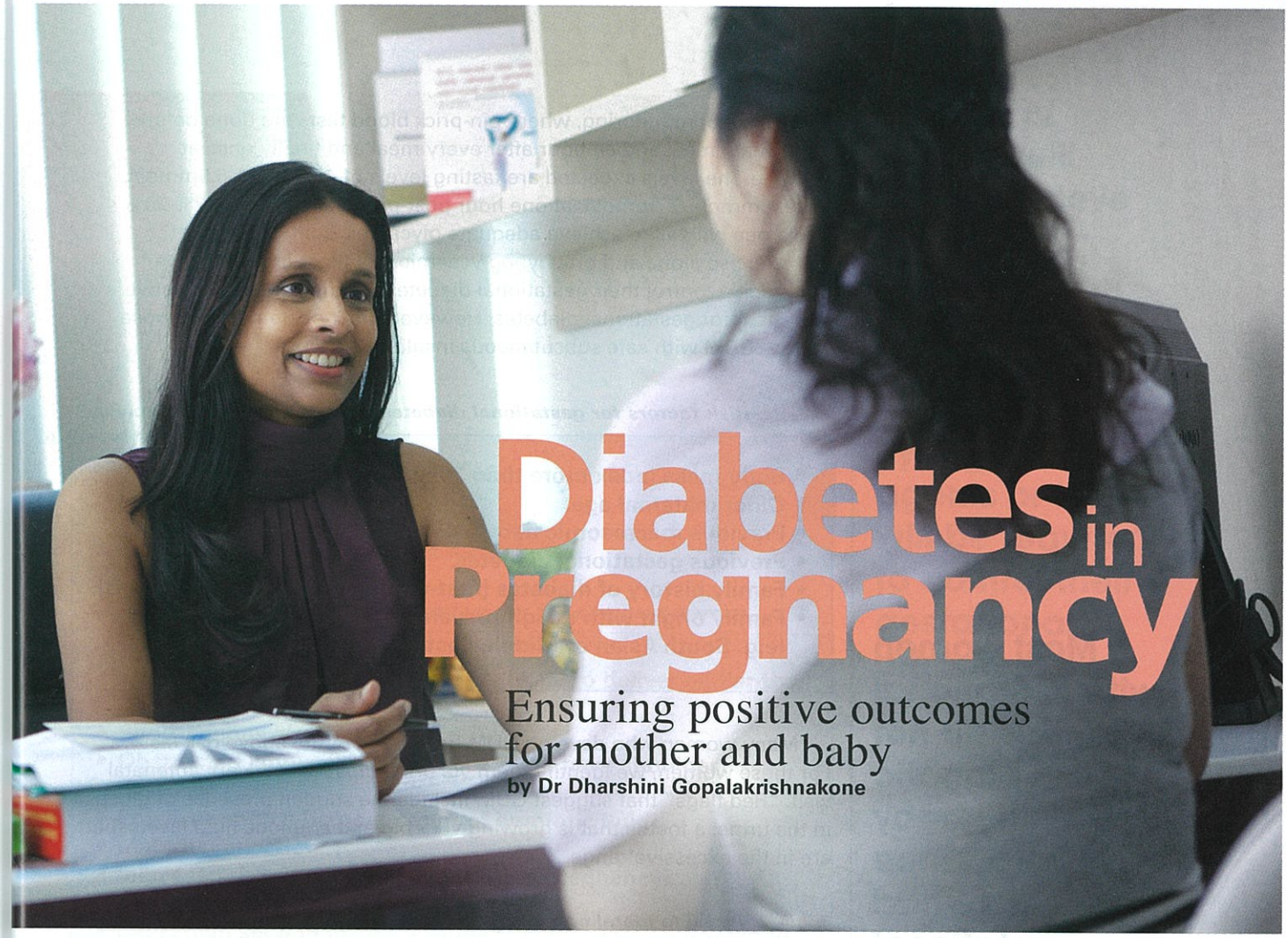

Diabetes in Pregnancy

Ensuring positive outcomes for mother and baby

by Dr Dharshini Gopalakrishnakone

Diabetes mellitus (DM) is considered the most common pre-existing medical disorder complicating pregnancy. Type 1, type 2 and gestational diabetes affect 2%-5% of pregnancies. Gestational diabetes is the form of diabetes that is first discovered in a pregnant woman at around 28 weeks of gestation. Once diagnosed, the focus should be on relaying adequate and succinct information, advice and support to help reduce the risks of adverse pregnancy outcomes for the mother and the baby.

Pre-existing Diabetes Mellitus

In women with pre-existing diabetes, a thorough review should be conducted before becoming pregnant, including glycaemic targets, glucose monitoring, medication and screening for complications. Pre-conception care and good glucose control before and during pregnancy can reduce the risks of DM.

If it is safely achievable, women with diabetes who are planning to become pregnant should aim to maintain their HbA1c below 6.1%. Women should be reassured that any reduction in HbA1c towards the target of 6.1% is likely to reduce the risk of congenital malformations.

Women with pre-existing poorly controlled DM should delay pregnancy because of the risk of progression of microvascular complications including retinopathy and nephropathy. Poor glycaemic control in the first trimester is associated with the progression of retinopathy. Worsening nephropathy can affect maternal blood pressure, and nephropathy with superimposed pre-eclampsia is the most common cause of preterm delivery in women with diabetes.

Pregnancy causes a physiological reduction in insulin action. This means that women with diabetes have an increased requirement for insulin during pregnancy.

Gestational Diabetes Mellitus (GDM)

GDM is usually diagnosed at around 28 weeks of gestation using the OGTT (Oral Glucose Tolerance Test). Lifestyle advice including dietary modification is the primary intervention in all women diagnosed with gestational diabetes. The hypocounts are then monitored using 7-Point BSP (blood

sugar profile) monitoring, where pin-prick blood tests are done before every main meal and an hour after every meal and finally once at bedtime. The levels expected are fasting levels of 4.4mmol/L-5.5mmol/L and 6.6mmol/L-7.7mmol/L at one hour post-prandial. However, 7%-20% of women will fail to achieve adequate glycaemic control with diet and exercise alone and oral hypoglycaemic agents or insulin will be required to control their gestational diabetes. Metformin is an effective treatment for gestational diabetes. However, most obstetricians choose to treat GDM with safe subcutaneous insulin injections.

Table 1. ***Risk factors for gestational diabetes (who to screen in pregnancy)***

- **Body mass index more than 30kg/m^2.**
- **Older maternal age.**
- **Previous macrosomic baby weighing 4.5kg or more.**
- **Previous gestational diabetes.**
- **Family history of diabetes (first-degree relative with diabetes).**
- **Family origin with a high prevalence of diabetes (e.g. South Asian or Middle Eastern).**

Many women who develop GDM have none of the above risk factors. For these women, we identify them via urine dipsticks at every antenatal visit. "Red flags" that suggest GDM include the sudden presence of glucose in the urine, a foetus that is growing very big and amniotic fluid levels that are in the excessive range.

Table 2. ***Possible foetal complications***

- **Maternal diabetes increases the risk of overweight and obesity in offspring in later life, and it would appear that this effect acts via intrauterine programming.**
- **Congenital malformations: neurological and cardiac abnormalities are particularly common.**
- **Foetal macrosomia (large babies) and its associated complications.**
- **Birth injury (usually due to delivery of a large baby). Babies of women with diabetes were 10 times more likely to have Erb's palsy.**
- **Foetal distress during labour.**
- **Hypoglycaemia and postnatal adaptation complications.**
- **Respiratory distress syndrome.**
- **Jaundice.**
- **Late intrauterine death/stillbirth (five-fold increase).**
- **Increased perinatal mortality (three-fold increase within first month of life).**

The Australian Carbohydrate Intolerance Study in Pregnant Women (ACHOIS) established that treatment of gestational diabetes with insulin improved pregnancy outcomes. Birth weight, macrosomia and birth weight > 90th percentile were all significantly reduced.

Most women with gestational diabetes do not remain diabetic after the baby is born. Once they have had gestational diabetes, they are at higher risk for getting it again during a future pregnancy and for developing diabetes later in life. Hence, the physician must remind the patient to repeat her OGTT test once she turns 40 years of age or if she shows symptoms of DM in the future.

7%-20% of women will fail to achieve adequate glycaemic control with diet and exercise alone and oral hypoglycaemic agents or insulin will be required to control their gestational diabetes.

Table 3. ***Potential obstetric complications for the pregnant woman***

- **Premature labour (five times more likely to deliver earlier than 37 weeks gestation).**
- **Spontaneous abortion.**
- **Obstructed labour (8% of babies would have shoulder dystocia).**
- **Polyhydramnios (large amount of amniotic fluid).**
- **Maternal infection.**
- **Increased risk of hypertension (during pregnancy).**
- **Thromboembolism.**
- **Caesarean section (67% Caesarean section rate compared to 22% in the general maternity population).**

Furthermore, the primary composite outcomes (serious perinatal outcomes – death, shoulder dystocia, bone fracture and nerve palsy) were significantly reduced from 4% to 1%.

Delivery Plans

Pregnant women with diabetes who have a normally grown foetus should be offered elective birth through induction of labour, or by elective Caesarean section if indicated, after 38 completed weeks. Women with diabetes should be advised to give birth in hospitals where advanced neonatal resuscitation skills are available 24 hours a day.

Post-delivery Advice

Women who were diagnosed with gestational diabetes should be offered lifestyle advice (including weight control, diet and exercise) and offered a fasting plasma glucose measurement (but not an OGTT) at the six-week postnatal check and annually thereafter. Most women with gestational diabetes do not remain diabetic after the baby is born. Once they have had gestational diabetes, they are at higher risk for getting it again during a future pregnancy and for developing diabetes later in life. Hence, the physician must remind the patient to repeat her OGTT test once she turns 40 years of age or if she shows symptoms of DM in the future. MG

References:

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3 Confidential Enquiry into Maternal and Child Health (CEMACH).

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