Potential new models of care for the management of diet-controlled gestational diabetes: preliminary analysis of compliance, costs-of-care & health outcomes

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BACKGROUND

The annual incidence of gestational diabetes mellitus (GDM) in Australia has markedly increased following a 2014 consensus statement by the Australian Diabetes in Pregnancy Society (ADIPS) endorsing new diagnostic criteria recommended by the International Association of Diabetes and Pregnancy Study Groups (IADPSG).[1,2] These proposed thresholds were derived from data obtained from the Hyperglycaemia and Adverse Pregnancy Outcome (HAPO) study, which evaluated the degree of maternal hyperglycaemia associated with perinatal complications.[3] Concerns regarding the new diagnostic approach have been raised primarily around the resulting impact on costs of care in the management of an increased number of GDM pregnancies.[4,5] Consequently, there have been calls to develop more cost-effective treatment strategies. Studies have hypothesised that the resulting increase in incidence reflects a cohort of women at the milder end of the spectrum of GDM now being diagnosed.[6] Therefore, there may be value in stratifying patients into different management pathways according to their risk of adverse perinatal outcomes. Women maintaining adequate glucose control with dietary measures alone represent a lower risk subset of GDM patients for whom a more economical alternative to existing management strategies may be suitable, thereby addressing anticipated and realised resource constraints.[7-9]

AIMS & OBJECTIVES

To assess compliance to a lower risk care pathway for GDM-diet and identify effects on perinatal outcomes and costs of care from implementing this strategy.

METHODS

Design: Quasi-experimental study assessing anticipated and realised costs of care for GDM-diet and GDM-insulin cohorts and comparing perinatal outcomes of GDM-diet pregnancies with those of matched non-GDM controls.

Participants: All GDM patients with singleton pregnancies giving birth in the hospital, excluding those with pre-existing diabetes, early GDM diagnosis prior to 19 weeks and exclusive management by maternal fetal medicine (MFM).

Main outcome measures: Primary perinatal outcomes were hypertensive disorder of pregnancy, caesarean section, birth weight >90th percentile and preterm birth less than 37 weeks. A number of secondary health outcomes were also analysed. Compliance was assessed solely with respect to ultrasound recommendations of the management protocol.

Proposed generic lower-risk model of care:

- Midwife appointments at 30, 32, 34, 36, 38 & 40 weeks' gestation.
- No growth ultrasounds, Pregnancy Day Care Centre (PDCC) admissions, obstetrician antenatal reviews or diabetes educator telephone consultations.

RESULTS

1. COMPLIANCE

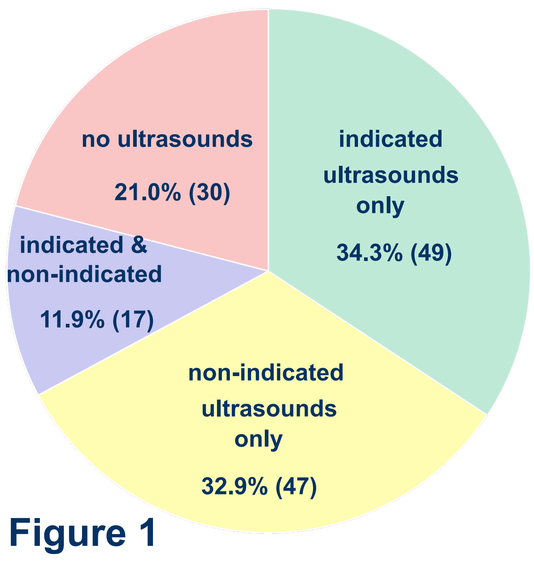

Figure 1
Proportion of GDM-diet patients receiving growth ultrasounds

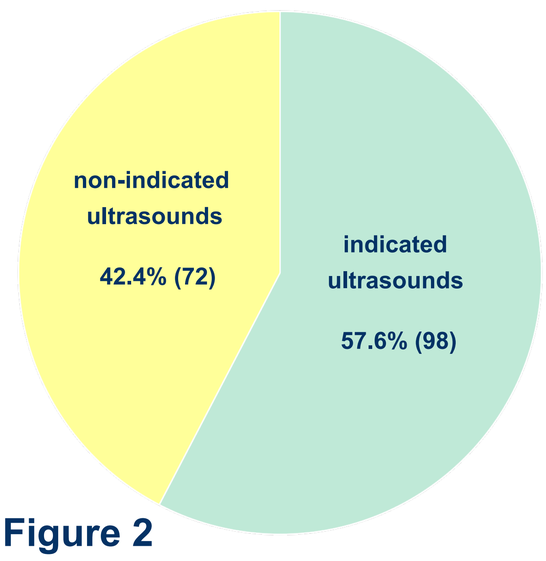

Figure 2
Proportion of growth ultrasounds performed for non-GDM indication

2. ECONOMIC ANALYSIS

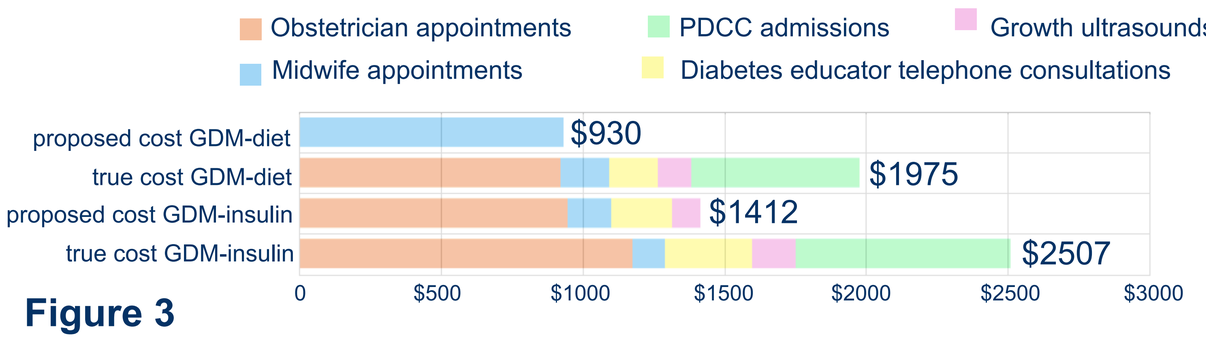

Figure 3
Average costs of medical care for GDM

3. PERINATAL OUTCOMES

Table 1

Maternal Outcomes GDM-diet v Control (2:1 matched by BMI & parity)

	MD	95%CI	P value
Hypertensive disorder	-0.009	-0.042, 0.023	0.615
Induction of labour	0.113	0.031, 0.951	**0.005**
Overall LUSCS rate	0.124	0.046, 0.210	**<0.005**
Emergency LUSCS rate	0.092	0.022, 0.162	**0.001**
Instrumental birth	-0.039	-0.100, 0.023	0.250
3rd/4th degree tear	0.002	-0.023, 0.024	0.987
PPH	0.007	-0.064, 0.079	0.843

Table 2

Fetal Outcomes GDM-diet v Control (2:1 matched by BMI & parity)

	MD	95%CI	P value
Birth <37 weeks	-0.037	-0.079, 0.006	0.158
Birth <34 weeks	-0.027	-0.055, 0.001	0.154
Birth weight (g)	48.82	-85.71, 105.71	0.084
Birth weight >95%	0.027	-0.027, 0.033	0.856
Birth weight >90%	0.193	-0.028, 0.066	0.373
Birth weight <10%	0.004	-0.043, 0.052	0.856
Hypoglycaemia	0.078	0.029, 0.127	**<0.001**
Respiratory distress	0.0002	-0.023, 0.024	0.987
Jaundice requiring phototherapy	-0.011	-0.025, 0.002	0.318
Apgar <7 at 5 minutes	0.008	-0.028, 0.043	0.649
NICU admission	-0.001	-0.039, 0.036	0.942
SCN admission	0.06	0.003, 0.117	**0.009**

CONCLUSION

- Compliance to ultrasound protocol was suboptimal and it would be desirable to assess barriers to implementation.
- The GDM-diet cohort were at no increased risk of primary adverse outcomes compared to a matched non-GDM cohort (with the exception of iatrogenic interventions) suggesting that this care pathway is appropriate.
- The average cost of care of GDM-diet exceeded the cost proposed in the generic lower risk model, which was attributed to both inadequate compliance and appropriate escalation of care. The average cost of managing GDM-insulin significantly exceeded the average expenditure on GDM-diet.
- Further prospective analyses are recommended to provide conclusive evidence demonstrating non-inferiority of our proposed management pathway with regards to health outcomes and significant economic benefits.

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