Management and prevention of type 2 diabetes

DIABETIC MEDICINE

Insulin should replace OGLA during pregnancy

Readability	✓✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓✓

1 This study was undertaken to examine the use of oral glucose-lowering agents (OGLA) and their safety in pregnant women with type 2 diabetes in South Africa. The OGLAs used were metformin and glibenclamide.

2 For the period 1991 to 2000 the authors conducted a retrospective analysis of maternal and perinatal outcomes of 379 women with type 2 diabetes.

3 The 379 pregnant women were divided into three groups according to the therapy they were receiving to hit a target fasting blood glucose level of <5.5 mmol/l: OGLA alone; converted from OGLA to insulin; insulin alone or converted from diet alone to insulin without any OGLA.

4 All therapies were stopped at 24 hours before the elective delivery time and glucose infusion was begun.

5 The mean HbA_{1c} was similar in all groups at the start and throughout the pregnancy.

6 In all groups, fetal anomaly rates were comparable: 5.7% for OGLA alone, 2.0% in the converted from OGLA to insulin group and 0% in the insulin alone or converted from diet alone to insulin group; $P=0.2$.

7 Perinatal mortality rates (per 1000 births) were: 125, 28, 33, respectively for each group, these were significant($P=0.003$).

8 Conversion from OGLA to insulin was protective for perinatal mortality compared with OGLA alone treatment ($P=0.024$).

9 The authors conclude that OGLAs are not teratogenic but that it is advisable to replace OGLA, in particular glibenclamide, with insulin when women attend for pregnancy care.

Ekpebegh CO, Coetzee EJ, van der Merwe L, Levitt NS (2007) *Diabetic Medicine* **24**: 253–8

Insulin - the treatment of choice for pregnant women with type 2 diabetes?

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This paper (summarised to the left) is a useful, pragmatic paper with key take-home messages for clinicians providing care for women with type 2 diabetes in pregnancy. This is an increasingly common problem and an increasingly complex field, but fortunately the applied messages from this paper are readily received and simple and straightforward to put into practice – at least in the developed world.

It is clear that insulin is still the optimal treatment option for women with type 2 diabetes in pregnancy. Oral hypoglycaemic agents (well glibenclamide and metformin at least) are not teratogenic but replacing oral agents with insulin as soon as possible is probably wise and likely to contribute to a significant reduction in perinatal mortality. In practical terms this probably means continuing the oral agents but arranging swift assessment at a specialist combined diabetes pregnancy clinic for consideration of insulin as soon as pregnancy is confirmed, or in the pre-pregnancy planning clinic if at all possible. Stopping the oral agents before initiating insulin is inappropriate and will lead to an inevitable deterioration in glycaemic control, so continuing the oral agents and arranging early assessment or transfer to insulin seems the best option.

Optimal glycaemic control in the immediately prenatal period (as evidenced by last HbA_{1c}) proved a significant contributor to good outcome and this ambient glycaemia reflected in lower glycaemic control is more easily achieved with insulin because of the potential for more rapid and finely-tuned insulin adjustments. These regular dose escalations are more difficult to achieve with oral agents.

This is a difficult and possibly unwelcome message for the South African authors of this paper as type 2 diabetes is increasingly common in the emerging economies where a ready supply of insulin may not be accessible to all who need it. The pressure to move from animal to conventional human and now analogue insulins may further heighten this challenge. It beholds us all to work towards ensuring a readily available supply of economic insulin for all. While we recognise the gold standard of early intensive insulin therapy for diabetes in pregnancy, we must be mindful of the improvements in outcome that can be achieved with oral agents and with oral agents in addition to insulin.

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In a parallel study of Australian women with gestational diabetes mellitus (Lee et al, page 160), requirement for insulin in pregnancy was strongly predictive of subsequent development of type 2 diabetes. It seems the more compromised the beta-cell function, the more necessary insulin therapy and thus the more insulin deficient the underlying diabetes phenotype and thus the more necessary insulin in pregnancy. Women need to know that coming off insulin in both settings may be a short-lived phenomenon.

'It is possible to clearly identify factors that predict the later onset of type 2 diabetes following pregnancy and that women with gestational diabetes should be followed up over the long-term as they will be at increased CV risk.'

'Physicians should clarify with people their perceptions of risks of complications and explain that some oral hypoglycaemic agents may not cause a vicious cycle of ever-increasing doses.'

JOURNAL OF THE AMERICAN SOCIETY OF NEPHROLOGY

Dual strategies needed for reducing BP and albuminuria

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓✓✓

1 This study used the RENAAL trial data to investigate the extent of discordance in treatment effects on systolic BP (SBP) and albuminuria and its association with renal outcome.

2 The authors looked at the data of 1428 individuals with hypertension and diabetic nephropathy.

3 The authors saw that there was a lack of albuminuria in 37% of those with a reduced SBP; and this was associated with poorer outcomes.

4 The authors conclude that changes in albuminuria do not necessarily parallel BP reductionare not similar in a substantial proportion of patients. They suggest that a dual strategy should be adopted with a combined approach of BP lowering and a reduction of albuminuria excretion.

Eijkelkamp WB et al (2007) *Journal of the American Society of Nephrology* **18**: 1540–6

DIABETES CARE

First-degree relatives are at risk of loss of ß-cell function

Readability	✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓✓

1 The authors of this study looked at the risk of developing hyperglycaemia in first-degree relatives of people with type 2 diabetes.

2 The study involved 33 individuals without diabetes who were related to people with type 2 diabetes. Over 7 years the authors examined the evolution of insulin sensitivity, ß-cell function, glucose effectiveness, and glucose tolerance.

3 Over the period of the study the individuals gained weight, their waist circumference increased significantly ($P<0.05$), however insulin sensitivity and glucose effectiveness did not.

4 ß-cell function was seen to decrease significantly by 22% ($P<0.05$). There were also significant decreases in glucose tolerance.

5 The authors suggest that early intervention to slow ß-cell decline should be considered in this high-risk group.

Cnop M, Vidal J, Hull RL et al (2007) Progressive loss of beta-cell function leads to worsening glucose tolerance in first-degree relatives of subjects with type 2 diabetes. *Diabetes Care* **30**: 677–82

BRITISH JOURNAL OF GENERAL PRACTICE

Perceived severity affects adherence

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓

1 The authors of this Taiwanese study set out to obtain an insight into the perceptions of people with diabetes, with particular reference to the course of the condition and its severity, and to see how it impacted on their self-care.

2 This insight was gained by conducting 22 individual and 7 group interviews. All those interviewed had a duration of type 2 diabetes of more than 1 year.

3 The authors found that people regarded diabetes as an incurable, inevitably deteriorating disorder of sugar metabolism with many chronic complications. Individuals felt that the condition followed a unidimensional course with ever-increasing medication being a side effect of the drugs they were taking.

4 They conclude that physicians should clarify with people their perceptions of risks of complications and explain that some oral hypoglycaemic agents may not cause a vicious cycle of ever-increasing doses.

Lai WA, Chie WC, Lew-Ting CY (2007) How diabetic patients' ideas of illness course affect non-adherent behaviour: a qualitative study. *British Journal of General Practice* **57**: 296–302

DIABETES CARE

Women with a history of gestational diabetes require follow-up to ameliorate CV risk

Readability	✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

1 The authors of this study set out to determine the long-term risk of developing type 2 diabetes following a pregnancy complicated by gestational diabetes and assess which factors are predictive of later development of type 2 diabetes in this group.

2 This was a retrospective cohort study which involved 5470 women with gestational diabetes and 783 controls who presented between 1971 and 2003 for postnatal follow-up at the Mercy Hospital for Women in Melbourne, Australia.

3 It was found that the risk of developing diabetes increased with the time of follow-up for both groups, however at any point it was 9.6 times greater for women with gestational diabetes.

4 The authors noted that predictive factors for the development of type 2 diabetes in those with gestational diabetes were: use of insulin ($P<0.001$) and 1-hour blood glucose following OGTT ($P<0.001$) for each increase of 1 mmol above 10.1 mmol the rate of diabetes developed increased by 1.3 times. Neither fasting nor 2-hour blood glucose were found to be independent predictors.

5 While BMI was associated with an increased risk of developing type 2 diabetes after 5–7 years, it was not considered an independent predictor following gestational diabetes.

6 The authors conclude that it is possible to clearly identify factors that predict the later onset of type 2 diabetes following pregnancy and that women with gestational diabetes should be followed up over the long-term as they will be at increased CV risk.

Lee AJ et al (2007) Gestational diabetes mellitus: clinical predictors and long-term risk of developing type 2 diabetes: a retrospective cohort study using survival analysis. *Diabetes Care* **30**: 878–83

AGE AND AGEING

Type 2 diabetes is associated with impaired cognitive function

Readability	✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

1 In this investigation, the authors set out to describe a detailed neuropsychological profile in people with type 2 diabetes. They also looked at the correlations between cognitive impairment and brain lesions by using magnetic resonance imaging (MRI).

2 The authors recruited 92 individuals with type 2 diabetes with a mean age of 73.2 ± 5.7 years and a mean diabetes duration of 13.8 ± 10.8 years. They also enrolled 44 without diabetes to act as controls (mean age 72.9 ± 5.3 years).

3 The exclusion criteria for this study were: a history of psychiatric or nervous disorders that could influence cognitive function, dementia, a history of alcohol or substance abuse or cerebrovascular accidents.

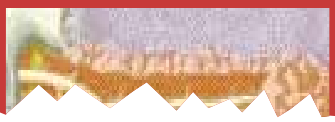
4 All participants underwent an extensive battery of neuropsychological tests and had an MRI scan of the brain.

5 The investigators found that neuropsychological scores were worse for each cognitive domain except for memory functions after adjustment for hypertension and that HbA_{1c} and duration of diabetes were significantly associated with cognitive dysfunction.

6 They conclude that type 2 diabetes is associated with a decline in cognitive function, however it does not seem to affect the memory, and the authors suggest that cognitive function should be assessed as part of the routine review of people with type 2 diabetes.

van Harten B, Oosterman J, Muslimovic D et al (2007) Cognitive impairment and MRI correlates in the elderly patients with type 2 diabetes mellitus. *Age and Ageing* **36**: 167–70

DIABETES, OBESITY AND METABOLISM



Weight gain in diabetes may not be due to an increased energy intake

Readability	✓✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

1 In this US study the authors attempt to clarify the causes of weight gain that are associated with the use of insulin and combination therapy.

2 This open-label, prospective investigation ran for 6 months and randomised individuals to insulin monotherapy, insulin plus pioglitazone, or insulin plus metformin.

3 Individuals were recruited for the study with the following inclusion criteria: at least 18 years of age; HbA_{1c} ≥ 7.5 %; receiving insulin, oral agents or no pharmacotherapy; and willing to undergo intensive treatment to improve their glycaemic control.

4 Weight, resting energy expenditure (REE), reported energy intake and total energy expenditure, HbA_{1c}, glycosuria, plasma leptin, ghrelin and adiponectin levels, and body fat percentage were measured.

5 There were 49 participants who completed the study, baseline characteristics were as follows: Weight was 89.4 ± 22.9 kg and HbA_{1c} was 11.1 ± 1.5 %.

6 Weight increased by over 7 kg in each of the study arms and HbA_{1c} decreased to 7.8 ± 0.9 % in the monotherapy arm, 7.6 ± 1.0 % in the metformin arm and 7.2 ± 1.2 % in the pioglitazone arm.

7 REE and reported energy intake decreased in all groups. The authors conclude that weight gain is probably not due to increased food intake, but perhaps to increased efficiency in fuel usage owing to better glycaemic control.

Jacob AN, Salinas K, Adams-Huet B, Raskin P (2007) Weight gain in type 2 diabetes mellitus. *Diabetes, Obesity & Metabolism* **9**: 386–93