What are the clinical characteristics of women with GDM successfully managed using medical nutrition therapy alone?

R.A. Barnes[1], T. Wong[1,2], G.P. Ross[1,3], G Holters[1], L. MacDonald-Wicks[4], C.Smart[4], C. Collins[4], J.R. Flack[1,2]

[1] Diabetes Centre, Bankstown-Lidcombe Hospital, Bankstown NSW
[2] Faculty of Medicine, University of NSW, Sydney NSW
[3] Faculty of Medicine, University of Sydney, Sydney NSW
[4] Faculty of Health and Medicine, the University of Newcastle, Newcastle NSW

Background: Insulin resistance and reduced pancreatic beta cell reserve both contribute to the development of gestational diabetes (GDM). There are varying degrees of severity with some women requiring insulin therapy in addition to the mainstay management of Medical Nutrition Therapy (MNT). Identification of factors associated with the initiation of insulin therapy could assist in identifying women who are more likely to be successfully managed with MNT alone and potentially managed in a lower-risk setting.
Aim: To compare clinical and laboratory characteristics of women with GDM treated with MNT alone versus MNT plus Insulin (MNT+I), to achieve equivalent glycaemic targets.
Methods: Retrospective audit of prospectively collected de-identified clinical data from the Bankstown-Lidcombe Diabetes Centre database analysed for singleton births in women with GDM diagnosed according to ADIPS (1998) Australian criteria(1) (1993-2014). We compared MNT women versus MNT+I women across a range of clinically relevant parameters, thence assessed the outcome of Large for Gestational Age (LGA) between therapy types.
Results: The Table summarises clinical and laboratory variables associated with therapy type. Prior GDM, previous fetal macrosomia, family history of diabetes, ethnicity, maternal age, nulliparity, pre-pregnancy obesity (BMI ≥ 30 kg/m^2), maternal weight gain (total and according to Institute of Medicine (IOM) criteria(2)), gestational age at diagnosis, fasting BGL and HbA1c at GDM diagnosis were all found to be significantly different between therapy types.

Table 1 Parameter	MNT only Mean ± SD or n= (%)	Insulin Mean ± SD or n= (%)	P-value
Total	2713 (67.6%)	1302 (32.4%)	
Clinical parameters			
Prior GDM	532 (19.6)	131 (33.1)	<0.001
Previous Fetal Macrosomia (>4kg)	219 (8.1)	148 (11.4)	<0.001
Family history of diabetes	1462 (53.8)	873 (67.0)	<0.001
Ethnicity			<0.001
European	559 (20.6)	336 (25.8)	
Middle Eastern	706 (26.0)	431 (33.1)	
East/South-East Asian	1020 (37.6)	298 (22.9)	
South Asian	294 (10.8)	160 (12.3)	
Others	137 (5.0)	78 (6.0)	
Age	31.8 ± 5.5	32.5 ± 5.3	<0.001
Nulliparity	945 (34.8)	380 (29.2)	<0.001
Obesity (pre-pregnancy BMI ≥ 30 kg/m^2)	468 (17.7)	487 (38.1)	<0.001
Gestational age at diagnosis (weeks)	27.9 ± 5.3	24.6 ± 6.5	<0.001
Fasting BGL in OGTT	5.0 ± 0.7	5.5 ± 1.0	<0.001
HbA1c at GDM diagnosis	5.2 ± 0.6	5.5 ± 0.7	<0.001
Total maternal weight gain	12.0 ± 5.9	12.6 ± 6.7	<0.01
Maternal weight gain compared to IOM			<0.001
Below IOM guidelines	837 (32.8)	246 (20.0)	
Within IOM guidelines	831 (32.5)	357 (29.0)	
Above IOM guidelines	886 (34.7)	629 (51.1)	

IOM = Institute of Medicine

The LGA rate was significantly greater for MNT+I compared to treatment with MNT alone (19.9%vs12.0%, p<0.001).

Conclusions: In this multi-ethnic high-risk cohort of GDM women, there are a number of significant clinical variables that are associated with successful treatment with MNT only. The identification of these clinical characteristics and laboratory measures may enable prediction of which women with GDM are more likely to be suitable for management by MNT alone in a lower-risk setting.

Acknowledgements: We wish to thank all the Diabetes Educators who have collected data and maintained the database.

References:

1. Hoffman L, Nolan, C, Wilson, JD, Oats JJN, Simmons D. Gestational diabetes mellitus management guidelines. The Australasian Diabetes In Pregnancy Society. MJA 1998; **169**: 93-97.
2. Institute of Medicine. Weight Gain During Pregnancy: Reexamining The Guidelines. Report Brief: May 2009. National Academies Press, 500 Firth Street, N.W., Lockbox 285, Washington DC.