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ORGANISING COMMITTEE

ORGANISING COMMITTEE

Dr Glynis Ross, *President ADIPS*
Associate Professor Aidan McElduff, *Secretary ADIPS*
Christine Boorman, *Treasurer, ADIPS*
Dr Bill Jeffries, *Conference Local Organiser, ADIPS*

CONFERENCE SECRETARIAT

ASN Events Pty Ltd
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DELEGATE INFORMATION

THE ORGANISER'S OFFICE – ASN EVENTS

The organiser's office will be located in the Function Foyer, outside the main conference room Shiraz A/B. Any enquiries can be directed to ASN staff at the organiser's office, with the exception of enquiries regarding accommodation which should be directed to the reception desk.

The Conference office hours are:

Friday:	8:00pm – 6:30pm
Saturday:	8:00am – 2:00pm
Sunday:	8:00am – 12:00pm

WHAT YOUR REGISTRATION INCLUDES

Delegate and student registrations include:

* Access to the sessions of your choice
* Satchel and delegate handbook
* Morning Tea and Lunch
* Welcom Buffet

SOCIAL PROGRAM

Poster Session: The Friday night poster session will also include a wine tasting of locally produced Tscharke wines with cheese

Welcome Buffet Dinner: On the first night (Friday 28 August), the Welcome Dinner will be held from 7:30 pm – 10.30 in the Shiraz Room. It will be a buffet dinner with a complimentary drink upon arrival. This item must be selected on your registration in order to obtain your included ticket. Partner tickets can be purchased in advance for $50 per person.

Conference Dinner: The Conference Dinner (Saturday 29th August) will be held from 7.00pm – 10.30pm in the Shiraz Room. It will be a 3 course meal with a complimenary drink upon arrival. Dinner tickets can be purchased in advance for $80 per person.

Wine Tour: The Barossa Vally is Australia's most famous wine region. The conference is running a Wine Tour to three prominent local winaries on Saturday (29th August) from 2 - 5pm.
Grant Burge - 2.05pm - 2.45pm
Langmeil Wines - 3.00pm - 4.10pm
Stanley Lambert - 4.15pm - 5.00pm
There are still ticket avalaible for $25 per person.

TRANSFERS

Buses will be provided for delegates at a cost of $25 each transfer.

On Friday 28th August, after the joint session with ADS & ADEA at the Adelaide Convention Centre, 2 coaches will depart Adelaide Convention Centre for the Novotel Barossa at 1:00pm, arriving approx. 2:30pm
On Sunday 30th August, 2 coaches will leave the Novotel Barossa Valley Resort at 11:30am to take delegates back to the Adelaide Convention Centre then onto the Adelaide Airport arriving around approximately 1:45pm.

SPEAKER PREPARATION INSTRUCTIONS

All sessions are beinfg held in the Shiraz Room. It is the organiser's preference to have **ALL** talks pre-loaded to the common laptop which is a PC. As per instructions already supplied, you should provide your talk on a CD or USB/memory stick to the ASN Events representative at the registration desk well before the session you are participating in so it can be loaded and tested.

DISPLAYING YOUR POSTER

The Eli Lilly Poster Session is being held from 6.30pm - 7.30pm on Friday 28th August in the Function Foyer. Posters will be displayed only on the day of your poster session in the Function Foyer. Posters should be put up as soon as you arrive at the venue and must be removed after the poster session is finished. Please locate your abstract number for correct positioning. The maximum size allowed is 1.0 m wide by 1.2 m high. The approved method for attaching your poster is with blutac. Please visit the organiser's office for supplies.

EMAIL AND INTERNET ACCESS

Wired Broadband Internet is available in all accommodation and function rooms. The main building (including the Conference Centre) is within our WIFI hotspot, so all you need is a "WiFi" card installed in your laptop to connect. WiFi access cards can be purchased from Reception. A 2 hour access card is $26, while a 30 min access card is $15 (charged in 1 minute blocks).

USEFUL PHONE NUMBERS

Novotel Barossa Valley Resort: +61 8 8524 0000
Harry's Restaurant (part of Novotel Barossa Valley Resort): +61 8 8524 0025
Tanunda Pines Golf Course: +61 8 8563 1200
Endota Day Spa: +61 8 8524 0071

SETTLING YOUR ROOM ACCOUNT WITH YOUR HOTEL

On departure from Novotel Barossa Valley Resort please settle your room account/check out by 11:00 am that morning. Concierge will have facilities to store baggage if required.

References: 1. NovoRapid® Approved Product Information.
Minimum Product Information* NovoRapid® (insulin aspart (rys)). **Indications:** Treatment of diabetes mellitus. **Contraindications:** Hypoglycaemia. Hypersensitivity to insulin aspart or excipients. **Precautions:** Inadequate dosing or discontinuation of treatment may lead to hyperglycaemia and diabetic ketoacidosis. Where blood glucose is greatly improved, e.g. by intensified insulin therapy, patients may experience a change in usual warning symptoms of hypoglycaemia, and should be advised accordingly. The impact of the rapid onset of action should be considered in patients where a delayed absorption of food might be expected. **Interactions:** Oral hypoglycaemic agents, octreotide, monoamine oxidase inhibitors, non-selective, beta-adrenergic blocking agents, angiotensin converting enzyme (ACE) inhibitors, salicylates, alcohol, anabolic steroids, alpha-adrenergic blocking agents, quinine, quinidine, sulphonamides, oral contraceptives, thiazides, glucocorticoids, thyroid hormones, sympathomimetics, growth hormone, diazoxide, asparaginase, nicotinic acid. **Pregnancy Category: A.** Insulin aspart can be used in pregnancy (see 'Clinical Trials' in full PI). **Children:** NovoRapid® can be used in children. Clinical experience is available in children aged 2 years and over (see 'Clinical Trials' in full PI). ***Elderly:** No safety issues were raised in elderly patients with type 2 diabetes (mean age 70 years) in a PK/PD trial but careful glucose monitoring may be necessary in elderly patients (see 'Clinical Trials' in full PI). **Adverse Effects:** Hypoglycaemia. **Dosage and Administration:** Dosage as determined by physician. NovoRapid® should be administered immediately before a meal, or when necessary after the start of a meal. Discard the needle after each injection. NovoRapid® can be used subcutaneously, intravenously or (10mL vial only) via continuous subcutaneous insulin infusion ('CSII'). Refer to full PI before prescribing, available on request (March 2009).

*Note changes in Product Information.

PBS Information: This product is listed on the PBS as a drug for the treatment of diabetes mellitus

Before prescribing, please review Product Information available from Novo Nordisk.

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SPEAKERS

Keynote Speaker

Professor David Sacks,
Kaiser Foundation Hospital, United States

Novo Nordisk ADIPS

Professor David Sacks of the Kaiser Foundation Hospital, Bellflower, California is the Novo Nordisk ADIPS Keynote Speaker for 2009. Professor Sacks is an Obstetrician Gynaecologist and Maternal Fetal Medicine specialist who has extensive clinical and research experience in Diabetes in Pregnancy. He is a co-author of the Hyperglycaemia and Pregnancy Outcomes Study (HAPO). He delivered the Norbert Freinkel Lecture to the American Diabetes Association 2008 and has recently been honoured with awards for both teaching and collaborative practice.

Symposia Speakers

Associate Professor Leonie Callaway,
Royal Brisbane and Women s Hospital, University of Queensland

A/Prof Leonie Callaway is an obstetric physician, researcher and educator. She has a conjoint appointment as Head, Royal Brisbane Clinical School, University of Queensland, and Specialist in Internal and Obstetric Medicine, Royal Brisbane and Women's Hospital. Her PhD was in the area of obesity in pregnancy. Ongoing interests include preconception care, lifestyle interventions in pregnancy and neonatal body composition. She is a Chief Investigator on a major NHMRC project to understand the relationship between the complement cascade, obesity, diabetes, preeclampsia and growth restriction.

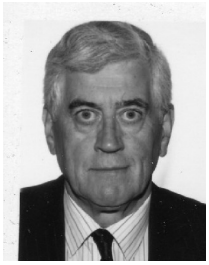
Professor James Dunbar,
Greater Green Triangle
University Department of Rural Health, Deakin & Flinders Universities

Professor James Dunbar (MD, FRCPEdin, FRCGP, FRACGP, FFPHM, FACRRM) inaugural Director of the GGT UDRH since 2001, was previously Medical Director at Borders Primary Care National Health Services Trust in the United Kingdom. He is Editor-in-Chief of the Australian Journal of Rural Health; author or editor of several books; chapters in over ten books and over 100 original articles. Professor Dunbar teaches Clinical Governance and Risk Management for Flinders University in Adelaide, Singapore and China. He was the Inaugural Director of the National Primary Care Collaboratives. His research interests include the prevention of diabetes and quality improvement in health care, especially for the chronic diseases depression, diabetes and heart disease.
If you require any further information on James, please go to our website
http://www.greaterhealth.org/about/staff/james-dunbar

Professor David McIntyre,
Mater Health Service, University of Queensland
Director of Endocrinology and Obstetric Medicine Mater Health Services
Head of Mater Clinical School

Professor David McIntyre is Director of Endocrinology and Obstetric Medicine at Mater Health Services, South Brisbane and Head of the Mater Clinical School of the University of Queensland.
David's research and clinical interests cover medical disorders of pregnancy, regulation of fetal growth and intensive therapy of Type 1 diabetes. Recent studies have examined the effects of obesity and hypertensive disorders of pregnancy on immediate and later maternal and infant health.
David is also a past President of the Australasian Diabetes in Pregnancy Society (2002 – 2006) and served as Co Chair of the National Diabetes in Pregnancy Advisory Committee for the Commonwealth Department of Health and Ageing over that period. Recently, he has been involved in the International Association of Diabetes in Pregnancy Study Groups attempts to translate the HAPO study results into an internationally accepted definition of abnormal glucose metabolism in pregnancy.

Professor Robert Moses
Diabetes Services/University of Wollongong
Professor Robert Moses has been in private practice in the Wollongong are since 1975. He has a part-time staff specialist role as the Director of Diabetes Services and an appointment at the University of Wollongong Graduate School of Medicine. He has gradually focused his practice and research interests to the problems associated with diabetes in pregnancy. He heads an active clinical trial unit. He has published widely on the subject of diabetes and pregnancy and is currently an Associate Editor of Diabetes Care.



Professor Jeremy Oats,
Royal Women s Hospital/Mercy Hospital, University of Melbourne
Qualifications: MBBS (Adelaide) DM (Nottingham) FRCOG FRANZCOG
Current Appointments:
Director Victorian Maternity Newborn Clinical Network
Chair Victorian Consultative Council on Obstetric and Paediatric Mortality and Morbidity
Director Victorian Maternity Newborn Clinical Network
Medical Advisor to Maternity Services, Metropolitan and Aged Care Services Department of Health , Victoria
Director Clinical Practice Improvement Unit Royal Women's Hospital, Melbourne Head Diabetes Service RWH
Professorial Fellow Department of Obstetrics and Gynaecology University of Melbourne
Adjunct Professor School of Public Health La Trobe University
Secretary General International Association of Diabetes and Pregnancy Study Groups
Member of Council ADIPS and past Secretary and President.
Member Steering Committee of HAPO
Co Chair Expert Advisory Committee Australian National Evidence Based Antenatal Care Guidelines
Member National Maternity Council
Previous Appointments:
Professor and Director of Obstetrics and Gynaecology Mater Mothers' Hospital and University of Queensland
President Women's Hospitals Australasia
Federal Secretary RANZCOG

Dr Nimalie Perera,
Royal Prince Alfred Hospital, Sydney
Dr Nimalie J Perera (MBBS Hons) is in her final year of training towards combined qualification in Endocrinology and Chemical Pathology at Royal Prince Alfred Hospital, Sydney. She has experience working through different specialities in Clinical Endocrinology including Diabetes, Pregnancy Diabetes, Thyroid, Pituitary, Adrenal disorders, Metabolic Bone disease as well as Cardiovascular Disease Prevention and Lipid Management. She has a strong grasp of scientific analytical methods and concepts. With her combined qualification in Endocrinology and Chemical Pathology her aim is to peruse a career in clinical and laboratory Metabolic Medicine.

Professor Prasuna Reddy
Greater Green Triangle
University Department of Rural Health, Deakin & Flinders Universities
Professor Prasuna Reddy is Chair of Rural Mental Health and Director Health Services Research. She is a practising health and organisational psychologist and her areas of expertise are applied psychology in health systems, and professional ethics. Professor Reddy is responsible for managing a number of grants held by the Department which include NHMRC, ARC and Carrick grants in the areas of diabetes prevention, clinical links between depression, heart disease and diabetes, management of chronic disease, quality and safety in organisational environments, and interprofessional ethics. She has given numerous invited presentations in Australia and overseas at universities, conferences and community health arenas and her publications include several books, book chapters, refereed journal articles and contracted reports. Currently she is a member of the Human Research Ethics Committee of the Department of Human Services Victoria, the Deputy Editor of the Australian Journal of Rural Health, and serves on the board of Antares, a humanitarian aid organisation. Professor Reddy is also co-ordinator of the Ethics Law and Professional Development program at Deakin University School of Medicine and Director of Training for the Life! Taking action on diabetes program, a joint initiative of the Victorian Government and Diabetes Australia – Victoria.
If you require any further information about Prasuna, please go to this website
http://www.greaterhealth.org/about/staff/prasuna-reddy/

Dr Janet Rowan
National Women's Health

I am general physician in and have subspecialised in “Obstetric Medicine” since 1994. I am predominantly a clinician and run the multidisciplinary diabetes in pregnancy service at National Women’s Hospital, Auckland. We have over 600 deliveries each year through our ethnically diverse clinic. This includes about 70 women with a prepregnancy diagnosis of type 2 diabetes, and 30-35 women with type 1 diabetes. The rest of the women are diagnosed with GDM, but about 25% of these have underlying glucose intolerance or type 2 diabetes diagnosed at 8 weeks postpartum. I was the principal investigator in the recently published Metformin in Gestational diabetes trial (MiG) and have just completed the Auckland follow up of two year olds: The Offspring Follow Up (TOFU).

I have an Honorary University position with the Department of Obstetrics and am a keen teacher to junior doctors and other health professionals.

Dr Glynis Ross,
Royal Prince Alfred Hospital, Bankstown-Lidcombe Hospital, Sydney

Dr Glynis Ross is a Visiting Endocrinologist at Royal Prince Alfred Hospital, Sydney and part-time Senior Staff Specialist at Bankstown-Lidcombe Hospital, Sydney. Her major clinical and research interests are in diabetes & pregnancy. She has been on Council of the Australasian Diabetes in Pregnancy Society (ADIPS) from 1991-1998 and since 2002. Since 2008 she has been President of ADIPS.

PROGRAM

Friday, 28 August 2009

Hyperglycaemia, Obesity and Pregnancy
9:00 AM - 10:30 AM — Hall C, Adelaide Convention Centre

Chair: Glynis Ross

9:00am **Leonie Callaway**
From preconception care to obesity in the 22nd century: Does maternal obesity matter? *abs#001*

9:30am **David McIntyre and Jeremy Oats**
Hyperglycemia and Adverse Pregnancy Outcome (HAPO) Study: Associations with Maternal BMI *abs#002*

10:00am **Janet Rowan**
Glycaemia and obesity: relationships to outcomes in the MiG trial *abs#003*

Morning Tea
10:30 AM - 11:00 AM — Exhibition Hall, Adelaide Convention Centre
Wah Cheung Vice President ADS, Launch of 'Life! After Gestational Diabetes Mellitus' at the ADS stall

The ADS/ADIPS Skip Martin Plenary Lecture
11:00 AM - 12:00 PM — Hall E, Adelaide Convention Centre
Chair: Aidan McElduff

David Sacks
Preconception care for women who have diabetes: Background, barriers, and strategies for implementation *abs#004*

ADIPS delegates bus to Novotel Barossa Valley Resort
12:30 PM - 5:00 PM — from outside Adelaide Convention Centre

ADIPS Council meeting
3:30 PM - 5:00 PM — Merlot Meeting Room, Barossa Novotel

Welcome and Opening of Meeting
5:00 PM - 5:10 PM — Shiraz A, Barossa Novotel

The proposed IADPSG recommendations on the Diagnosis and Classification of Hyperglycaemia in Pregnancy
5:10 PM - 6:30 PM — Shiraz A, Barossa Novotel

Jeremy Oats and David McIntyre
The proposed IADPSG recommendations on the Diagnosis and Classification of Hyperglycaemia in Pregnancy *abs#005*

Eli Lilly Poster Session
6:30 PM - 7:30 PM Shiraz B, Barossa Novotel

Buffet dinner
7:30 PM - 10:30 PM Shiraz combined, Barossa Novotel

Saturday, 29 August 2009

Fetal Macrosomia and Diabetes: what is it, why it is and what to do about it'
8:30 AM - 9:30 AM Shiraz combined, Barossa Novotel

David Sacks
Fetal macrosomia and diabetes: What is it, why it is, and what can we do about it? *abs#006*

Free Communications
9:30 AM - 10:30 AM Shiraz combined, Barossa Novotel

9:30am **Robyn Barnes**
Predictors of LGA and SGA birthweight in women with gestational diabetes mellitus *abs#007*

9:45am **Arjuna Pathmaperuma**
Fatty acids upregulate their own storage into lipid droplets and promote cell aggregation and cytokine production independent of glucose in human cytotrophoblasts *abs#008*

10:00am **Ingrid Rowlands**
Fasting glucose and insulin profiles among obese women in pregnancy: Does exercise help? *abs#009*

10:15am **Daniel Chen**
Early Gestational Glucose Tolerance Testing in women with a history of GDM *abs#010*

Morning Tea
10:30 AM - 11:00 AM
Function Foyer

Diabetes after Gestational Diabetic pregnancy
11:00 AM - 12:00 PM Shiraz combined, Barossa Novotel

James Dunbar & Prasuna Reddy
Reducing the risk of developing type 2 diabetes after gestational diabetes: a model of system-level change *abs#011*

Oration: 'Pregestational Diabetes - the last 20 years : have we made any progress?'
12:00 PM - 12:30 PM Shiraz combined, Barossa Novotel
Chair: Jeremy Oats

Jeremy Oats
Pregestational diabetes in Victoria 1983-2007 have we made any progress? *abs#012*

ADIPS Annual General Meeting
12:30 PM - 1:00 PM — Shiraz combined, Barossa Novotel

Lunch and free afternoon - Optional winery tour
1:00 PM - 5:00 PM — Function Foyer

ADIPS Conference Dinner
7:00 PM - 10:30 PM — Shiraz combined, Barossa Novotel

Sunday, 30 August 2009

Glucose Monitoring in Pregnancy
9:00 AM - 10:30 AM — Shiraz combined, Barossa Novotel

Nimalie Perera
Evaluation shows Sub-optimal Performance of Blood Glucose Meters in an Antenatal Diabetes Clinic *abs#013*

9.45am **Wah Cheung & Chris Nolan**
Additional Glucose Meter Evaluation in Pregnancy

10.00am **ADIPS Panel and Audience Discussion**
Panel: Nimalie Perera, Wah Cheung, Aidan McElduff, Chris Nolan
Use of Glucose Meters in pregnancy: Which meters, what targets?

Draft IDF Guidelines
10:30 AM - 11:00 AM — Shiraz combined, Barossa Novotel

Robert Moses
International Diabetes Federation (IDF) guidelines for pregnancy *abs#014*

Prizes Ceremony and Closing Ceremony
11:00 AM - 11:15 AM — Shiraz combined, Barossa Novotel

Morning Tea then Departure
11:15 AM - 11:30 PM — Function Foyer
Buses leave approx 11:30am

New KwikPen has landed

KwikPen – A new insulin carrier for Australians with diabetes

Announcing KwikPen – a new prefilled insulin pen from Eli Lilly. Small, lightweight (weighs 31 grams) and easy to use.[1,2] Ideal for on-the-go patients of all ages.[1,3]
KwikPen. The Kwik way.

PBS LISTED 1 JULY[4]

PBS Information: General benefit. Treatment for Diabetes.
Refer to PBS Schedule for full PBS listing information for each product.

Humalog mix25™ new KwikPen™
25% insulin lispro (rDNA origin) injection
75% insulin lispro protamine suspension

HUMALOG,® HUMALOG MIX25,® HUMALOG MIX50® MINIMUM PRODUCT INFORMATION. PLEASE REVIEW APPROVED PRODUCT INFORMATION BEFORE PRESCRIBING. FULL PI IS AVAILABLE FROM ELI LILLY. **Approved Indication:** Treatment of diabetes mellitus. **Contraindications:** Hypoglycaemia; hypersensitivity to insulin lispro or one of its excipients; intravenous administration. **Precautions:** Any change of insulin or human insulin analogue should be made under medical supervision; loss of warning symptoms of hypoglycaemia; adjust dose for changes in exercise, diet and illness; should not be mixed with other insulins. **Adverse Reactions:** Hypoglycaemia, allergic reactions and lipodystrophy. **Dosage:** As determined by physician; subcutaneous injection; before meals (15 minutes). **PBS dispensed price:** Humalog KwikPen, Humalog Mix25 KwikPen, Humalog Mix50 KwikPen $263.79 (5x5x3mL); Humalog vial $158.84 (5x10mL). Refer to full PI for complete dosage information. Please review full PI before prescribing. **Full PI is available from Eli Lilly Australia Pty. Limited. 112 Wharf Road, WEST RYDE NSW 2114. Based on PI last amended 14 May 2009. References 1.** Brown AW. (2008) *Clinical Diabetes* 26(2):66-71. **2.** Ignaut DA, et al. (2008) *J Diabetes Sci Technol* 2(3):533-5. **3.** Fowler MJ. (2000) *Clinical Diabetes* 26(3):130-133. **4.** Australian Government, Department of Health and Ageing. PBS http://www.pbs.gov.au/html/home

Lilly

POSTER LISTING

Eli Lilly Poster Session

Shiraz B, Barossa Novotel

6.30pm - 7.30pm, Friday 28 August

Amanda Aylward
A structured pre-pregnancy group education program for women with type 2 diabetes mellitus *abs#0210*

Robyn Barnes
Optimal maternal weight-gain according to pre-pregnancy BMI in women with gestational diabetes mellitus *abs#022*

Jenny Bradford
Concerns Regarding Assisted Conception in Obese Individuals *abs#023*

Wah Cheung
Vitamin B12 levels in Pregnancy Following Metformin Use *abs#024*

Frances Doran
Physical activity, pregancy and gestational diabetes: more attention needed to support women to be active during pregnancy *abs#025*

Ashley Fong
Maternal serum 25-Hydroxyvitamin D concentrations and the association of gestational diabetes mellitus *abs#026*

Kishani Kannangara
Two cases of euglycaemic ketoacidosis in pregnancy *abs#027*

Janet Lagstrom
Life after gestational diabetes: Reduce your risk of diabetes... *abs#028*

Siew Lan Li
The benefits of Freestyle Navigator ™ in pregnancy *abs#029*

Siew Li
Perceptions of women following the diagnosis of Gestational Diabetes Mellitus (GDM) *abs#030*

Anna Lih
The relationship between sociodemographic correlates and body mass index in Type 1 and 2 pregestational diabetes: the effects on pregnancy outcomes *abs#031*

Jane Payne
Post-partum Attitudes and Options for Follow-up of Women with Gestational Diabetes Mellitus *abs#032*

INDEX OF ABSTRACT AUTHORS

ABSTRACTS

ORAL

001

FROM PRECONCEPTION CARE TO OBESITY IN THE 22ND CENTURY: DOES MATERNAL OBESITY MATTER?

L. Callaway

Staff Specialist in Internal and Obstetric Medicine, Royal Brisbane and Women's Hospital and The University of Queensland School of M, Australia

Obesity is a major public health issue which increasingly affects every facet of medical care. Maternal and neonatal care is equally impacted by changing patterns of obesity in our society. A brief overview of the epidemiology and complications of maternal obesity will be presented.

Preconception care is a critical issue in addressing obesity prior to pregnancy. Barriers to preconception care include: lack of knowledge about the full range of risks associated with obesity, failure of women to personally recognize that they are obese, low rates of pregnancy planning, and poor results from attempts to lose weight prior to pregnancy.

There are a number of guidelines for the management of obesity during pregnancy. Much of this is based on opinion, rather than high quality evidence. Our own experience of running a pilot randomized controlled trial of exercise in obese pregnant women highlighted a number of issues. In our study participants, the rates of psychological issues and previous childhood trauma were high. Obese women were not aware of the guidelines around weight gain in pregnancy. The dietary intake of obese women was very low in folic acid and other key nutrients, and very high in "non core foods". Although most women intended to exclusively breastfeed, many women did not achieve this goal.

Hypertensive disorders of pregnancy are an important complication of obesity. The mechanisms underpinning this are unclear. However, epidemiological work points to insulin resistance as key to the pathogenesis of preeclampsia. The longer term follow up of women with hypertensive disorders of pregnancy shows an ongoing important relationship with obesity and insulin resistance.

One of the key questions for neonates born to obese women is regarding their own long term risk of obesity. Some authors have argued that there is a 'vicious cycle" with maternal obesity leading to increased obesity in the next generation. Preliminary data regarding neonatal body composition in obese pregnant women will be presented.

002

HYPERGLYCEMIA AND ADVERSE PREGNANCY OUTCOME (HAPO) STUDY: ASSOCIATIONS WITH MATERNAL BMI

D. McIntyre, B. Metzger, L. Lowe, A. Dyer, P. Catalano, E. Trimble, B. Persson, J. Oats, M. Hod, D. Hadden, D. Coustan

HAPO Study Cooperative Research Group, Australia

Objective To determine whether higher maternal BMI, independent of maternal glycemia, is associated with adverse pregnancy outcomes.

Design Observational cohort study

Setting Fifteen centers in nine countries.

Population Eligible pregnant women

Methods 75gm 2-hour OGTT between 24 and 32 weeks gestation in all participants. Maternal BMI calculated from height and weight measured at the OGTT. Fetal adiposity assessed using skinfold measurements and calculated percent body fat. Associations were assessed using multiple logistic regression analyses, with adjustment for potential confounders.

Main Outcome Measures Pre-defined primary outcomes were birthweight >90th percentile, primary cesarean section, clinical neonatal hypoglycemia, cord serum C-peptide >90th percentile.

Results Among 23,316 blinded participants, with control for maternal glycemia and other potential confounders, higher maternal BMI was associated (odds ratio [95% confidence interval] for highest {>44.0 kg/m^2} vs lowest {<23.2 kg/m^2}BMI categories) with increased frequency of birthweight > 90th percentile (3.04 [2.00 – 4.61]) and % body fat > 90th percentile (3.25 [2.16 – 4.88]), cesarean section (2.10 [1.47 – 2.99]), cord C-peptide > 90th percentile (2.80 [1.78 – 4.40]), and pre-

eclampsia (14.50 [9.29 – 22.65]). Preterm delivery was less frequent with higher BMI (0.56 [0.34 – 0.93]). Associations with fetal size tended to plateau in the highest maternal BMI categories.

Conclusion Higher maternal BMI, independent of maternal glycemia, is strongly associated with increased frequency of pregnancy complications, in particular those related to excess fetal growth and adiposity and to pre-eclampsia.

003

GLYCAEMIA AND OBESITY: RELATIONSHIPS TO OUTCOMES IN THE MIG TRIAL

J. Rowan[1], W. Gao[2], W. M. Hague[3], H. D. McIntyre[4]

[1]National Women's Hospital, New Zealand
[2]Auckland University of Technology, New Zealand
[3]Women's and Children's Hospital, Australia
[4]Mater Hospital, Australia

Objectives: To determine how glucose control in women with GDM treated with metformin and/or insulin influenced pregnancy outcomes. Also, to identify whether baseline glycemia or obesity influenced outcomes.

Research, Design and Methods

Women randomized to metformin or insulin treatment in the Metformin in Gestational diabetes (MiG) trial had baseline glucose tolerance test results and HbA1c documented, together with all capillary glucose measurements during treatment. In the 724 women who had glucose data for analysis, tertiles of baseline glucose tolerance test and HbA1c, and of mean capillary glucose values during treatment, were calculated. The relationships between maternal factors, glucose values and outcomes (including a composite of neonatal complications, maternal preeclampsia and birth weight) were examined with bivariable and multivariate models.

Results: By multivariate analysis, when baseline glycemia measures were included, large for gestational age (LGA) was associated with baseline HbA1c ($p=0.003$) but no other outcome was predicted by baseline measures. Neonatal complications were related to fasting capillary glucose means during treatment ($p<0.001$) and nulliparity ($p<0.001$); previous delivery of baby >4000g was associated with lower risk of neonatal complications ($p=0.001$). Preeclampsia was related to postprandial capillary glucose during treatment (p-0.01), maternal overweight ($p=0.03$) but not obesity, Polynesian ethnicity ($p=0.03$) and previous gestational hypertension ($p<0.001$). Small for gestational age infants were not associated with glucose measures but LGA infants were associated with postprandial capillary glucose during treatment ($p=0.001$) and previous delivery of baby >4000g ($p<0.001$). Obesity did not influence outcomes. There was no interaction between glycaemic control, randomized treatment or maternal BMI in predicting outcomes.

Conclusions: Glucose control in women with GDM who are treated with metformin and/or insulin is strongly related to outcomes. It may be that pharmacotherapy more strongly modifies fetal nutrient supply that dietary measures alone, and overrides any effect of obesity

004

PRECONCEPTION CARE FOR WOMEN WHO HAVE DIABETES: BACKGROUND, BARRIERS, AND STRATEGIES FOR IMPLEMENTATION

D. Sacks

Kaiser Foundation Hospital, Bellflower, CA, United States

Preconception care (PCC) is necessary to assure optimal maternal and perinatal outcome for the woman who has diabetes and/or who is at increased risk for the development of diabetes. The risk of major anomalies is related to maternal hyperglycemia during organogenesis, i.e. between the 5^{th} and 8^{th} weeks following last menses. Components of a PCC program include education of participating health care providers and identification, recruitment, and retention of reproductive-age women who have diabetes. Education about and administration of contraception to enable deferring conception until normoglycemia is established is essential. Although PCC for women who have had GDM is different from that offered women with pregestational diabetes, both groups should be recruited into a PCC program. Both diet and exercise and metformin have been shown to be equally effective in reducing the risk of diabetes in women who had previous GDM. Women with known diabetes should be evaluated and, when necessary, treated for such complications of diabetes as retinopathy, nephropathy, neuropathy, and hypertension. Potentially teratogenic medications commonly used in the care of

diabetic women such as ACE-inhibitors, ARBs, and statins, should be discontinued when efforts to conceive are begun. Non-teratogenic antihypertensive medications such as methyldopa, labetalol, and nifedipine may be used to maintain normotension before and during pregnancy. The woman and those who assist in her care should be made aware of the work necessary to assure optimal neonatal outcome (e.g. lower glycemic concentrations, regimented diet and activity, multiple insulin injections, frequent glucose monitoring, frequent visits with the health care team). Several PCC programs have reported success in reducing maternal glycated hemoglobin and fetal malformations. Remaining challenges include the establishment of such programs and the recruitment and retention of reproductive age women who may benefit from them.

005

THE PROPOSED IADPSG RECOMMENDATIONS ON THE DIAGNOSIS AND CLASSIFICATION OF HYPERGLYCAEMIA IN PREGNANCY

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Following the publication of the HAPO study findings, an international panel under the auspices of the International Association of Diabetes and Pregnancy Study Groups has been preparing recommendations on the diagnostic criteria for GDM and the identification of "overt diabetes mellitus" during pregnancy.

The draft recommendations will be presented and their implications discussed.

006

FETAL MACROSOMIA AND DIABETES: WHAT IS IT, WHY IT IS, AND WHAT CAN WE DO ABOUT IT?

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The large baby has been variously defined by an absolute birth weight, by birth weight relative to gestational age, and by weight/length ratios. The infant of the diabetic mother (IDM) is distinguished by having fat as a larger component of birth weight than does the neonate of the woman who does not have diabetes. Some evidence suggests that subcutaneous fat in the IDM is distributed more to the upper than to the lower body. This finding may explain the increased incidence of shoulder dystocia in IDMs whose birth weight is equivalent to that of infants of non-diabetic women. Of major interest is the finding of heavy babies despite apparently well-controlled maternal glycemia. Potential explanations include the possibility that glycemic measures other than those taken pre- or post-meal may be better correlated, and that maternal glycemia earlier in pregnancy is a better correlate of birth weight than that later in pregnancy. Also, multivariate analyses have found a number of variables in addition to maternal glycemia to be independently associated with birth weight. Maternal overweight and obesity are potentially modifiable correlates of neonatal weight. Limiting weight gain during pregnancy has been reported to decrease post-pregnancy weight retention and may also serve to limit birth weight. Particularly among poorer women, practical concerns that interfere may with compliance with diet and exercise requirements include insufficient income to purchase appropriate foods, work schedules, finding safe places to walk, and the prevalence of smoking, drug and alcohol abuse. Those programs which have reported success in weight limitation have included frequent contacts with patients, encouragement and assistance with problem solving of obstacles to compliance, and individualized frequency of visits depending on success of appropriate weight maintenance during pregnancy.

007

PREDICTORS OF LGA AND SGA BIRTHWEIGHT IN WOMEN WITH GESTATIONAL DIABETES MELLITUS

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Background: Gestational diabetes mellitus[GDM] is a cause of macrosomia, however the effect of other factors on birthweight is less clear.

Aim: To identify predictors of large and small for gestational age[LGA, SGA] in GDM women.

Methods: Data were analysed from our computerised database for singleton births in women diagnosed with GDM, by ADIPS criteria, since 1994. Therapy was diet, with insulin commenced if optimal targets were not reached [fasting BGL<5.5mmol/l and 2-hour postprandial BGL<7mmol/l]. Exclusions: incomplete data [except HbA1c], delivery <36weeks gestation and/or where last recorded clinic weight was >4weeks before delivery. We assessed: pre-pregnancy BMI, weight-gain [total; pre; and post-GDM treatment initiation], GDM presentation HbA1c, and ethnicity. Birthweight was converted to gestational age percentile [LGA>90th;SGA<10th]. Multiple regression analyses were undertaken-statistical significance $p<0.05$.

Results: There were 1698 women first seen at [Mean±SD] 28.1±5.3 weeks gestation [range 6-39]. Ethnic mix: Anglo-Saxon 281[16.6%], Asian 775[45.6%], Middle Eastern 490[28.9%], European 99[5.8%]; Oceania 53[3.1%]. Therapy was diet 1174[69.1%] and insulin 524[30.9%]. Mean total weight-gain was 12.4±6.2 kg, the majority gained before intervention. The Table shows other potential predictors.

Other potential predictors of birthweight	Mean±SD
Pre-gestational BMI-based on self-reported weight	26.1±6.4 kg/m2
Weight-gain pre-GDM treatment initiation	10.6±6.0
Weight-gain post-GDM treatment initiation	1.7±3.0
GDM diagnosis HbA1c[n=1567]	5.3±0.6
Mean gestational age at delivery[weeks]	39.0±1.2

There were 191[11.3%] LGA and 182[10.7%] SGA births. Significant independent predictors, in order of contribution, for LGA infants were: pre-pregnancy BMI, weight-gain after intervention, weight-gain before intervention and HbA1c. Significant predictors of SGA were pre-pregnancy BMI, weight-gain before intervention and weight-gain after intervention. Ethnicity was not a predictor of LGA or SGA.

Conclusion: Whilst pre-pregnancy BMI was the strongest predictor, the pattern of weight-gain and risk of LGA versus SGA differed, with SGA risk more determined by weight-gain before GDM treatment intervention. LGA risk may be reduced by weight management after GDM presentation.

008

FATTY ACIDS UPREGULATE THEIR OWN STORAGE INTO LIPID DROPLETS AND PROMOTE CELL AGGREGATION AND CYTOKINE PRODUCTION INDEPENDENT OF GLUCOSE IN HUMAN CYTOTROPHOBLASTS

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Aims: The diabetic pregnancy is characterized by maternal hyperglycaemia and dyslipidaemia, such that placental trophoblast cells are exposed to both. The objective was to determine the effects of hyperglycaemia, elevated non-esterified fatty acids (NEFA) and their interaction on trophoblast cell metabolism and function. Methods: Trophoblasts were isolated from normal term human placentas and established in culture for 16 h prior to experiments. Glucose utilization, fatty acid oxidation and fatty acid esterification were determined using radiolabelled metabolic tracer methodology at various glucose and NEFA concentrations. Lipid droplet formation, cell aggregation, viability, proliferation and apoptosis and the secretion of hormones and pro-inflammatory cytokines were also assessed. Results: Glucose utilization via glycolysis was near maximal at the low physiological glucose concentration of 4 mM; whereas NEFA esterification into triacylglycerol (TG) and diacylglycerol increased linearly with increasing NEFA concentrations without evidence of plateau. Hyperglycaemia caused intracellular glycogen accumulation, but had no other effects on trophoblast metabolism or function. Culture of trophoblasts in 0.25 mM

NEFA for 24 h, however, upregulated fatty acid esterification processes, inhibited fatty acid oxidation, inhibited glycerol release (a marker of lipolysis) and promoted lipid droplet formation, all consistent with upregulation of fatty acid storage and buffering capacity. NEFA also promoted trophoblast aggregation and TNFα, IL-1β, IL-6 and IL-10 production without effect on cell viability, proliferation, apoptosis or hormone secretion. Conclusion: NEFA have effects on trophoblast metabolism and function, independent of glucose, that may have protective as well as pathophysiological roles in diabetic pregnancy.

009

FASTING GLUCOSE AND INSULIN PROFILES AMONG OBESE WOMEN IN PREGNANCY: DOES EXERCISE HELP?

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Introduction: Gestational diabetes mellitus (GDM) is a condition that affects at least 5-8% of pregnancies in Australia. While obese pregnant women are at an increased risk of developing GDM, the severity may be minimised or prevented through sufficient exercise during pregnancy. Using data collected from a pilot randomized controlled trial assessing the feasibility of an exercise program for obese pregnant women, we examined fasting insulin and glucose levels for obese women who did and did not meet the prescribed exercise requirements during pregnancy.

Subject: Fifty obese pregnant women who were receiving antenatal care at the Royal Brisbane and Women's' Hospital in Brisbane, Queensland.

Methods: Data were collected at five time points: 12, 20, 28 and 36 weeks gestation and 6 weeks postpartum. Antecubital venous blood samples were taken from the women to analyse fasting glucose and insulin levels. Exercise was assessed using the pregnancy physical activity questionnaire (PPAQ); RT3 triaxial accelerometers and exercise diaries and interviews. Women were classified as *Exercisers* or *Non-exercisers* based on a total score derived from combining data from all exercise measures.

Results: Women classified as *Exercisers* had lower levels of fasting insulin at 20 weeks gestation than *Non-exercisers* (9.71 ±3.70 vs. 12.73 ±5.04 mcU/mL, $p < 0.05$). In addition, fasting glucose was lower among the *Exercisers* at 28 weeks gestation than *Non-exercisers* (4.34 ±0.35 vs. 4.76 ±0.52 mmol/L, $p = 0.006$). Fasting glucose levels for the *Exercisers* remained relatively stable during pregnancy. However, there was large variability across the trial in glucose levels of the *Non-exercisers.*

Conclusion: Exercise may improve glucose tolerance and increase insulin sensitivity during pregnancy in obese women. Thus, obese women who are physically active during pregnancy may be at a reduced risk of developing GDM during pregnancy. Supporting and motivating women to become, and remain physically active during pregnancy may be necessary for preventing adverse maternal and neonatal outcomes of pregnancy.

010

EARLY GESTATIONAL GLUCOSE TOLERANCE TESTING IN WOMEN WITH A HISTORY OF GDM

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Up to 40% of women with a history of gestational diabetes (GDM) will develop GDM in a subsequent pregnancy. However it is unclear whether screening early pregnancy is useful. In our institution, a 75g glucose tolerance test (GTT) is performed at 12-16 weeks gestation in all women with a history of prior GDM (pGDM), in addition to the 28 week GTT.

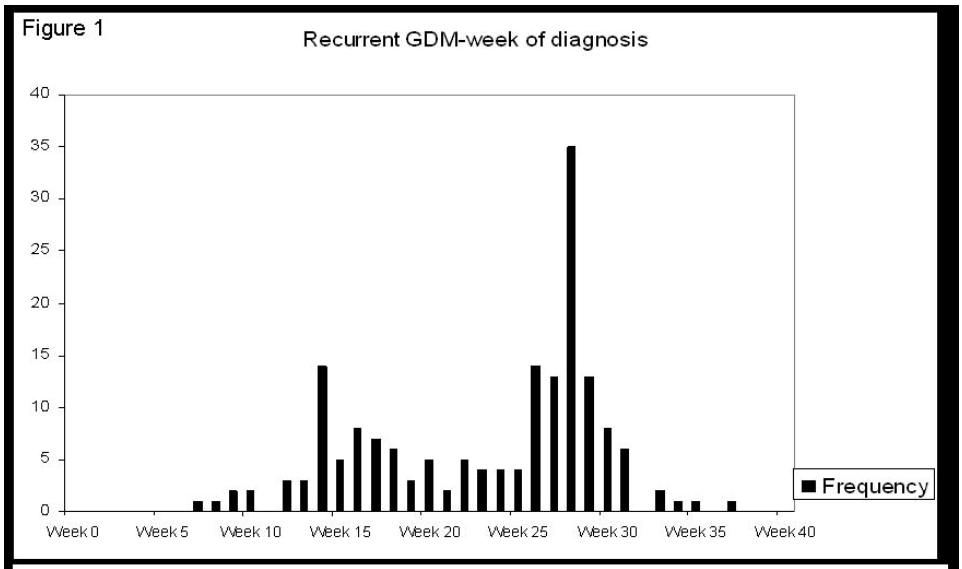
AIMS: To examine the value of an early gestational GTT in women with pGDM.

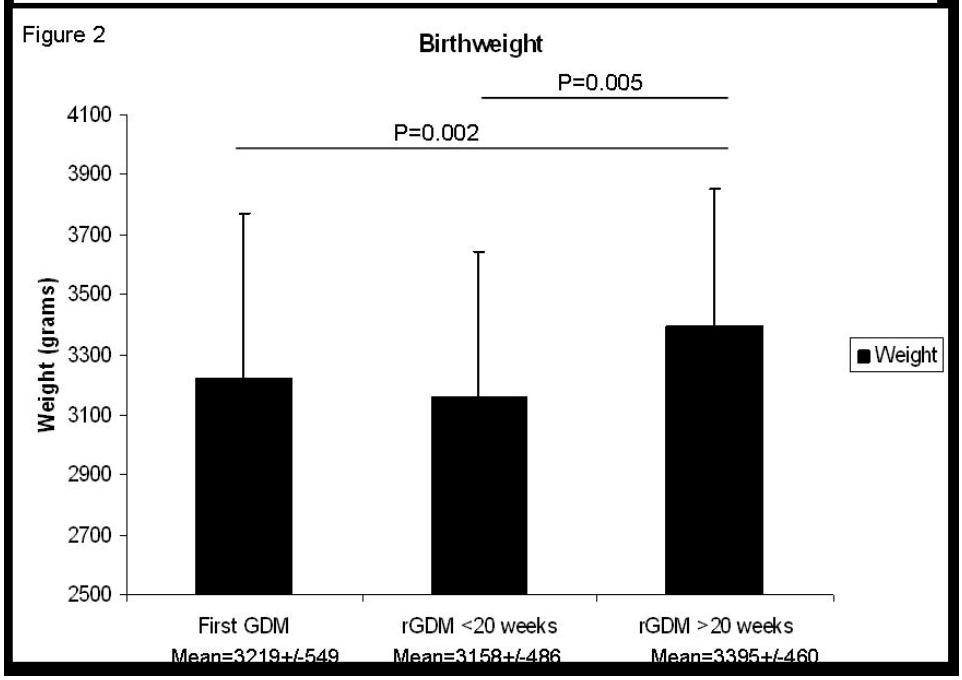
METHODS: Using our Obstet (2008-2009) and GDM (2002-2009) databases, we identified women with pGDM who then developed GDM again (recurrent GDM, rGDM). We compared outcomes in women with rGDM diagnosed before and after 20 weeks of gestation.

RESULTS: 528 women presented with pGDM over two years (6.3% of all pregnant women). 11.4% developed rGDM, and women with rGDM constituted 16.1% of all GDM women (n= 173/1075). Those women with rGDM were older and heavier

than those with first-time GDM (age 34.67+/- 4.67 versus 33.01 +/- 4.95 years, p<0.001; booking BMI 26.61+/- 6 versus 24.48 +/- 5.5 p 0.0004). 31% of women with rGDM were diagnosed before 20 weeks (Fig.1). They had greater insulin requirements than women with first-time GDM or with rGDM diagnosed later in pregnancy. Despite this, mean birth weight was similar to those with first-time GDM. In contrast, the mean birth weight was significantly greater with rGDM diagnosed after 20 weeks gestation compared to the other two groups (Fig.2) while gestational age at delivery was the same.

CONCLUSIONS: Recurrent GDM, diagnosed before 20 weeks, a third of all rGDM, was associated with similar birth weights compared with first-time GDM pregnancies, whereas rGDM diagnosed after 20 weeks was associated with heavier babies, suggesting a benefit of early detection of rGDM. However, only 5% with pGDM had a positive early gestational GTT, reflecting the low recurrence rate of GDM in our women. The early gestational GTT may be useful in populations with a high recurrence rate of GDM.





011

REDUCING THE RISK OF DEVELOPING TYPE 2 DIABETES AFTER GESTATIONAL DIABETES: A MODEL OF SYSTEM-LEVEL CHANGE

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Type 2 diabetes and gestational diabetes mellitus (GDM) are important and escalating problems worldwide. GDM is the strongest single population predictor of type 2 diabetes. At least 50% of women who have GDM will go on to develop diabetes. Randomised controlled trials in the US and Finland have shown that lifestyle intervention programs can reduce the risk of developing type 2 diabetes in adult populations.

There have also been successful implementation trials for diabetes prevention in Finland and Australia using a group format. Although these lifestyle modification programs are effective in delaying or preventing type 2 diabetes, no intervention programs have been designed specifically for women post-GDM. We propose a model of system change to reduce the risk of progression to diabetes post-GDM. This model implements a chronic disease management system with long-term follow-up for a high risk population. The model includes: screening and registering all women for gestational diabetes in hospital settings, recalling women from the GDM register to their GP for a check-up for diabetes status, implementing an intervention for lifestyle improvement, and linking to clinical and community care. This program has the potential to positively change the longer term health of women and their children.

012

PREGESTATIONAL DIABETES IN VICTORIA 1983-2007 HAVE WE MADE ANY PROGRESS?

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In the 25 years from 1983, 1,504,859 women have given birth in Victoria, 8684 of whom were identified in the PDCU of CCOPMM as having pregestational diabetes. The incidence over this period has varied little.

Despite a rise in the caesarean delivery rate from 42 to 63% (compared with those without diabetes of 15 to 30%) and a lengthening in the gestation at delivery from 68% to 80% delivering by 38 weeks and apparent improvements in antenatal and neonatal paediatric care, there has actually been a rise in the PNM from 24/1000 to 28/1000 total births cf no change for those without diabetes remaining at 12/1000.

Gross macrosomia –birthweight >95th centile- has risen from 20 to 26%, compared with those without diabetes where it has remained around the 5-6%.

There would appear to be little grounds for complacency.

013

EVALUATION SHOWS SUB-OPTIMAL PERFORMANCE OF BLOOD GLUCOSE METERS IN AN ANTENATAL DIABETES CLINIC

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Background: Portable glucose meters are routinely used for monitoring blood glucose levels (BGLs) in diabetic pregnancies (DP) and to commence or titrate insulin therapy. There is a lack of published guidelines and recommendations about the performance of glucose meters in DP. This together with recent changes to glucose strip enzyme technology prompted us to evaluate the accuracy of glucose meters in an antenatal clinic (ANC) against a laboratory comparative method.

Method: Finger prick BGLs were performed on 102 DP attending our hospital ANC using 6 different glucose meters (in duplicate) and compared with plasma glucose collected simultaneously on a laboratory multichannel analyser. HbA1c and haematocrit (HCT) were also measured.

Results: The plasma glucose range was 2.2-9.4 mmol/L with HCT 33-37% and mean HbA1c 5.5%. All meters were calibrated to provide plasma glucose results, except one which reported whole blood glucose and adjusted plasma values were calculated. Accuracy of each meter was evaluated against the laboratory method for plasma glucose. Bias% was calculated as = [(Meter - Lab Glucose)/ Lab Glucose] x100. Compared with the laboratory plasma glucose the absolute meter variations were mean±SD 0.232 ±0.69 to 0.725 ±0.62 mmol/L and Bias ranged from 6.4 to 15.8%. All meters failed to fulfil revised ADA (1996) performance goals of analytical error <5%. On error grid analysis all meters deviated substantially from these guidelines. When BGL was grouped by HCT Levels (< or ≥35%) we observed a significant difference ($p<0.05$) in BGL for 2/6 glucose meters at HCT < 35%.

Conclusion: Positive bias in plasma glucose values and HCT interference differentiate glucose meters, and minimisation of these deviations and correct agreement between laboratory and meter glucose is essential to help prevent over-treatment and dangerous hypoglycemia in insulin treated patients during pregnancy.

014

INTERNATIONAL DIABETES FEDERATION (IDF) GUIDELINES FOR PREGNANCY

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In 2005 the IDF published guidelines for type 2 diabetes which included a section on pregnancy. The series of IDF guidelines are being expanded to include, amongst other things, aspects of the diagnosis and management of gestational diabetes mellitus (GDM), type 1 diabetes and an upgrade of the type 2 recommendations. These guidelines will be released to coincide with the IDF meeting in Montreal 2009.

The background to the guideline was to review the available literature and evidence related to some of the controversial areas and from this review to develop a consensus approach that would be applicable in as many parts of the world as possible. A draft guideline was developed by a writing group and then forwarded to a number of international experts in this field. Their suggestions were incorporated into a second draft that was then forwarded by the IDF to all of its member associations. All suggestions and requests were considered and a final guideline was prepared.

The literature review for the guidelines was never intended to be a textbook. It was designed to examine and question some of the areas of controversy. For this reason some topics were dealt with in depth while others were referenced and assumed. The recommendations were a consensus and will challenge many areas of practice in many parts of the world.

POSTERS

021

A STRUCTURED PRE-PREGNANCY GROUP EDUCATION PROGRAM FOR WOMEN WITH TYPE 2 DIABETES MELLITUS

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This project was supported by a 2008 NovoNordisk Regional Support Scheme Grant.
BACKGROUND: Pregnancies in women with pre-existing type 2 diabetes mellitus (DM) are associated with an increased risk of complications including congenital malformations, miscarriage and perinatal mortality[1]. Each of these complications can be reduced by pre-pregnancy care.
AIM: The aim of this project was to develop and evaluate a structured pre-pregnancy group education program for women with type 2 diabetes mellitus.
METHOD: The program was adapted from the highly successful pre-pregnancy group education program for women with type 1 DM that has been running for several years at our hospital[2]. The program, which is conducted over 2 x 3 hour sessions, utilises interactive problem-solving and the motivation and support derived through group dynamics. The emphasis is on the practical aspects of blood glucose and weight management, with specific content including carbohydrate counting, exercise and insulin dose adjustments. A structured approach to evaluation of the program has been developed.
RESULTS: The results of the pilot program will be presented, including process and outcome evaluations. In addition, the difficulties encountered in recruiting participants, and possible recruitment strategies, will be discussed.
CONCLUSION: The importance of pre-pregnancy care is as important in type 2 DM is it is in type 1 DM. The characteristics of this patient group and their more limited contact with specialist diabetes services create particular difficulties with recruitment and engagement.

(1) McElduff A, Cheung NW, McIntyre HD, Lagström JA, Oats JN, Rodd GP, et al. The Australasian Diabetes in Pregnancy Society consensus guidelines for the management of type 1 and type 2 diabetes in relat
(2) Conn JJ, Nankervis AJ, Roem K, Aylward A, Oats J, Harrison N, Dodds A. A Structured Pre-Pregnancy Education Module for Women with Type 1 Diabetes Mellitus. Proc ADIPS 2007.

022

OPTIMAL MATERNAL WEIGHT-GAIN ACCORDING TO PRE-PREGNANCY BMI IN WOMEN WITH GESTATIONAL DIABETES MELLITUS

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Background: Gestational diabetes mellitus[GDM] is a well recognised cause of large for gestational age[LGA] infants. However, pregravid overweight and obesity, and excessive maternal weight-gain are also associated with risk of LGA. There is evidence that optimal weight-gain in women without GDM, differs according to pre-pregnancy BMI[1]. However there is less evidence available on optimal weight-gain range recommendations in women with GDM. Preventing excessive weight-gain must be balanced against the risk of small for gestational age[SGA].

Aim: To identify optimal weight-gain ranges according to pre-pregnancy BMI, which minimise risk of both LGA and SGA birthweight, in women with GDM.

Methods: Data were analysed from a computerised database, for singleton births in women with GDM diagnosed by ADIPS criteria since 1994. Exclusions were: incomplete data, delivery <36 weeks gestation and/or where the last recorded clinic weight was >4 weeks before delivery. Data assessed were: pre-pregnancy BMI [based on self-reported weight] and total maternal weight gain. Data were analysed according to pre-pregnancy BMI categories [<20; 20-24.9; 25.0-29.9; 30-34.9; 35.0+kg/m2], and total maternal weight-gain in the following categories: ≤10, 10-15 and 15+ kgs.

Results: Amongst 1698 women, with increasing pre-pregnancy BMI, there was an increasing proportion of LGA and a decreasing proportion of SGA. The amount of weight-gain within each BMI category resulted in a greater [or less] LGA/SGA proportion respectively [See Figures 1&2]. These trends for LGA and SGA across pre-pregnancy BMI categories were all statistically significant.

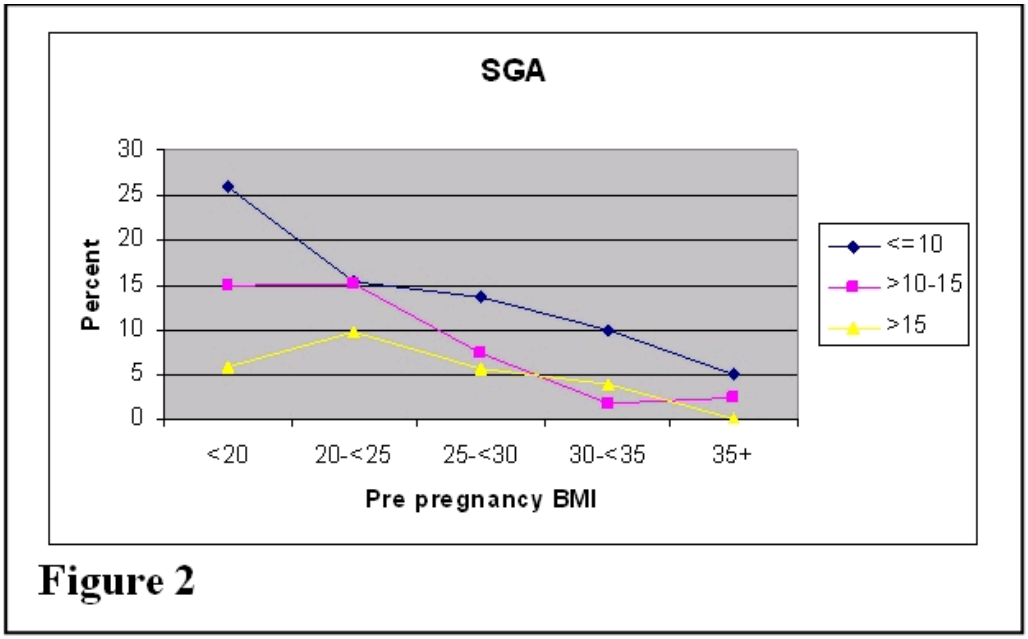

Figure 2

Conclusions: Conventional GDM treatment concentrates on management of blood glucose levels. The trends identified here stress the need to also address weight gain in association with pre-pregnancy BMI. Overweight and obese women require less total weight gain to achieve appropriate birthweight. Conversely, women with a pre-pregnancy BMI <20kg/m2 need to gain more weight to prevent SGA. Determining specific optimal weight-gain range recommendations, however, requires further research.

(1) Marie I Cedergren. Optimal gestational weight-gain for body mass index categories. Obstet Gynecol 2007; Vol 110(4): 759-764.

023

CONCERNS REGARDING ASSISTED CONCEPTION IN OBESE INDIVIDUALS

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There is a clinical impression that obese individuals requiring assisted conception might have pregnancies resulting in even higher rates of adverse outcomes. We reviewed all deliveries in obese individuals at Blacktown, Westmead and Hawkesbury Hospitals during an 18 month period to December 2008. Obesity was defined as a body mass index (BMI) >30 at the booking antenatal visit. There were 3631 deliveries to obese women after spontaneous conceptions, and 131 deliveries to obese women after either induction of ovulation or IVF.

Women in the assisted conception group were older (32 years vs 30 years, P=0.0005) but with similar body mass indices (36.1 vs 35.4, NS). This group had higher rates of pregnancy hypertension (16% vs 10.2%, P=0.028), and caesarean section (43.5% vs 34.3%, P=0.03). Stillbirth rates trended higher (1.5% vs 0.7%) but did not achieve statistical significance (P=0.07). The rates of gestational diabetes were very high in both assisted conception (13%) and spontaneous conception groups (10.6%) although the difference between them did not reach significance.

In multiparas, there was a large increase in rates of preeclampsia and renal hypertension (7.1% vs 2.8%, P=0.038).

There is therefore some evidence that ovulation induction or IVF in obese women may produce increases in adverse outcomes, even when compared to other obese individuals. We are uncertain as to whether this is due to the age difference between our two groups, or whether sub-fertility in obese women is a marker of a more severe metabolic derangement which then translates into more dangerous pregnancies. Naturally we acknowledge that sub-fertility is very complex and that other factors may influence pregnancy outcomes.

Based on these findings, we are planning a much larger review of spontaneous versus assisted conceptions in the whole of Sydney West Area, for obese and non-obese individuals.

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024

VITAMIN B12 LEVELS IN PREGNANCY FOLLOWING METFORMIN USE

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Objective: To determine if there is a relationship between maternal vitamin-B12 concentrations and Metformin use in pregnant women attending Endocrinology clinics at Westmead and Nepean Hospitals from August 2007 to August 2009.

Design: Audit of hospital data for pregnant women with pregestational diabetes tested for vitamin-B12 concentrations during pregnancy. Those who had not been treated with Metformin served as a control group.

Main outcome measures: Patient characteristics (age at conception, ethnicity and morbidity profile), details of Metformin use, vitamin-B12 concentration during pregnancy, red blood cell indices.

Results: Between 2007 and 2009, 42 pregnant women with pregestational diabetes were identified to have vitamin-B12 levels tested. The mean age was 32±5, and the B12 levels were measured 17±10 weeks into the pregnancy. 24 pregnant women had a history of Metformin use (ceased mean 6±6 weeks at the time of B12 testing) and 18 women did not. Vitamin-B12 concentrations in pregnant women with Metformin use was 216±150 and in pregnant women without Metformin use was 247±91, p=0.098 by Mann-Whitney U test. Five women with a history of Metformin use were vitamin B12 deficient (normal: 125-780 pmol/L) compared to one women amongst those who did not (p=0.21 by chi square analysis).

Conclusion: We observed a trend toward lower vitamin-B12 levels in pregnant women with Metformin use. It would be prudent to check vitamin-B12 levels and ensure adequate supplementation if required in pregnant women with a recent history of metformin use.

025

PHYSICAL ACTIVITY, PREGANCY AND GESTATIONAL DIABETES: MORE ATTENTION NEEDED TO SUPPORT WOMEN TO BE ACTIVE DURING PREGNANCY

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Results from a mixed methods study which explored physical activity in relation to pregancy and gestational diabetes were that women reported that little attention was given to physical activity during pregnancy by their health care providers. However after a diagnosis of GDM this did increase. 112 women participated in surveys. One third of these women experienced GDM. The most common physical activity reportedly undertaken by women before pregnancy, at all stages of pregnancy and then after the baby was born was walking at a slow pace.Women were asked about factors that helped and hindered their participation in physical activity which mainly related to social, relationship and physical factors.. Women who had GDM participated in interviews and reported concerns over lack of follow-up post-partum. The results of this research informed the preliminary development of a model of care which directs more attention to lifestyle factors to enourage pregnant women's participation in physical activity.Potentially this could be incorporated into the emerging role of a health promotion lifestyle practitioner or a practice nurse.

026

MATERNAL SERUM 25-HYDROXYVITAMIN D CONCENTRATIONS AND THE ASSOCIATION OF GESTATIONAL DIABETES MELLITUS.

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[2]Obstretrics & Gynaecology, Westmead Hospital, Westmead, NSW, Australia

Aims: Vitamin D deficiency has been implicated in the pathophysiology of insulin resistance and impaired glucose tolerance in pregnancy. A previous Australian study[1] has demonstrated that maternal serum 25OHVit D concentrations are inversely related to fasting glucose and mothers with serum 25OHD concentration <66nmol/L are more likely to have gestational diabetes (GDM). Our objective is to explore the association between maternal serum 25OHD concentrations in early pregnancy and the risk of gestational diabetes mellitus (GDM).

Methods: A retrospective study of serum 25OHD and random plasma glucose concentrations were performed in 595 singleton pregnant women who attended antenatal clinic between December 2007 and April 2009. Serum 25OHD status in early pregnancy (median 12.5+5.6weeks (SD)) was correlated with the 24-28 week 50g glucose challenge test (GCT) in 520 women and 75g formal oral glucose tolerance test (oGTT) in 234 women. Kruskal-Wallis analysis was used for univariate linear relationship between serum 25OHD and serum glucose and other variables. GDM was diagnosed as per ADIPS criteria.

Results: The mean serum 25OHD concentration in early pregnancy was 50+/-23nmol/L(SD) and this was similar in both categories of women who were euglycaemia or later developed GDM. Serum 25OHD was <50nmol/L in 311(52%) women and a serum 25OHD <25nmol/L in 90(15%) women. 547(91%) women proceeded to have a GCT +/- oGTT. Of those who had an oGTT, 17% (40/234) had GDM. There was no correlation between serum 25OHD and plasma glucose concentrations as continuous variables in linear regression models. When serum 25OHD concentration was dichotomised to =/<50nmol/L and >50nmol/L, there was no association with GCT or oGTT. However, when serum 25OHD concentration was dichotomised to =/<70nmol/L and >70nmol/L, there was a weak association with GCT (median 7.7mmol/L vs 7.1mmol/L, pv=0.03) but no correlation with fasting oGTT or 2hr oGTT.

Conclusions: There is a weak association between maternal serum 25OHD in early pregnancy and elevated glucose on GCT in later pregnancy.

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027

TWO CASES OF EUGLYCAEMIC KETOACIDOSIS IN PREGNANCY

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We describe two cases of gestational "starvation" ketoacidosis.

Case1: A 28year old, G1P0 was admitted with placental praviae at 28-week gestation. She has a history of PCOS, depression, steroid-dependent rheumatoid arthritis (5mg prednisone/day) and recently diagnosed gestational diabetes. Insulin was initiated, but requirements were low due to poor appetite. At week 34 she developed gastroenteritis. Her insulin doses were withheld as she was not tolerating meals and her glucose levels were within target range. After four days of acute illness, she developed metabolic acidosis (pH 7.2, bicarbonate 11, anion gap 13mol/l), heavy ketonuria but absent glycosuria with glucose of 5mmol/L. She was commenced on an insulin/dextrose infusion. She delivered by emergency caesarean section without neonatal complications and maternal acidosis was corrected. Post partum OGTT was normal.

Case 2: A 24year old, G3P0 with intellectual delay presented with severe respiratory distress at 36-week gestation. She had not regularly attended antenatal care and her diabetes status was unknown. There had been poor oral intake and persistent hyperemesis during the pregnancy. On presentation, a high anion gap metabolic acidosis was noted (pH 7.1, bicarbonate 5.7, lactate 0.84, anion gap 33). Blood ketone was 5.4 mmol/L and glucose 9mmol/L. An insulin/dextrose infusion was commenced with resolution of ketoacidosis and subcutaneous insulin therapy was initiated. She delivered at week 38, complicated by neonatal hypoglycaemia. OGTT just prior to delivery showed fasting glucose of 6.5 mmol/L and 7.0 mmol/L at 2-hours. P ost partum OGTT was normal.

Conclusion: Pregnancy *per se* is a diabetogenic state characterised by insulin resistance and accelerated lipolysis. Pregnant women are particularly prone to ketogenesis in late gestation and protracted poor oral intake may lead to life threatening

ketoacidosis in absence of overt hyperglycaemia. Mainstay therapy is intravenous glucose supported by insulin to facilitate glucose uptake.

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(10)

028

LIFE AFTER GESTATIONAL DIABETES: REDUCE YOUR RISK OF DIABETES…

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Women who have had gestational diabetes (GDM) are at high risk of developing diabetes mellitus later in life1. Lifestyle measures: healthy eating, regular exercise, and weight control have been shown to be beneficial in minimizing risk. Regular screening for diabetes is vital. However, Australia has no National Program or resources to provide advice and empower women following GDM. In recognition, representatives from the Australian Diabetes Society (ADS), Australian Diabetes Educator Association (ADEA) and the Australasian Diabetes in Pregnancy Society (ADIPS), with an expert in health promotion and a consumer representative, formed a working party to produce such a resource. Funds were obtained by an ADS-NDSS initiative grant. The resource development process included: 1) Collation and critique of existing resources from members of ADS, ADEA and ADIPS; 2) Utilising presented materials to guide resource development; 3) Testing the material in consumer focus groups; 4) Consultation with Diabetes Australia (National and State bodies). With regard to the resources, the following principles were implemented: 1) The material had to be user friendly, with accurate (but not overwhelming) information, based on health promotion principles; 2) The resource/s had to be visually appealing; 3) Durability of the material was required, for long lasting effect, and 4) Provision of a mechanism for women to obtain more information if they so desired. The result: A 16 page booklet and fridge magnet will be distributed through the NDSS. Resources will be sent with the exit letter to women a year after initial GDM registration with the NDSS. Additional resource material will be available on the NDSS website. A cross sectional mail survey pre- and post- distribution of the resource has commenced; to evaluate the effectiveness of the resource material.

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029

THE BENEFITS OF FREESTYLE NAVIGATOR ™ IN PREGNANCY

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Introduction: LH is a 28 year old lady with type 1 diabetes since age 5, who is legally blind due to severe diabetic retinopathy. She presented to the Diabetes Pregnancy service at 12 weeks gestation, G2 P1, with an HbA1c of 8.7%. In her previous pregnancy she had experienced severe hypoglycaemia so as a precaution she was fingerpricking up to 15 times per day to detect hypoglycaemia.

Management: LH was selected for the Freestyle Navigator™ familiarisation trial to determine any benefits of continuous glucose monitoring in pregnancy over a period of 12 weeks.

Results: She was able to manage the Freestyle Navigator™ and see the display using a magnifier. Guided by the inbuilt alarms and detailed graphs of glucose trends she was able to predict and prevent severe hypoglycaemia, then act to prevent marked and recurrent glyacemic excursions. She retained her independence, reduced her anxiety and was able to achieve her target range whilst using the device. Freestyle Navigator™ provided the benefits of reduced fingerpricking to 4 times over 5 days as required for calibration and an improvement in her HbA1C from 8.7% to 6.5% during the trial. Her confidence improved particularly in detecting hypoglycaemia, her ability to self manage her diabetes also improved. Results indicated her glucose level was in the normal range the majority of the time. At 38/40, LH delivered a healthy baby girl, weighing 3.4kg. The baby was observed in Special Care for less than 24 hours. LH stated she would prefer to continue using the Freestyle Navigator™ long term but she identified the ongoing costs to her would probably be prohibitive.

Recommendations: The Freestyle Navigator™ is a device highly recommended for management of type 1 diabetes in pregnancy, to improve control, provide independence and reduce the complications of diabetes in pregnancy.

030

PERCEPTIONS OF WOMEN FOLLOWING THE DIAGNOSIS OF GESTATIONAL DIABETES MELLITUS (GDM)

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Introduction: Women with GDM have a high risk of developing type 2 diabetes (Bellamy 2009)[1] and are encouraged to make lifestyle changes for prevention, when highly motivated during pregnancy. Previous studies have suggested women with histories of GDM usually do not perceive themselves to be at elevated risk. *(Kim 2007)*[2]

Aim: To determine their perceptions of diabetes and readiness to change in women following the diagnosis of GDM.

Method: In 2008, over a 9 month period, women presenting to the GDM clinic were surveyed at their initial visit, before attending a lifestyle modification session. The survey included questions on previous knowledge of diabetes, initial feelings, risk perception, lifestyle and readiness to change.

Results: Surveys were completed by 171, English speaking women, 64% indicated a prior knowledge of diabetes. 74% indicated they were worried or stressed, 26% were angry or sad, 21% indicated disbelief, but 29% accepted the diagnosis and only a few were disinterested.

The long term benefits of healthy eating and exercise was recognised (86%), but some thought either healthy eating or exercise alone was sufficient (20%). 60% recognized they were at high risk of type 2 diabetes but 40% thought at low or no risk. Some women were thinking about making change whilst the majority of women recognized they were at risk of diabetes and ready to make changes in a time of stress and worry.

Conclusion: Although some studies have shown women do not perceive themselves to be at elevated risk, these women indicated they were worried and in a time of stress were ready to make lifestyle changes. This presents an opportunity for health professionals to provide support and offer lifestyle intervention programs to reduce the risk of type 2 diabetes.

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031

THE RELATIONSHIP BETWEEN SOCIODEMOGRAPHIC CORRELATES AND BODY MASS INDEX IN TYPE 1 AND 2 PREGESTATIONAL DIABETES: THE EFFECTS ON PREGNANCY OUTCOMES.

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Introduction: Maternal obesity has been shown to have adverse neonatal outcomes,and low socioeconomic status is an established risk for both obesity and diabetes. However, it is unknown if obesity and socio-economic status are major factors contributing to the adverse outcomes seen in diabetic pregnancy.

Aims: The primary objective was to evaluate the relationship between sociodemographic influences and BMI in type 1 and type 2 diabetic pregnancies.

Methods: Patients with type 1 and type 2 diabetes mellitus who were pregnant were identified from a obstetrics databases from the period 1996-2008 at three tertiary hospitals. Information regarding the pregnancies was obtained from the obstetrics databases and medical records. Parameters evaluated included clinical parameters , the sociodemographics of the patient as calculated by the SEIFA score,first trimester HbA1c and serious adverse neonatal outcomes (defined as fetal malformations and death) correlated to BMI.

Results: A total of 364 diabetic pregnancies were identified, 184 with type 1 diabetes and 180 with type 2 Diabetes. Of the self reported BMI n=300, 63 patients had BMI>30kg/m^2. Of these 11 (17%) patients had Type 1 diabetes and 53 (83%) patients had Type 2 diabetes($p<0.01$).The median SEIFA score was 1000. Those with SEIFA scores below the median had a higher BMI, 35% compared with 10% in the higher socioeconomic advantaged suburbs, ($p<0.001$). There were 6 fetal deaths and 15 severe malformations. Factors associated with serious adverse outcome were determined by the tertiary centre ($p<0.01$), ethnic group($p<0.01$), folate use preconception ($p<0.01$) and whether they had an endocrinology review prior to conception ($p<0.05$). There was however, no correlation between either obesity or SEIFA score with serious adverse neonatal outcomes and HbA1c in the first trimester.

Conclusion: Obesity is common in pregnant women with type 2 diabetes but we did not find an association between either obesity or socio-economic status with adverse pregnancy outcomes.

032

POST-PARTUM ATTITUDES AND OPTIONS FOR FOLLOW-UP OF WOMEN WITH GESTATIONAL DIABETES MELLITUS

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Background: Gestational Diabetes Mellitus[GDM] identifies a woman at-risk of future type 2 diabetes[T2DM]. We routinely arrange a follow-up Oral Glucose Tolerance Test[OGTT] appointment eight-weeks post-partum, with previously, a consistent 60-70% return rate. Database review of women seen in 2004-2005 however, revealed significantly poorer attendance by Anglo-Celtic and Arabic background women [56.2% and 58.2% respectively].

Aim: To assess and address barriers to post-partum OGTT attendance.

Method: Clinic database audit identified a sample of Anglo-Celtic and Arabic background GDM women who failed to attend follow-up OGTT in 2004-2005. They were invited [by mail and telephone] to discuss attitudes to GDM risk factors. A brief knowledge and attitudes questionnaire was developed and administered to determine understanding of future T2DM risk and perception of its relevance to each woman. Analysis aimed to establish the most appropriate educational strategy for promoting positive health choices, including attendance at follow-up OGTT. Educational information and reminders were developed, translated, implemented then evaluated by assessing rates of post-partum OGTT attendance March 2008-March 2009.

Results: Women found “having diabetes” a negative experience, were aware of diabetes risk later in life, but were “too busy with a new baby” for a two hour test. Many wanted a reminder about the test. Information about being tested was developed and a reminder service commenced and applied to the whole clinic, with letters sent 2 weeks prior to OGTT. All documents were translated into Arabic, Vietnamese and Chinese. The Table shows result details:

2008-2009 Groups	Percentage completing OGTT	
	2008-2009[12mths]	2004-2005[24mths]
All women[n=226]	61.9%	60.0%
Anglo-Celtic[n=38]	64.1%	56.2%
Arabic[n=65]	65.2%	58.2%
Vietnamese[n=56]	71.9%	75.9%
Chinese[n=13]	38.5%	80.9%

Conclusion: No one strategy will address the complex problem of post-partum diabetes screening, however our new reminder system has increased attendance by women from Anglo-Celtic and Arabic background. Reduced attendance by Chinese women may relate to small numbers.

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