INDEX

ORGANISING COMMITTEE

ORGANISING COMMITTEE

Associate Professor Aidan McElduff

Dr Glynis Ross, President ADIPS

CONFERENCE SECRETARIAT

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DELEGATE INFORMATION

THE ORGANISER'S OFFICE – ASN EVENTS

The organiser's office and registration desk will be located on the Bayside Ground Level Foyer. The registration desk will be open on Friday 3rd September from 8:00 AM to 6:00 PM and on Saturday 4th September from 8:00 AM – 5:00 PM. Please see maps on Page 4.

The Conference office hours are:

Friday:	8:00am – 6:00pm
Saturday:	8:00am – 5:00pm

WHAT YOUR REGISTRATION INCLUDES

Delegate and student registrations include:

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

SOCIAL PROGRAM

Conference Dinner: The Conference Dinner (Friday 3rd September) will be held from 7.00pm – 10.30pm at the Marigold Citigate Restaurant. Level 4 & 5, 683-689, George Street,Sydney.Dinner tickets can be purchased in advance for $75 per person.

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Speaker Preparation

Presentations are to be loaded direct to PC in the room in which the speaker is presenting. Please make sure you have loaded your talk at least 15min-30min before your session begins.You should bring your talk on a USB, saved in a format for display on a pc within the room. A technician will be on hand to assist with any transfer / loading issues and to help you check your presentation. Please note there are no Macintosh computers in the presentation rooms.

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DISPLAYING YOUR POSTER

The Eli Lilly Poster Session is being held from 12.30pm - 2.00pm on Saturday 4th September in room Bayside 204. Posters will be displayed only on the day of your poster session in the Bayside 204. 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.

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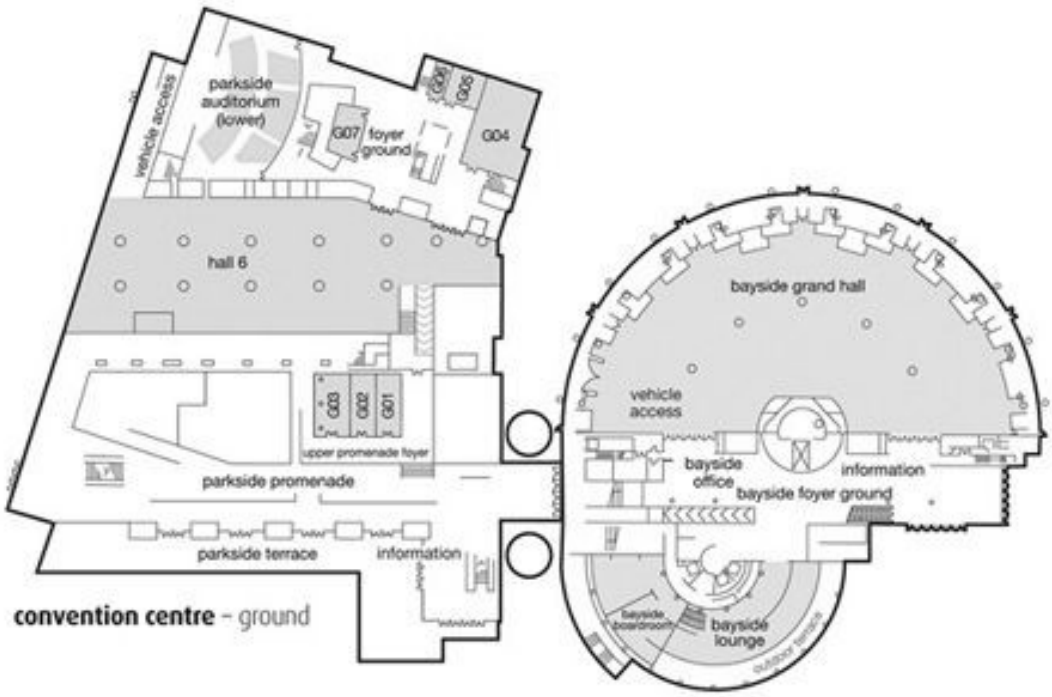
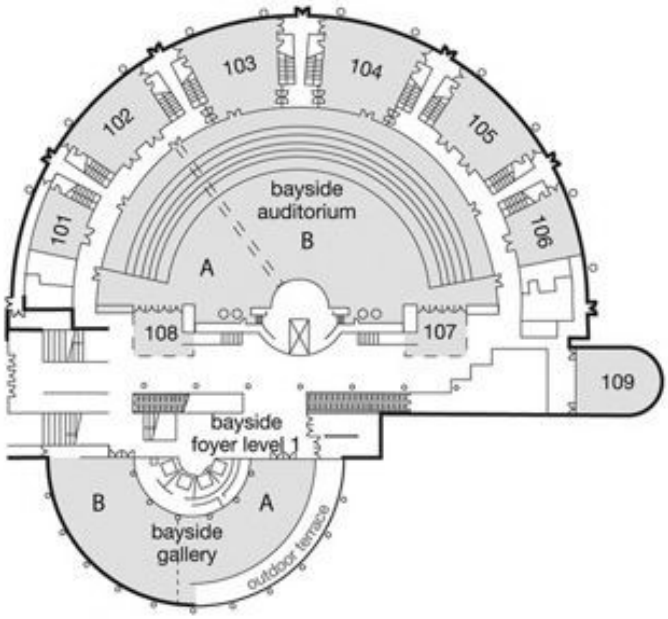


convention centre – ground



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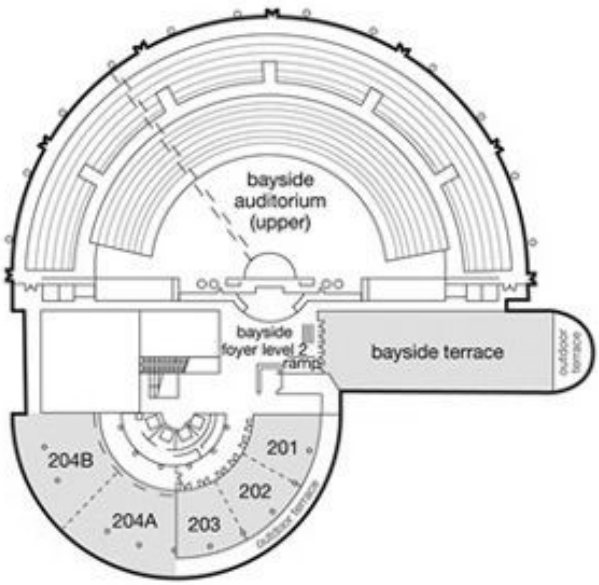

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SPEAKERS

Prof. Dr. Ute Schaefer-Graf

Prof. Schaefer-Graf is chairwoman of the German Diabetes and Pregnancy Study Group since 2001 and since this time she leads expert groups to create guidelines for the care of pregnant women with diabetes and their newborns. She finished her training in obstetrics and gynecology in Berlin, followed by a research fellowship in Los Angeles with the group of Buchanan und Kjos. Back in Berlin, she got a 4-year research grant from the Humboldt University and achieved an appointment as Associate Professor. Early in her career she started to specialise in diabetes and pregnancy and recently she finished her second specialisation as diabetologist. Her major research is fetal growth in diabetic pregnancies, new treatment strategies in GDM and long-term outcome of the children after diabetic pregnancy. Her participation and involvement in international scientific events and projects resulted in an election as member of the European DPSG and the DPSG-West of the USA. Currently she is appointed as consultant for high-risk pregnancies at the department for obstetrics and gynecology of the St. Joseph Hospital in Berlin and program director of the Berlin Center for Diabetes and Pregnancy.

Susan Clarke

Professor Susan Clark has a highly acclaimed international reputation for her pioneering work in mammalian cancer epigenetics. Susan currently heads the epigenetics research program at the Garvan Institute of Medical Research in Sydney, Australia. After completing a BSc (Hons1) in Biochemisty at ANU, she moved to University of Adelaide and graduated with a phD in Biochemistry in 1982. After ten years in the Biotechnology Industry she returned to basic research in gene regulation in 1992, at Royal Prince Alfred Hospital, Sydney. Her studies over the last eighteen years have initiated profound questions about the importance of epigenetics in early development and in disease, especially in cancer. She has made extensive ground-breaking discoveries relating to DNA methylation patterns in normal and cancer genomes, that have led to new tests for early cancer detection. The techniques she pioneered in the early 1990s, including bisulphite sequencing, have revolutionised and now underpin a new era in epigenetics research. Dr Clark has a number of awards including the RPAH Research Medal in 2002, Julian Wells Medal in 2003, Ruby Payne-Scott Award for contribution of women in science in Australia; “Biochemisch Analytik Preis” for outstanding contribution for Methylation analysis in 2004 and in 2006 was elected a Fellow of the World Technology Network for Biotechnology

Jeff Flack

Associate Professor, MBBS FRACP MM

Head, Department of Diabetes and Endocrinology; Director,Diabetes Centre Bankstown-Lidcombe Hospital, and a former President of the Australian Diabetes Society.

A/Prof Flack’s main area of clinical research interest has been Information Technology applications, [especially Data sets and Quality Audit initiatives], involving Diabetes Data collection, analysis and reporting. He developed [with Professor Stephen Colagiuri] the Australian National Diabetes Information Audit and Benchmarking initiative, [ANDIAB]. He has over 20 years experience with an in-house computerised database - Electronic Medical Record, with a large Pregnancy in Diabetes component.

Ash Gargya

Dr Ash Gargya, Staff Specialist, Bankstown-Lidcombe Hospital

Honorary Visiting Medical Officer, Royal Prince Alfred Hospital

Particular clinical interest in thyroid disease and endocrine disorders in pregnancy.Co-ordinates the antenatal thyroid service at RPAH.

Aidan McElduff

Doctor McElduff is an endocrinologist in part-time private practice. He has a particular interest in endocrine problems in pregnancy.

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David McIntyre

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. His research and clinical interests cover medical disorders of pregnancy, regulation of fetal growth and intensive therapy of Type 1 and Type 2 diabetes. Recent research studies have examined the effects of obesity and hypertensive disorders of pregnancy on immediate and later maternal and infant health. David was Principal Investigator for the HAPO study at the Mater site and leads the Mothers and Babies research theme at the Mater.

David is a previous President of the Australasian Diabetes in Pregnancy Society (2002 – 2006) and is currently Vice President of the International Association of Diabetes in Pregnancy Study Groups. He has been closely involved in IADPSG attempts to translate the HAPO study results into an internationally accepted definition of abnormal glucose metabolism in pregnancy.

Jonathan Morris

Jonathan Morris is Professor of Obstetrics and Gynaecology at the University of Sydney's Northern Clinical School. He has an active clinical and research interest in high risk pregnancies, their complications, prediction and prevention. He is Head of Perinatal Research at Northern Clinical School, which includes 30 researchers that encompass basic science, clinical and population health research.

Chris Nolan

Christopher Nolan (BMedSci, MBBS, PhD, FRACP) is a physician/scientist working in diabetes. He is an Associate Professor at the Australian National University Medical School and a Senior Specialist in Endocrinology in Canberra. He is the immediate past president of the Australasian Diabetes in Pregnancy Society. He has contributed to Australian and International consensus statements in the field of diabetes in pregnancy.

In addition to clinical and teaching duties in Canberra, he directs an active diabetes research laboratory focussing on (i) islet beta-cell failure in type 2 diabetes and gestational diabetes, (ii) non-alcoholic fatty liver disease and (iii) placenta in diabetic pregnancy. He is involved in diabetes-related International clinical trials. He has on-going research collaborations in Australia and in Canada (Montreal Diabetes Research Centre).

Glynis Ross

Dr Glynis Ross, Visiting Medical Officer in Endocrinology, Royal Prince Alfred Hospital, Sydney, and part-time Senior Staff Specialist in Endocrinology at Bankstown-Lidcombe Hospital, Sydney.

Glynis is the current President of the Australasian Diabetes in Pregnancy Society, and has been an ADIPS Council member from 1994-2000 and 2004-currently. She runs the multidisciplinary diabetes in pregnancy service at Royal Prince Alfred Hospital in Sydney.

Her particular clinical interests are in diabetes and other endocrine disorders in pregnancy, intensive management of Type 1 diabetes and insulin pump therapy. She also has extensive experience as Principal Investigator and Co-Investigator in diabetes clinical research trials, mostly international and multicentre, including several related to diabetes and pregnancy.

Janet Rowan

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.

PROGRAM

Friday, 3 September 2010

Registration
8:00 AM - 9:00 AM — Bayside Rego Desk

Session One

ADS/ADIPS symposium:
9:00 AM - 10:30 AM — Bayside 204

9:00am **Glynis Ross**
The New IADPSG Criteria for the Diagnosis of Diabetes: Background and Proposed Clinical Pathways.

9:15am **Jeff Flack**
The New IADPSG Criteria for the Diagnosis of Diabetes: Implications

9:30am **Aidan McElduff**
Women with a past history of gestational diabetes (GDM) are a potential target for interventions to promote long-term health

10:00am **Chris Nolan**
Oral Agents in GDM – Yes or No **?**

Morning Tea
10:30 AM - 11:00 AM — Bayside 204 A

ADIPS Symposium
11:00 AM - 12:00 PM — Bayside 104

411:00am **Ash Gargya**
Thyroid Disease and Pregnancy

11:30am **Susan Clark**
Genetics & Epigenetics: Nature versus Nurture Discovery of layers of change in the cancer genome

ADS/ADIPS Lecture
12:00 PM - 1:00 PM — Auditorium B

Prof. Dr. Ute Schaefer-Graf
Longterm outcome of newborns from diabetic pregnancies: role of intrauterine versus postnatal environment

Lunch
1:00 PM - 2:00 PM — Bayside 204 A

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Session Two

Friday Free Communications
2:00 PM - 3:30 PM Bayside 204

2:00pm **Dinesh Garg**
The Diagnosis of GDM, by the ADIPS and IADPSG Criteria

2:15pm **Jeff Flack**
Twin Pregnancies In Women With Gestational Diabetes: Retrospective Review 1993-2009

2:15pm **Cynthia Porter**
Potential exists to decrease the still birth rate for infants born to Aboriginal women with diabetes in pregnancy using a systematic approach.

2:30pm **T Payne**
Different Meter, Different Insulin Requirement In GDM Women

2:45pm **Flora Ip**
The effect of degrees of obesity on treatment and outcome of gestational diabetes mellitus

3:00pm **Jessie George**
Postnatal management of gestational diabetes : Barriers and Bridges.

Afternoon Tea
3:30 PM - 4:00 PM Bayside 204 A

The Early Diagnosis of Diabetes in Pregnancy
4:00 PM - 5:00 PM Bayside 204

4:00pm **David McIntyre**
Detection of Overt Diabetes in Pregnancy – IADPSG recommendations and beyond

4:30pm **Janet Rowan**
Early Diagnosis of GDM – an Auckland perspective

Council
5:00 PM - 7:00 PM Bayside 204

Dinner
7:00 PM - 10:00 PM Off-site restaurant

Session Three

9:00 AM - 10:30 AM — Bayside 204

9:00am **Prof. Dr. Ute Schaefer-Graf**
Individualized intensity of GDM therapy

10:00am **Jonathan Morris**
Pre-eclampsia

Morning Tea

10:30 AM - 11:00 AM — Bayside 204 A

Saturday Free Communications

11:00 AM - 12:00 PM — Bayside 204

11:00am **Robyn Barnes**
Weight-Gain Before Gestational Diabetes Mellitus Diagnosis: How Many Women Gain Too Much?

11:15am **Zoe Stewart**
A comparison of weight gain in late pregnancy in women with and without GDM

11:30am **Anna Lih**
The Pregnancy-Obesity epidemic: Is Obesity an important risk in pregnancy and neonatal outcomes?

11:45am **Elizabeth Johnson**
Reduction in Neonatal Intensive Care Unit (NICU) admissions as a result of using an effective AUDIT TOOL

AGM

12:00 PM - 12:30 PM — Bayside 204

Session Four

Lunch and Posters

12:30 PM - 2:00 PM — Bayside 204

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Management issues incl glycaemic targets and weight gain

2:00 PM - 4:00 PM — Bayside 204

Leonie Callaway and Janet Rowan
Glycemic Targets in Gestational Diabetes and Neonatal Adiposity: Still missing the mark?

Conclusion

4:00 PM - 5:00 PM — Bayside 204

We take diabetes personally.

Lilly Diabetes

Each person living with diabetes faces individual challenges that require individual solutions. We not only understand that, we're doing something about it. We're committed to providing healthcare professionals and their patients the treatments, tools, education, and support they need to make the journey a successful one. One person at a time.
Your journey inspires ours.

ABSTRACTS

ORALS

001

THE NEW IADPSG CRITERIA FOR THE DIAGNOSIS OF DIABETES

G. P.Ross

Diabetes Centres, Royal Prince Alfred Hospital Camperdown and Bankstown-Lidcombe Hospital, Bankstown, NSW, Australia

Current criteria for diagnosis of gestational diabetes (GDM) were derived from antenatal plasma glucose [PG] levels associated with subsequent development of diabetes in the mother. The ability of these criteria to predict adverse fetal outcomes has been debated.

In the Hyperglycemia and Adverse Pregnancy Outcomes (HAPO) Study involving over 23000 pregnancies, there were continuous graded relationships with increasing maternal hyperglycaemia for the primary outcomes of birth weight over 90th percentile, caesarean delivery, neonatal hypoglycaemia, and cord C-peptide over 90th percentile. Following analysis of HAPO study data, the International Association of the Diabetes and Pregnancy Study Groups (IADPSG) published this year recommendations on the diagnosis and classification of hyperglycemia in pregnancy.

The IADPSG recommendations include:

(1) Definition of a new category 'Overt Diabetes in Pregnancy' [fasting PG ≥ 7.0 mmol/L or HbA_{1c} level ≥ 6.5% or random PG ≥ 11.1 mmol/L, plus confirmation].

(2) Testing women at the first prenatal visit for fasting PG, HbA_{1c}, or random PG – universal vs 'high-risk' testing depends on local population frequency of abnormal glucose metabolism and on 'local circumstances'.

(2a) GDM is diagnosed if fasting PG is ≥ 5.1- 7.0 mmol/L.

(3) If fasting PG is < 5.1 mmol/L, test for GDM between 24 and 28 weeks of gestation with a 75g oral glucose tolerance test (OGTT).

On the OGTT:

(3a) Overt diabetes is diagnosed if fasting PG is ≥ 7.0 mmol/L.

(3b) GDM is diagnosed if ANY value(s) equals or exceeds thresholds of fasting PG of 5.1 mmol/L, 1-hour PG of 10.0 mmol/L, 2-hour PG of 8.5 mmol/L.

(4) Women diagnosed with GDM or Overt Diabetes in Pregnancy should undergo postpartum glucose testing.

This detection strategy is expected to increase the frequency of hyperglycaemic disorders in pregnancy. Australia needs to decide whether to adopt these recommendations for both the assessment process and diagnostic thresholds.

002

THE NEW IADPSG CRITERIA FOR THE DIAGNOSIS OF DIABETES: IMPLICATIONS

J. Flack

Diabetes Centre, Bankstown-Lidscombe Hospital, Bankstown, NSW, Australia

We have assessed and published[1] the workload implications of adopting the recommended IADPSG changes to Gestational Diabetes (GDM) diagnostic criteria. Whilst we are NOT suggesting, [and have never suggested], that these findings should be used as a reason NOT to introduce these new criteria, the estimated increases in GDM workload that will result will need to be managed. How these increases were determined will be presented, as well as a discussion on the issues identified that will need to be addressed, including Pathology Testing implications, workforce concerns, midwife and obstetric visit issues and the potential for risk stratification. Ultimately, it may be that we need to entirely change our approach to the management of GDM!

1. Recommended Changes To Diagnostic Criteria For Gestational Diabetes: Impact On Workload. Jeff R. Flack, Glynis P. Ross, Suyen Ho, Aidan McElduff. *Australian and New Zealand Journal of Obstetrics and Gynaecology 2010 [In Press]*

003

WOMEN WITH A PAST HISTORY OF GESTATIONAL DIABETES (GDM) ARE A POTENTIAL TARGET FOR INTERVENTIONS TO PROMOTE LONG-TERM HEALTH

A. McElduff

Northern Sydney Endocrine Centre, St Leonards,NSW, Australia

GDM is common. Women who are diagnosed with GDM are at significant risk of future health problems that are at least in part preventable: Type 2 Diabetes and cardiovascular disease. This makes these women an ideal target for public health interventions.

The increased risk of developing Type 2 Diabetes is proportional to the degree of glucose abnormality in pregnancy regardless of how that is assessed and depends on the background rate of Type 2 Diabetes in the relevant population/ethnic group. The risk of developing diabetes increases each year for at least 20 to 25 years. There is also an increased risk of cardiovascular disease and in the past, mortality although this is less well known. A proportion of the increased cardiovascular disease is explained by the presence of type 2 diabetes but the diabetes does not account for all of the increased risk.

The onset of Type 2 Diabetes can be prevented or at least delayed by appropriate lifestyle and pharmacological interventions. Cardiovascular events/disease can be prevented or delayed with appropriate interventions.

Women with a past history of gestational diabetes present a potential target for interventions to improve long-term health. This should be approached as a public health measure and at present is done badly or not at all

004

ORAL AGENTS IN GDM- YES OR NO?

C. J. Nolan

Endocrinology, The Canberra Hospital and Australian National University Medical School, Canberra, ACT, Australia

Gestational diabetes (GDM) has both short and long-term consequences for the mothers and babies. We need to be cognisant of all outcomes in developing optimal management strategies for this condition.

Recently there has been increased interest in the use of oral hypoglycaemic agents, in particular metformin and glibenclamide, in pregnancies complicated by GDM. This has arisen following separate randomised clinical trials of glibenclamide (glyburide) (published 2000) and metformin (published 2008) in GDM that appear to be favourable for these agents with respect to perinatal outcomes. Long-term outcomes of their use are not known.

Metformin shows much promise. The metformin in gestational diabetes (MiG) study showed comparable perinatal outcomes when metformin as opposed to insulin was used as initial pharmacologic treatment of GDM women. Potential benefits of metformin over insulin were lower maternal weight gain and less neonatal hypoglycaemia. Metformin, however, easily crosses the placenta and the potential long-term effects (beneficial or harmful) on the offspring are unknown.

Glibenclamide appears to be safe in the perinatal period in mild GDM, but may not be in more severe degrees of hyperglycaemia. It may cross the placenta. Its long-term effects on mothers (especially maternal beta cells) and the offspring are unknown.

If women with diabetes conceive on metformin or a sulphonylurea, these agents should not be immediately stopped. The risk of untreated hyperglycaemia is likely to outweigh the risk of the oral agents. These women should be referred to a team expert in the management of diabetes in pregnancy usually for transfer to insulin therapy.

In summary, oral agents may be used in pregnancy if insulin is not an option. Metformin is the preferred one. Caution is required for more broad usage of oral agents in pregnancy until we have evidence of their long-term safety.

005

THYROID DISEASE AND PREGNANCY

A. Gargya

Bankstown-Lidcombe Hospital, Bankstown,NSW, Australia

In recent years, increasing interest has developed concerning the role of thyroid function in pregnancy and its repercussions on maternal and fetal outcomes. Subclinical thyroid dysfunction and thyroid autoimmunity are not uncommon in women of reproductive age. Thyroid dysfunction has been related to subfertility, obstetrical complications such as gestational hypertension, preeclampsia and premature delivery and impaired neurocognitive development of the fetus. Thyroid autoimmunity has also been associated with miscarriage and preterm delivery; thyroid hormone treatment has been shown to reduce obstetric risk in this setting. Controversy exists on whether universal thyroid function screening should be performed in pregnant women. The definition of what constitutes a normal TSH in pregnancy is in flux - guidelines suggest that an upper limit of 2.5mIU/L in the first trimester be used. Trimester-specific reference ranges have been determined in a number of recent studies, however with variations in absolute reference limits. This presentation will summarise the controversies and literature surrounding thyroid function in pregnancy and will highlight a number of important clinical recommendations.

006

GENETICS & EPIGENETICS: NATURE VERSUS NURTURE DISCOVERY OF LAYERS OF CHANGE IN THE CANCER GENOME

S. Clark

The Garvan Institute of Medical Research, Sydney,NSW, Australia

Despite the completion of the Human Genome Project we are still far from understanding the molecular events underlying phenotypic differences and the effect of environment on disease susceptibility[1]. It is clear that individuality emerges not so much from the existence of genes but from the way they express themselves. What we still need to understand is why some genes are switched on while others are switched off and why are some turned up, while others are turned down? Epigenetics seems to hold the key as to what controls this expression and potentially how environmental factors may influence it over a lifetime? DNA holds our genes and their expression is controlled by a series of proteins (transcription factors and histones) and chemical tags (DNA methylation) that are attached to the DNA. These DNA “tags” form the epigenome and once formed can be passed on to each daughter cell ensuring a memory of expression over a lifetime. Essentially the epigenome has all the attributes of the molecular code responsible for creating variation within an organism and cell types that can lead to genes being on or off in response to normal and abnormal signals. Interestingly a change in the epigenome is one of the most common lesions in cancer. Our group has been studying these lesions and are beginning to build an epigenome map of normal and cancer cells. We have found that layers of epigenetic information are often concordantly changed in large regions across the cancer genome, suggesting that one small mistake can trigger a spread of mistakes that encompass tumour suppressor and oncogenes that together contribute to the cancer phenotype[2-4].

(1) 1. Jones P et al (2008) Moving AHEAD with an international human epigenome project. Nature 454: 711-715.

(2) 2. Frigola J, Song J, Stirzaker C, Hinshelwood RA, Peinado MA and Clark SJ (2006). Epigenetic remodeling in colorectal cancer results in coordinate gene supression across an entire chromosome band. Na

(3) 3. Clark SJ (2007) Action at a distance: Epigenetic silencing of large chromosomal regions in carcinogenesis. Hum Mol Genet 16: R88-R95

(4) 4. Coolen M, Stirzaker C, Song J, Statham A, Robinson M, Lacaze M, Moreno M, Kaplan W, Speed T, and Clark SJ. Consolidation of the cancer genome by long range epigenetic silencing. (2010) Nature Cell

007

THE DIAGNOSIS OF GDM, BY THE ADIPS AND IADPSG CRITERIA

D. Garg[1], G. J. Morris[2], F. San Gil[3], R. G. Moses[4]

[1]Advance trainee, Endocrinology, SESIAHS,Wollongong Hospital, Wollongong, NSW, Australia
[2]Scientific Office,pathology, Southern IML Pathology, wollongong, NSW, Australia
[3]Principal Scientist, SESIAHS,Wollongong Hospital, Wollongong, NSW, Australia
[4]Director of Diabetes Services, SESIAHS, SESIAHS,Wollongong Hospital, wollongong, NSW, Australia

Introduction
The International Association of Diabetes and Pregnancy Study Groups (IADPSG), based on HAPO study has recommended new evidence based diagnostic criteria for the diagnosis and classification of diabetes in pregnancy. The proposed criteria would diagnose GDM in 17.8% of the population. This is a marked increase over the number of women currently being diagnosed with the ADIPS criteria. We conducted a review to examine the impact of the new criteria on incidence of GDM in the Wollongong area.
Methods
The overwhelming majority of GTTs in pregnancy in the Wollongong area are conducted by either the public hospital for antenatal clinic women or one large private pathology group favoured by general practitioners and private obstetric care providers. Unless indicated earlier, all pregnant women are offered a 75g GTT at the beginning of the third trimester. There is more than 90% compliance with this request. No preliminary challenge test is used. Whereas previously samples were only taken fasting and at 2 hours, from the beginning of 2010 an additional one hour sample has been collected.
Results
There were 1275 GTTs suitable for evaluation (571 public and 704 private). With the ADIPS criteria the rate of GDM was 49/571 (8.6%) for public patients and 74/704 (10.5%) for private patients; combined 123/1275 (9.6%). With the proposed IADPSG criteria the rate of GDM was 52/571 (9.1%) for public patients and 114/704 (16.2%) for private patients; combined 166/1275 (13.0%).
With respect to the IADPSG criteria, a lesser percentage of public patients (43.5%) were diagnosed on the fasting glucose alone compared with private patients (63.2%).
Conclusion
The IADPSG criteria will overall diagnose a greater percentage of women with GDM but this number will vary depending on the population being tested.

008

TWIN PREGNANCIES IN WOMEN WITH GESTATIONAL DIABETES: RETROSPECTIVE REVIEW 1993-2009

J. R. Flack, G. P. Ross
Diabetes Centre, Bankstown-Lidcombe Hospital, Bankstown, NSW, Australia

Background : Twin pregnancies occurred in approximately 1.5-1.6% of births in NSW 2002-2006.[1] There are conflicting data on whether gestational diabetes [GDM] is more common in twin pregnancies. We have previously presented our GDM singleton births experience since 1994.[2]

Aim : To assess maternal characteristics, management and outcomes of twin pregnancies in women with GDM.

Methods : We assessed prospectively collected data held in our computerised database for all women with twin pregnancies who delivered from 30/4/1993-23/12/2009, and undertook maternity unit register review for all twin pregnancies in our hospital from 1997-2009. Data items analysed were: maternal age, gravida/parity, pre-gestational BMI, gestation at GDM diagnosis and delivery, HbA1c at GDM diagnosis, insulin therapy, and percent caesarean birth. We compared these with data for 1698 singleton births in the same period. Statistics were t-test and Chi Squared. Significance was $p<0.05$.

Results : There were 31 twin births amongst 2816 GDM women seen from 1993-2009 [1.1%]. Of these, 26 were seen in 2419 GDM women [1.07%] from 1997-2009, compared with 202 twins in 23,314 non-GDM births [0.87%] ($p=0.4$). Overall, 228 twins in 25,733 hospital deliveries represents 0.89%. Data in the Table are Mean±SD [Range] or percent.

	Twins	Singleton Births	p=
Maternal Age[years]	34.7±5.4	32.2±5.3	<0.05
Gravida	3.3±2.0[1-8]	3.0±1.9[1-15]	0.35
Parity	1.5±1.4[0-6]	1.4±1.5[0-9]	0.48
Pre-gestational BMI[kg/m^2]	27.6±8.2	26.1±6.4	0.19
Gestation[GDM diagnosis-weeks]	26.9±6.3[8-35]	28.1±5.3[6-39]	0.21
HbA1c[GDM diagnosis-%]	5.3±0.5[4.6-6.6]	5.3±0.6[2.1-9.9]	0.78
Insulin Rx	35.5%	30.9%	0.70
Gestation[Delivery-weeks]	37.7±1.3[35-40]	39.0±1.2[36-44]	<0.0001
%Caesarean	48.4%	23.0%	<0.01
Birthweight	5366±588 2702±321 2662± 350	3360±479	-

Conclusions: In our hospital, twin pregnancies occurred less commonly than the NSW average. GDM was not statistically more common in twin pregnancies. GDM women with twins were significantly older, delivered earlier and were more likely to have a caesarean delivery than GDM women with singleton pregnancy. There was a non-significant increased need for insulin therapy.

(1) Centre for Epidemiology and Research. NSW Department of Health. New South Wales Mothers and Babies 2006. NSW Public Health Bull 2007; 18(S-1).

(2) Predictors of LGA and SGA Birthweight in Women with Gestational Diabetes Mellitus.

009

POTENTIAL EXISTS TO DECREASE THE STILL BIRTH RATE FOR INFANTS BORN TO ABORIGINAL WOMEN WITH DIABETES IN PREGNANCY USING A SYSTEMATIC APPROACH.

C. Porter, I. Ellis, T. Skinner

CUCRH, SPARHC UWA, Geraldton, WA, Australia

Introduction:
This study sought to identify differences in pregnancy outcomes for rural and remote women, with and without diabetes.
Methodology:
The Midwifery Notification Database 2000-2007 provided details of age, parity, gestational age, smoking, birth weight, type of birth and birth status. Using two Caucasian and Aboriginal women references groups to compare women who delivered in their health region of residence with a diabetes diagnosis recorded.
Results:
Aboriginal women with diabetes had a lower mean age (29.03 yrs, SD±6.26: 31.66 yrs, SD±5.33), reduced gestational age by nearly two weeks (37.49 weeks, SD±2.63) and were multiparous (P=2.53, SD±1.97). Birth outcomes for Aboriginal women with diabetes showed that stillborn rates were increased more than tenfold (1.9%, N=16) and emergency C-section (23.9%, N=197) was performed 14% more than in the Caucasian reference group and was increased threefold compared to the Aboriginal reference group (8.1%, N=358). Aboriginal women with diabetes had babies' (3359.51g, SD±798.6) that were 201g lighter than the Caucasian reference group but were 83g heavier than the Aboriginal reference group (3276.56g, SD±536.8). With maternal diabetes the Caucasian babies' birth weight decreased 73g compared to their reference group (3477.59g, SD±467.6).
Conclusion:
The impact of diabetes on pregnancy outcomes for Aboriginal and Caucasian women is different. Aboriginal women with diabetes had significantly heavier babies than their reference group, but significantly lighter babies than the Caucasian reference group. They have a greater chance of emergency C-Section; with elective C-section a similar chance to the Caucasian reference group. Aboriginal babies have a very significant risk of stillbirth with maternal diabetes.

DIFFERENT METER, DIFFERENT INSULIN REQUIREMENT IN GDM WOMEN

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Background : Data were presented on meter performance variation last year.[1] Our Gestational Diabetes Mellitus [GDM] management strategies follow ADIPS recommendations. Therapy is diet, with insulin commenced if optimal targets (based upon self monitoring blood glucose [SMBG] results) are not achieved: fasting BGL<5.5mmol/l and 2-hour postprandial BGL<7mmol/l. In July 2009 we replaced Xceed [Meter1] with Performa [Meter2] in the diabetes pregnancy service. We observed a reduction in insulin usage following the change.

Aim : To assess the influence of different meters on insulin use in GDM management with singleton pregnancy outcomes.

Methods : We analysed data held in our computerised database in two 6-month periods: Period1 (01Jan09–30Jun09); Period2 (01Jul09–31Dec09), for maternal characteristics, insulin use and outcomes. Exclusion: incomplete pregnancy outcome items. Data were compared by t-test, Chi-Squared and Fisher-Freeman-Halton exact test [ethnicity], with statistical significance $p<0.05$.

Results : Of GDM women seen in 2009, 243/256 had complete data. Insulin was prescribed for 58/100 women (58.0%) [Period1] versus 46/143 women (32.2%) [Period2], $p<0.0001$. No characteristic [including ethnicity] was statistically different between the two patient groups to explain the significant drop in insulin use: [Table].

Mean ± SD	Period1 [n=100]	Period2 [n=143]
Age[years]	32.3±5.7	32.0±5.8
DiagnosisGestation[weeks]	25.2±7.2	26.6±6.3
ravida/ Parity	3.1±1.8/1.4±1.3	2.9±1.7/1.2±1.2
Pre-GestationalBMI	26.4±6.9	26.9±6.3
WeightGain[kgs]	14.2±14.3	13.8±12.3
GDM Risks	1.6±1.0	1.8±1.0
Insulin Dose[total]	40.5±38.6	30.6±30.3
HbA1c at Diagnosis[%]	5.7±0.7	5.6±0.5
Diagnosis fBGL	5.1±1.0	5.2±0.8
Diagnosis 2HrBGL	9.0±1.3	8.8±1.2
DeliveryGestation[weeks]	38.6±1.2	38.7±1.4
BirthWeight[grams]	3254±457	3358±521
Baby Sex[%male]	47.0%	44.8%
%SGA/LGA	5.1%/16.3%	6.5%/20.3%
Apgar[5mins]	8.9±0.5	9.0±0.7

Conclusion : Insulin initiation and adjustment are guided by SMBG. Management targets and practices were not changed and no significant differences in patient characteristics [including maternal weight gain] were seen to explain the considerably lower percentage of women requiring insulin therapy in Period2. Meter2 use resulted in reduced insulin requirement with similar pregnancy outcomes in these two GDM populations.

(1) Evaluation Shows Sub-Optimal Performance Of Blood Glucose Meters In An Antenatal Diabetes Clinic. N. Perera et al. ADIPS ASM Adelaide 2009

011

THE EFFECT OF DEGREES OF OBESITY ON TREATMENT AND OUTCOME OF GESTATIONAL DIABETES MELLITUS

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Background: Obesity is a strong risk factor for gestational diabetes mellitus (GDM). However, the characteristics of GDM behaviour in obese women is not well established.
Aim: To examine the relationship between increasing degrees of obesity and glycaemic outcomes in women with GDM.
Methods: A retrospective study of 1007 singleton pregnancies with GDM (according to ADIPS criteria) in the period between 2002 and 2009 was performed. 38.3% (383/1007) were obese according to the WHO classification of adult obesity (55.4% class I obesity, 26.4% class II obesity, 18.3% class III obesity). Women who delivered before 32 weeks of gestation were excluded. All women received dietary advice and pharmacotherapy (insulin or metformin) was commenced if the fasting blood glucose level (BGL) was >5.5mmol/L and/or if the postprandial BGL was >7.0mmol/L. Analyses using ANOVA, logistic regression and non-parametric tests were performed to compare women in the three classes of obesity with regards to their maternal age, parity, gestational age, weight gain during pregnancy, antenatal and postnatal glucose tolerance test values, HbA1c, birthweight and insulin requirements.
Results: Women with class III obesity had higher insulin requirements, birthweight, antenatal fasting BGL and postnatal fasting BGL compared to women with class I obesity but not class II obesity. There were no differences in maternal age, parity and gestational age among the three groups. Women with class I obesity had lower HbA1c levels than those with class II obesity only. There was no difference in weight gain during pregnancy between those with class I and class II obesity, however, women in both groups had more weight gain compared to those with class III obesity.
Conclusion: There are significant differences in glycaemic outcomes between those with class I and class III obesity which may have implications for the management of GDM according to a woman's weight. Further studies to delineate the risks associated with increasing degrees of obesity will help to improve health care to these women.

012

POSTNATAL MANAGEMENT OF GESTATIONAL DIABETES : BARRIERS AND BRIDGES.

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Aim: Facilitate the postnatal management of women with gestational diabetes (GDM) by:
Increasing practice nurse's awareness regarding GDM post-natal follow up
Improving communication between primary and secondary health care professionals.
Increase uptake of 6 weeks postnatal Oral Glucose Tolerance Test (OGTT).
Enrol at risk women to annual or 2-3 yearly OGTT.
Background: Up until 2007, The diabetes in pregnancy clinic (DIP clinic) (under Waikato DHB, NZ) used to carry out 6 weeks postnatal follow up of women with GDM with a 70% success rate in the uptake of OGTT Due to increased workload, the responsibility of follow-up was transferred to their General Practitioner (GP) resulting in a significant 30% drop in the number of women who did their OGTT.
Methods:
A prominent marker in the Well Child book alerting the Practice nurses that the child's mother has had gestational diabetes
Communication via telephone with the practice nurse, providing them with full antenatal history and postnatal follow ups.
Copy of the discharge letter sent to General Practitioner and the practice nurse.
Results: Practices within the district with high incidence of GDM were targeted for follow up. 10% of practice nurses used the formulated guideline. However the bulk of the work has still remained with the Diabetes Nurse Educator. In spite of this, there have been positive outcomes-
Marked increase in rapport between the DNE and the practice nurses.
A recall system in the MEDTEC database for either an annual or 2 yearly OGTT.
Increase in the number of women attending postnatal OGTT
Early detection of pre or type 2 Diabetes.
Conclusion: This project is in its infancy and is planned to be continued as a standard practice as early detection and intervention has been proven to decrease the chronic complications of Diabetes.

013

DETECTION OF OVERT DIABETES IN PREGNANCY – IADPSG RECOMMENDATIONS AND BEYOND

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The recent IADPSG recommendations (Diabetes Care, 33(3) March 2010: 676 – 682) on the diagnosis and classification of hyperglycemia in pregnancy recommend that women first noted to have markedly elevated glycemia in pregnancy be classified as having "overt diabetes". This differs from previous definitions of gestational diabetes.

In reaching this recommendation, the IADPSG consensus panel favoured pragmatism and clinical relevance over strict scientific rigor. It was recognised that it would often be impossible to determine whether hyperglycemia definitely antedated pregnancy. Even reclassification with oral glucose tolerance testing following pregnancy may not provide diagnostic precision in all cases.

Further, the panel elected not to propose any new, pregnancy specific, glycemic thresholds to be used to define "overt diabetes", opting instead to adopt those commonly used outside pregnancy and listed in Table 1.

Table 1

Measure	Consensus threshold
FPG	≥ 7.0 mmol/L (126 mg/dL)
HbA1c	≥ 6.5% (DCCT / UKPDS standardized)
Random PG	≥ 11.1 mmol/L (200 mg/dL) + confirmation

This pragmatic approach, implemented at the first antenatal visit, should identify a group of women with marked hyperglycemia and allow them to receive rapid treatment and close follow up during pregnancy. The panel did not make a firm recommendation regarding universal vs. selective testing for overt diabetes in early pregnancy, leaving this decision to local / regional bodies.

Acknowledged weaknesses of this approach include the arbitrary, non pregnancy specific thresholds, the lack of firm recommendations regarding lesser degrees of hyperglycemia and the fact that screening at the booking obstetric visit is too late to influence the risk of major congenital anomalies in the index pregnancy.

Further, a major challenge for all those involved in diabetes care is to develop and implement programs for effective, well implemented pre pregnancy detection and care for women with Type 2 diabetes, especially given the increasing prevalence of obesity and other risk factors in younger women.

How should ADIPS proceed in this area?

014

EARLY DIAGNOSIS OF GDM – AN AUCKLAND PERSPECTIVE

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The IADPSG consensus panel has recommended early testing to diagnose over diabetes in pregnancy in either all women or high risk women. A fasting glucose ≥ 7.0mmol/l or HbA1c ≥ 6.5% or random plasma glucose ≥11.1mmol/l (with confirmation) is sufficient to diagnose overt diabetes in pregnancy. A fasting plasma glucose ≥5.1mmol/l and <7.0mmol/l diagnoses early GDM.

There are no data to help us decide which recommendation is most appropriate in our population. The STEP (Screening for Type 2 diabetes in Early Pregnancy) study (R Hughes et al) is underway to determine how a random plasma glucose and/or HbA1c performs with respect to screening for diabetes/GDM when women book for pregnancy care.

A pragmatic approach to early screening has been developed in Auckland. Women who have a high risk for underlying glucose intolerance are offered early testing with booking bloods. This includes women with one or more of the following: previous GDM, ≥40 years, morbid obesity, PCOS, two first degree relatives with diabetes, previous obstetric history (stillbirth, shoulder dystocia, macrosomia >97th centile), or glycosuria. An HbA1c (and fasting plasma glucose if possible) are performed. If the HbA1c is above the reference range (6%) women are referred directly to the antenatal diabetes clinic. If within the reference range a 75g OGTT is recommended at 16 weeks and, if normal, repeated at 24-28 weeks. If fasting glucose ≥5.5mmol/l women are referred directly to clinic; this will lower if IADPSG criteria are accepted.

015

PRE-ECLAMPSIA

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Pre-eclampsia is a common complication of pregnancy. It remains the cause of significant morbidity and mortality. Despite advances in the understanding of the pathophysiology of this condition its clinical management has remained unchanged. Principles of management require assessing the risks to the mother from prolonging pregnancy against the risks and benefits to the baby that would result from delivery. This presentation will review the recent advances in the understanding of pre-eclampsia with emphasis on the role of angiogenic factors. Evidence for a contribution of altered glucose homeostasis to pre-eclampsia will be presented along with evidence that optimal glycaemic control can reduce the risk of proteinuric hypertension. Appropriate maternal and fetal investigations along with principles of management of pre-eclampsia to guide clinicians will be presented.

016

WEIGHT-GAIN BEFORE GESTATIONAL DIABETES MELLITUS DIAGNOSIS: HOW MANY WOMEN GAIN TOO MUCH?

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Background: Excessive pregnancy weight-gain is an independent contributor to Gestational Diabetes Mellitus[GDM] risk and fetal macrosomia. We previously reported the relationship between maternal weight-gain and birthweight[1].

Aim: To determine how many women gained above Institute of Medicine[IOM 2009][2] recommended pregnancy weight-gain ranges and LGA frequency.

Methods: We analysed data held in our computerised database from 1994-2009 for women with GDM diagnosed by ADIPS criteria. Exclusions were incomplete data, GDM presentation <24weeks, delivery <36weeks, or last recorded clinic weight >4weeks pre-delivery. Maternal weight-gain at presentation for GDM management; in the third trimester; and for the entire pregnancy, were compared to IOM recommendations by pre-pregnancy BMI category: [a] underweight [BMI<18.5] ; [b]normal weight[BMI 18.5-24.9] ; [c]overweight[BMI 25-29.9] ; [d]obese[BMI >30] . These recommendations assume 0.5-2.0kg total weight-gain for the 1st trimester, thence [a]0.45-0.59kg/wk; [b]0.36-0.45kg/wk; [c]0.27-0.32kg/wk; [d]0.18-0.27kg/wk for 2nd and 3rd trimesters. Excessive weight-gain was above the maximum recommended for pregnancy stage per category.

Results: Percent above target and with LGA are shown [Table].

BMI[n=]	Recommendation entire pregnancy	1st-2nd Trimester	3rd Trimester	Entire Pregnancy	LGA[Above IOM] versus LGA[Met IOM]
[a][74]	12.7-18.2kg	63.5%	0%	12.2%	(0%versus1.5%)
[b][712]	11.4–15.9kg	76.7%	1.8%	25.6%	(20.9%versus9.1%)**
[c][381]	6.8-11.4kg	80.8%	7.6%	50.4%	(22.4%versus12.2%)**
[d][320]	5–9.1kg	74.7%	14.4%	60.3%	(28.5%versus13.4%)*
All[1487]		76.6%	5.9%	38.7%	** p<0.001 * p<0.01

Overall 76.6%[n=1140] gained above IOM recommendations before GDM presentation, whilst far fewer did so in the 3rd trimester[n=88], reducing those exceeding total weight-gain recommendations overall to 38.7%[n= 576]. Of those who gained excessive weight, there was a significantly increased LGA likelihood for [b][c]and[d].

Conclusion: Excessive weight-gain in pregnancy was extremely common, mostly occurring before GDM diagnosis, and may have contributed to GDM development. Excessive weight-gain was much reduced in the 3rd trimester (and consequently total weight-gain) possibly due to dietary intervention. These findings support the need to provide dietary advice earlier in pregnancy aimed at achieving optimal weight-gain according to pre-pregnancy BMI.

(1) Predictors of LGA and SGA Birthweight in Women with Gestational Diabetes Mellitus.

(2) Institute of Medicine of the National Academies (2009) Weight-gain During Pregnancy: Reexamining The Guidelines, National Academies Press, Washington DC.

017

A COMPARISON OF WEIGHT GAIN IN LATE PREGNANCY IN WOMEN WITH AND WITHOUT GDM

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Background: Obesity and excessive maternal weight gain in pregnancy are associated with increased risk of maternal complications such as Gestational Diabetes Mellitus (GDM). However, over the past several decades the steady increase in average pre-pregnancy body mass and weight gains in pregnancy has meant that most women fall outside "ideal" BMI ranges making the provision of evidence-based advice difficult. We undertook this study to assess weight gained in late pregnancy in women with and without GDM. Aims: 1.To quantify second and third trimester weight gain in women with and without GDM. 2.To examine influence of diet and lifestyle treatment for GDM on late-pregnancy weight gain. Method: 212 pregnant women (115GDM, 97 non-GDM) attending outpatient clinics were weighed at recruitment and subsequent visits until delivery. Both groups received only routine clinical care; this also included formal lifestyle education for GDM women. Results: GDM and non-GDM groups showed similar pre-recruitment gestational weight gain (GDM 8.4kg; non-GDM 7.5kg;p=0.44), age (GDM 32.2yrs [95%CI 31.27, 33.10];non-GDM 31.5yrs[30.45,32.48]) and gestation (GDM 30.4 weeks [29.84,30.98]; non-GDM 30.3 weeks [29.42, 31.13]), but differing mean weight (GDM 74.3kg [range 47.2-126.4kg]; non-GDM 84.3kg [range 45.0-170.7kg];p=0.0008), at recruitment. GDM women had less weight gain than non-GDM women (GDM total 1.18kg(1.6%)[range -3.8-7.1kg], 0.16kg/week [range -0.45-0.83kg/week]; non-GDM total 4.0kg(4.8%)[range -0.7-18.5kg], 0.53kg/week[range -0.12-1.34kg/week];p<0.0001). GDM women had reduced weight gain in the first 4 weeks post-recruitment compared to the second 4 weeks (weeks 1-4 0.04kg/week; weeks 4-8 0.45kg/week; p<0.0001). Non-GDM women gained at a similar rate in weeks 1-4 post-recruitment as they did in weeks 4-8. (p=0.48). Conclusion: Women with GDM who receive diet and lifestyle advice gain less weight in the third trimester than those with uncomplicated pregnancies not receiving education. The role of continuing lifestyle advice in optimising gestational weight gain in late pregnancy for all women requires further study.

018

THE PREGNANCY-OBESITY EPIDEMIC: IS OBESITY AN IMPORTANT RISK IN PREGNANCY AND NEONATAL OUTCOMES?

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Introduction: There is universal recognition that obesity and diabetes in pregnancy confers adverse pregnancy and neonatal outcomes. We postulate that overweight and obese women have poorer neonatal outcomes.
Methods: A database of 44,900 pregnant women delivered at 4 teaching hospitals in Sydney between the period July 2006 and December 2009 was studied. Self-reported pre-pregnancy BMI, maternal medical history, delivery details and neonatal outcomes were analysed. An adverse neonatal outcome was defined as a large or small for gestational age infant, fetal death or malformation, admission to neonatal intensive care, neonatal hypoglycaemia or jaundice.
Results: A total of 39174 (87.2%) women had documented weight and height. Of these, 52.5% had a normal BMI and 47.5% were either overweight or obese. In overweight and obese women, after adjusting for inter-hospital differences, there was a 1.5-fold risk of having gestational diabetes (95% CI 1.40-1.64, p<0.001) and 1.5-fold of having pre-eclampsia (95% CI 1.19-1.76, p<0.001) compared to normal and underweight women. Predictors of adverse neonatal outcomes for obese and overweight women, were macrosomia (OR 2.3 95% CI 1.93-2.69, p<0.001) and neonatal complication (OR 1.1 95% CI 1.01-1.11, p<0.05). Being obese or overweight did not predict fetal death (p=0.22) or a fetal malformation (p=0.47). In obese women, there was a 4.4-fold risk of developing diabetes after adjustment for inter-hospital differences in antenatal care (95% CI 3.60-5.17, p<0.001).

In obese women with gestational diabetes there was an increased risk of macrosomia, polyhdramnios and delivering by caesarean section compared to normal weight women with gestational diabetes ($p<0.001$).
Conclusion: Overweight and obese pregnant women have an increased risk of delivery complications and adverse neonatal outcomes. In obese women, gestational diabetes is more common and adds additional risk to that of obesity alone.

019

REDUCTION IN NEONATAL INTENSIVE CARE UNIT (NICU) ADMISSIONS AS A RESULT OF USING AN EFFECTIVE AUDIT TOOL

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Aim/Objective:

· To demonstrate the effectiveness of auditing in reducing the incidence of neonatal hypoglycaemia and NICU admission rates for babies of mothers with diabetes, over a 4 year period

· Improve diabetes in pregnancy service (DIP) by facilitating a multidisciplinary team (MDT) approach to inpatient management of women and babies at Waikato Hospital.(WH)

Background:

A retrospective audit of 67 woman and babies admitted to the DIP service during 2003 - 2004 was performed, using ADIPS audit tool. This was part of the normal clinical audit; however we were experiencing problems of anxiety and dissatisfaction amongst mothers and their families relating to the separation of babies to NICU which was the clinical practise at the time. We wanted to identify where the issues were and develop appropriate mother/baby focussed solutions

Several factors were identified and solutions were implemented.

Sample:

· All women who delivered in WH with type 1 or 2 diabetes, gestational diabetes (GDM) and impaired glucose tolerance (IGT).

Method:

· A prospective diabetes database review of ADIPS audit over the 5 years from 2005 – 2009. Data were analysed using Microsoft Excel 2005.

Results:

Admissions to DIP service steadily increased over the 4 years however percentage of neonatal admissions to NICU for hypoglycaemia has reduced.

Discussion:

The implemented solutions not only improved neonatal outcomes but also resulted in an improvement in the culture within the MDT.

Recommendations:

That all DIP teams utilise the ADIPS Audit Tool to optimise service delivery to women and their babies.

GLYCEMIC TARGETS IN GESTATIONAL DIABETES AND NEONATAL ADIPOSITY: STILL MISSING THE MARK?

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The management of gestational diabetes (GDM) reduces the risk of macrosomic infants and normalizes birthweight. In comparing the body composition of infants born to mothers with treated GDM vs mothers with normal glucose tolerance, although birthweight is normalized, neonatal adiposity persists.

Our own group recently conducted a prospective study of 64 women with GDM. Daily blood glucose levels (BGLs) were retrieved from glucose meters and overall mean fasting and mean 2-hour post-prandial BGLs were calculated for each woman. Infant body composition at birth was measured and infants were classified as having high body fat if their % body fat was greater than the 90^{th} percentile of a control population. Mean infant % body fat was significantly elevated (11.9 ± 4.2 vs 10.1 ± 4.1) and 22% of infants had high body fat. Of the babies with high body fat, 71% of mothers achieved fasting and post-prandial mean BGLs within current treatment targets.

Follow up of neonates born to women in the ACHOIS showed that despite reduction in birthweight in the intervention group, there was no difference in childhood adiposity at 5 years. 33% of 5 years olds born to mothers in the intervention group, and 29% of 5 years olds born to mothers in the control group had a BMI greater than the 85th percentile, compared to between 15.9-20.1% for all 5 year olds in the population (years 1997-2007).

Current approaches to the management of gestational diabetes result in better major short term outcomes. More subtle changes, such as neonatal adiposity do not appear to be resolved through these approaches. Sadly, the first pieces of evidence from the follow up of infants in the ACHOIS study suggest that we are not making any impact on the longer term metabolic issues that these children confront. Given that gestational diabetes is strongly associated with maternal obesity, and maternal obesity is associated with multiple metabolic aberrations, perhaps perfect glucose management in the third trimester is never going to resolve the challenges that we confront.

POSTERS

032

DEFINED DIETARY PRESCRIPTION FOR GESTATIONAL DIABETES MELLITUS- IS AN INDIVIDUALISED APPROACH THE ANSWER?

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Medical Nutrition Therapy (MNT) is well recognised as first line treatment for achieving optimal glycemic control in GDM management. The goals of MNT for GDM are to promote optimal foetal growth and maternal health by meeting nutritional needs in pregnancy and to promote normoglycemia, whilst avoiding ketonuria. However, there is no consensus regarding the appropriate macronutrient composition and dietary pattern to balance these goals. The aim of this study was to review the current literature about lifestyle (diet and physical activity (PA)) influences on glycemic control in the management of GDM to examine the specific influences on BGL control.

Medline and Cochrane databases were searched according to defined search terms and requirements. Studies reporting management of GDM or risk of developing GDM were reviewed. Studies were rated according to their quality.

Few Randomised Control Trials exist investigating defined macronutrient intakes for the management of GDM. Studies have explored the efficacy of carbohydrate (CHO) restriction, the inclusion of low glycaemic index (GI) CHO in diets, the effect of PA on glycemic response and GDM risk and fat intake. 'Low GI' diet studies support their use for good glycaemic control in women with GDM. PA has demonstrated positive effects on glycemia in women with GDM.

The complexity of assessing dietary factors and PA levels on glycemia introduces difficulties in prescribing defined diets for GDM management. The quantity of each macronutrient required to optimise glycemic control will vary depending on the type of CHO and fat chosen and the amount and timing of PA undertaken.

While a specific dietary macronutrient profile prescription for GDM management remains elusive, an individualised approach to dietary modification may offer more appropriate therapy to meet nutritional needs of women during pregnancy, optimise glycaemic control while enhancing acceptability and compliance with dietary changes.

NEWLY PROPOSED GDM DIAGNOSTIC CRITERIA: REVIEW OF OUTCOMES AND DETERMINATION OF RISK

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Background : The recently published IADPSG consensus[1] proposes new gestational diabetes(GDM) diagnostic oGTT levels, based on pregnancy outcome risk, of 'any one of': fasting BGL(fBGL) >=5.1mmol/l; 1-hour(1hr)BGL >=10.0mmol/l; 2-hour(2hr)BGL >=8.5mmol/l at 24-28 weeks gestation. We previously showed that adopting these criteria will increase the number of GDM women diagnosed[2].

Aim : To guide workload management, we assessed risk in terms of pregnancy outcome amongst those at the lower end of the new diagnostic range.

Methods : Prospectively collected data were analysed from our computerised database for singleton births in GDM women diagnosed by ADIPS criteria, since 1994. Exclusions: incomplete data (except HbA1c and follow-up oGTT). Therapy was diet or insulin if optimal targets were not achieved (fBGL<5.5mmol/l and 2hr-postprandial BGL<7mmol/l). We assessed the 681 women diagnosed with fBGL<5.1 and stratified 2hrBGL into 6 categories: [a]8.0-8.4mmol/l (not GDM by new criteria); [b]8.5-8.9mmol/l; [c]9.0-9.4mmol/l; [d]9.5-9.9mmol/l; [e]10.0-10.4mmol/l; [f]10.5-10.9mmol/l. Statistical significance: p<0.05.

Results : In women first seen at (Mean±SD) 28.3±4.9 weeks[range 6-39], therapy was diet 537[78.9%] and insulin 144[21.1%]. In the whole cohort of 1698, (first seen at 28.1±5.3 weeks[range 6-39]), insulin therapy was [30.9%] p=0.0001. There was no significant difference in age, gravida/parity, HbA1c or diagnostic fBGL for any group, compared to [a]. The Table shows pregnancy outcome and post-partum oGTT data.

	[a] n=256	[b] n=170	[c] n=122	[d] n=76	[e] n=36	[f] n=21
Insulin[%]	18.0	22.4	24.6	18.4	22.2	38.1[p=0.04]
LGA[%]	9.0	7.6	9.0	13.2	8.3	9.5
Caesarean[%]	20.0	15.3	26.2	22.4	11.1	14.3
DeliveryGestation[Wks]	39.2±1.3	39.3±1.2	39.0±1.2	39.2±1.3	38.9±1.2	39.3±1.2
Post-partum oGTT [IFG;IGT;Type2][%]	15.2	21.9	23.1	28.1	40.0	50.0

Conclusions : We did not identify a difference in risk of adverse outcome (including postpartum abnormal oGTT), based on FBGL <5.1mmol/l and 2hr BGL cut-off value groups [a]-[d] any greater than for women [a] deemed no longer to be GDM. Potentially these women could be considered 'low-risk' and be managed less intensively.

(1) International Association of Diabetes and Pregnancy Study Groups (IADPSG) Recommendations on the diagnosis and classification of hyperglycemia in pregnancy. Diabetes Care. 2010; 33 (3): 676-682.

(2) Impact On Workload If The HAPO Study Findings Result In Changes To GDM Diagnostic BGL Cut-Off Levels. S. Ho, G.P. Ross, M. Ha, J.R. Flack. SOMANZ / ADIPS Meeting, Adelaide, 2008.

034

IS THERE A SEASONAL VARIATION IN GDM?

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Introduction
There is some evidence that blood glucose levels might be affected by temperature [1] A previously reported study did not find a seasonal variation in the incidence of GDM but did demonstrate a positive association between ambient temperature and the 2 hour GTT result [2]. Subsequently research with healthy non-pregnant volunteers in a climate chamber demonstrated a non-linear increase in the 2 hour glucose with temperature with the greatest increase being between 25 and 30 ^{0} Celsius [3].
In the present review a larger data base is examined to determine the relationship between ambient temperature and the seasonal incidence of GDM.
Methods :
The following data were considered.
All women diagnosed with GDM attending the antenatal clinic at Wollongong Hospital 2000 – 2009.
All GTTs done on pregnant women at Wollongong Hospital 2000 – 2009.
Mean maximum monthly and seasonal temperature in Wollongong.
Results
over this 10 year period Total number of women delivered was 22180; summer 5518, autumn 5374, winter 5556 and spring 5732 (NS) Total numbers of antenatal clinic women diagnosed with GDM over this 10 year period was 1030; summer 283, autumn 270, winter 257 and spring 220 (p = 0.03) . The seasonal difference in number of women diagnosed with GDM is statistically different (p=0.03),
The 2 hour glucose on the GTT varied with the seasons; summer (5.79) than in winter (5.55) with others in between (p = 0.02). The seasonal comparisons of GTT showed that average level of 2 hr blood glucose is significantly different between seasons (p=0.020).
Conclusion
More women were diagnosed with GDM in summer possibly related to a temperature related increase in the 2-hour glucose on the GTT.

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(2) Moses R, et al. Diabetic Medicine, July 1995 Volume 12 Issue 7, Pages 563 – 565
(3) Moses R.G, et al. Diabetes research and clinical practice, 1997, vol. 36, no1, pp. 35-40

035

CALCULATING THE BURDEN OF GESTATIONAL DIABETES : SHORT-TERM HOSPITALISATION COSTS IN WA.

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Whilst pregnancy and birth outcomes associated with GDM have been well-studied, there is less research examining the economic burden of this condition. We investigated WA-specific short-term hospitalisation costs for mothers with GDM and their infants. Method: A data linkage study of four WA Health administrative databases was undertaken of women and infant pairs who birthed at a tertiary hospital between 2005-2007 (N=8436). The sample excluded births prior to 28 weeks, the gestation at which screening for GDM was usually undertaken. The sample was divided into three groups: those with no additional antenatal complications, mid-level antenatal complications and severe antenatal complications. Differential costs for women with and without GDM across the three groups were calculated. Costs measures included maternal antenatal admissions, maternal and neonatal birth event costs and maternal and infant hospitalisations within 12 months of the birth. Results: A diagnosis of GDM was associated with significantly higher mean costs for maternal antenatal hospital admission across all three groups. GDM was also associated with a significant increase in the maternal birth related costs except for those with severe antenatal complications, and reduced maternal hospitalisation costs for the 12 months after the birth event. Costs for infant hospitalizations for the birth event and for 12 months after birth were lower for those

born to mothers with GDM, especially for those whose mothers had severe antenatal complications. The added cost to the WA Health system associated with GDM for mother-related hospitalisation costs was approximately $2.5 million in 2007. Comparatively, infant costs were reduced by an estimated $360K. Conclusion: GDM is associated with considerable additional inpatient health service costs for mothers but reduced infant hospitalization costs. Health service planners should consider future hospitalization requirements and health expenditure due to GDM especially as rates of GDM are predicted to rise.

036

WHAT EFFECT DOES WEIGHT GAIN IN PREGNANCY HAVE ON THE OUTCOME AND MANAGEMENT OF GESTATIONAL DIABETES MELLITUS?

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Aim: To investigate the effects of weight gain during pregnancy on glycaemic outcomes in pregnancy.

Method: A retrospective study of 1007 singleton pregnancies with gestational diabetes mellitus (GDM) from 2002 to 2009 was performed. Women who had any known degree of abnormal glucose tolerance prior to pregnancy, gestational age at delivery <32 weeks, final weight measurement in pregnancy >4 weeks prior to delivery were excluded. All women received dietary advice and pharmacotherapy (insulin or metformin) was commenced if the fasting blood glucose level (BGL) exceeded 5.5mmol/L and/or if the postprandial BGL exceeded 7.0mmol/L. Multiple linear regression and logistic regression analyses were performed to investigate the relationship between weight gain during pregnancy and birth weight, treatment type, HbA1c at ~36 weeks gestation and postnatal glucose tolerance status. Age and parity were also considered.

Results: The baseline model of weight gain in pregnancy, weight at booking visit and gestational age at delivery explained 32% of the variance in birth weight ($p<0.01$). Although statistically significant, the addition of treatment type, HbA1c and antenatal fasting BGL to the baseline model did not confer improved prediction of birth weight. Maternal age and parity were not significant when added to the baseline model. Weight gain in pregnancy was associated with increased insulin use, however, it did not predict higher insulin requirements (>30 units/day) or abnormal postnatal glucose tolerance. The weight at the initial visit alone significantly predicted the postnatal fasting BGL and higher insulin requirements during pregnancy. The strongest predictor of HbA1c in the third trimester was the antenatal fasting BGL although weight gain in pregnancy and weight at the initial visit were also significant.

Conclusion: Weight gain during pregnancy plays an important role in determining birth weight, requirement for insulin treatment and HbA1c. Further investigation into the effects of weight gain in pregnancy on GDM outcomes will help to guide recommendations for weight management during pregnancy.

037

IMPROVING THE ATTENDANCE RATE FOR POSTNATAL GLUCOSE TOLERANCE TESTS

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A postnatal Glucose Tolerance Test (P/N GTT) is recommended for all women who have had gestational diabetes. Women who have had gestational diabetes have a significant lifetime risk of developing Type 2 diabetes and 30% of them have prediabetes or Type 2 diabetes at the time of the P/N GTT.

Historically in Christchurch it was the Lead Maternity Carer's responsibility to arrange the P/N GTT. The Antenatal Diabetes Clinic provided no follow up.

In 2005 an audit was carried out at Christchurch Women's Hospital to determine the attendance rate for the P/N GTT. Only 52% were found to have completed the test. A significant 48% of the women therefore did not know their diabetes status postnatally, or potentially their future risk.

Since 2008, to improve the attendance rate and follow up process, the P/N GTT is booked and performed at Christchurch Women's Hospital. The woman is given the test date at her 36 week antenatal clinic appointment and a reminder phone call is made the day before the test. If a woman does not attend, she is contacted and another date arranged. If she does not attend a second time her General Practitioner is contacted and asked to follow up.

A second audit was performed in 2009. This revealed that as a result of the new system, the attendance rate for the P/N GTT improved to 86%. Women of the Pacific Islands were the indigenous group found to have the highest incidence of an abnormal result, and also had the lowest attendance rate at only 50%.

How can we improve the uptake of this test and therefore the long term health implications for this group?

Discussions with the leaders of the Pacific Island community are in progress.

038

CAN GESTATIONAL DIABETES BE MANAGED AS PART OF GP SHARED CARE ANTENATAL PROGRAM?

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The prevalence of gestational diabetes (GDM) in Australia has increased over the years. Traditionally women with GDM do not participate in general practitioner's (GP) shared care antenatal programs, and this meant that women with GDM are usually managed in hospital clinics rather than in the community. This has significant impact on resource allocation for diabetes centre staff.

The aim of this study was to explore GPs' perspective of their involvement in the management of GDM. An anonymous survey of GPs currently enrolled in antenatal shared care program was conducted.

Responses were received from 46 GPs. Seventeen (37%) GPs felt that women with GDM should not be managed as part of a shared care program after initial educator and dietitian review. The most common reason was a lack of time (11), as well as access to dietetic (10) and endocrinology (8) services. Of this group, half did not initiate insulin in patients with type 2 diabetes (T2DM). Twenty-two indicated that some cases of GDM, such as women who do not require insulin, could be managed as part of shared care program. Seven (15%) indicated that GDM could always be managed as part of shared care program. Of this group, all initiated insulin in T2DM. Most GPs indicated that an education program as part of shared care accreditation would provide sufficient up-skilling to allow them to manage GDM.

A limitation of this study is the small sample size of GPs from a single geographical area. Highly sensitive predictors for insulin requirement in women with GDM are yet to be developed, and this may identify women with GDM suitable for management by GPs. The willingness of GPs to manage GDM may relate to their willingness to manage DM in general, as reflected by the frequency of initiating insulin in those with T2DM.

039

ASSESSMENT OF HBA1C AS A PREDICTOR OF THERAPY REQUIREMENT, PREGNANCY OUTCOME AND POST-PARTUM OGTT IN WOMEN WITH GESTATIONAL DIABETES MELLITUS

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Background: HbA1c is well established in Type1 and Type2 Diabetes management, however its relevance in Gestational Diabetes (GDM) management is not clear. Our Diabetes Centre provides care to a large population of women with GDM in whom we routinely measure HbA1c at diagnosis.

Aim : To establish if HbA1c at GDM diagnosis predicts insulin treatment, caesarean delivery (C/S), large for gestational age (LGA) baby and/or six-eight weeks post-partum glucose tolerance (oGTT) status.

Methods : A retrospective review, assessing treatment required, pregnancy outcome and post-partum oGTT results from our computerised database of GDM pregnancies for an 18-year period [1992 to 2009]. Exclusions: incomplete data. Data were analysed in four groups based upon HbA1c result at GDM diagnosis. Statistics were Chi-squared with significance $p<0.05$.

Results : There were 1076 records suitable for analysis. With increasing HbA1c there was a significant association and increasing trend in insulin use, percent (%) LGA and abnormal post-partum oGTT [IFG, IGT or Type2] (all $p<0.05$), but not % C/S [See Table].

HbA1c at GDM diagnosis	Treatment	Outcome		6-8/52 post-partum oGTT		
	%Insulin	%C/S	%LGA	Diet treated	Insulin treated	Total
				%Abnormal oGTT	%Abnormal oGTT	%Abnormal oGTT
<5% n=375(34.9%)	16.8	17.2	20.0	18.6	27.0	20.0
5.1-5.5% n=450(41.8%)	33.1	24.6	25.1	25.9	23.5	25.1
5.6-6.0% n=184(17.1%)	37.5	24.0	37.0	31.3	46.4	37.0
>6.1% n=67(6.2%)	52.2	19.4	34.3	25.0	42.9	34.3

Conclusions : The percentage of women requiring insulin increased the higher the HbA1c at GDM diagnosis. Women with HbA1c above 5.5% at diagnosis were more likely to have a LGA baby, and an abnormal post-partum oGTT especially if they have also required insulin treatment. These results indicate that HbA1c at GDM diagnosis is a predictor for treatment required in pregnancy, LGA and post-partum glucose tolerance. We recommend vigilance in GDM management and post-partum follow-up in women with HbA1c at diagnosis above 5.5%.

040

PILOT STUDY OF AN INDIVIDUALIZED EARLY POST PARTUM INTERVENTION TO INCREASE PHYSICAL ACTIVITY IN WOMEN WITH PREVIOUS GESTATIONAL DIABETES

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Whilst the benefits of physical activity in preventing progression from IGT to overt diabetes in older adults are well recognised, it is not clear whether these can be translated to effective prevention of progression towards diabetes after a GDM pregnancy. We sought to devise a convenient, home based exercise program with regular telephone support, applicable to the early post partum period.

Twenty nine women with previous gestational diabetes by local ADIPS criteria, without overt diabetes on post partum OGTT, were enrolled at six weeks post partum into a randomised controlled trial of usual care (Controls) vs. Supported care ("SC" - individualised exercise program with regular telephone support and follow up). Baseline characteristics (Mean ± SD) were Age 33 ± 4 years, Weight 80 ± 20 kg and BMI 30.0 ± 9.7 kg / m^2 . The women were followed from 6 to 18 weeks post partum. Changes reported below represent comparisons between these two time points.

Planned physical activity increased by 96 ± 172 mins/wk in the Controls and 140 ± 171 mins/wk in the SC group. The median difference of 60 mins/wk in the SC group compared to zero in the Controls did not achieve statistical significance (p=0.234, Man Whitney U test). In categorical analysis, 10/15 women in the SC group vs. 4/13 in the Control group showed an increase of > 60 mins/wk in planned physical activity (mostly walking) at 18 weeks post partum. (p=0.12, Fisher's exact test). Body weight, BMI , waist circumference, % body fat (bio impedance), fasting glucose, fasting insulin or HOMA IR did not change significantly.

This pilot study, though clearly limited by sample size, suggests that a post partum intervention designed to increase physical activity in women with previous GDM may be feasible. If confirmed on a larger scale, the observed increase of 60 mins / week in planned physical activity would have potential public health benefits.

041

ABORIGINAL AUSTRALIAN MATERNAL AND INFANT HEALTH OUTCOMES SHOULD BE COMPARED TO AN ABORIGINAL AUSTRALIAN MATERNAL REFERENCE GROUP FOR HEALTH OUTCOMES

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Background

When deciding maternal and infant health guidelines and policy Caucasian birth outcomes are considered the gold standard. This has implications for other ethnic populations.

Method

Using Western Australian Midwifery Notification Database, from January 2000–December 2007, to select two ethnic populations being Caucasian and Australian Aboriginal women, who gave birth in their health region with no pre-existing medical condition or pregnancy complication. The MND provided maternal age, parity, gestational age, smoking, birth weight, type of birth and birth status.

Results

Of 210883 WA women giving birth 6.4% were Australian Aboriginal who were significantly younger by 5 years (24.14years;SD±5.76,P<.001), lower gestational age (39.14weeks;SD±1.58,P<.001), greater parity (1.82pregnancies; SD±1.79,P<.001), smoke three times more (49.8%;N=2209,P<.001), have more spontaneous vaginal birth (78.2%;N=3454,P<.001), lower emergency (8.1%;N=358) and elective c-section (7.4%;N=326) rates (P<.001) and had half "other" types of birth(6.3%;P<.000). The stillborn rate is 3 per 1000 births (N=13) to 2 per 1000 births (N=114) for Caucasian (p<.001).

Controlling for maternal age, parity, and smoking there were significant differences for gestational age (Caucasian 39.25weeks: Aboriginal 39.14weeks,P=.000), birth weight (3477.59g:3276.56grams,P=.000) and both APGAR scores (@1 minute 8.31:8.19;P=.001;@5minutes 9.15:9.09;P=.009). When comparing the characteristics of the Aboriginal reference group there were no significant differences for the 2000-2007 periods.

Conclusion

Aboriginal women's and Caucasian women's maternal and infant health outcomes are different as these are two different populations. When considering high risk women with co-morbidities, such as diabetes during pregnancy, it is important to consider Aboriginal maternal and infant health outcomes are compared to an Aboriginal maternal reference group.

042

THE CHANGING FACE OF GESTATIONAL DIABETES OVER TWO DECADES

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Universal screening for gestational diabetes mellitus (GDM) was instituted at The Royal Women's Hospital (RWH), Melbourne, in 1998 using Australia-wide diagnostic protocols and criteria. Diagnostic criteria have remained unchanged, but target and management guidelines have evolved since this time.

The aims of this study was to examine the changing profile of GDM, its management and particularly maternal and fetal outcomes over two decades. We have analysed all GDM pregnancies in the years 1989 (pre-universal screening), 1999 (1 year post) and 2009 (current) that were managed within the Diabetes Service.

Table 1: Demographics

Year of Analysis	Women		Average Age	Offspring Gestational Age (weeks)		Birth weight (grams)	
	Total Number	Insulin treated		Diet	Insulin	Diet	Insulin
1989	49	6 (12%)	31.45	38.0	36.0	3463	3327
1999	161	64 (39%)	32.85	38.3	37.7	3388	3371
2009	385	205 (51%)	32.98	38.4	38.2	3206	3191

There was a greater incidence of recurrent GDM in 1999 and 2009 than in 1989, usually diagnosed at 12-14 weeks. The diagnosis of GDM was usually made at 26-28 weeks.

Table 2: Fetal Outcomes

Year	Offspring Total No.	FDIU	Hypoglycaemia BGL<2.5 mmol/L	Special Care Nursery	Birthweight (percentile)			
					>90%	>90%	<10%	<10%
					Diet	insulin	Diet	insulin
1989	49	0	12 (24%)	15 (30%)	10 (23%)	4 (66%)	3 (7%)	0 (0%)
1999	162	1	6 (3.7%)	25 (15%)	26 (26%)	11 (17%)	6 (6%)	2 (3%)
2009	399	3	23 (5.8%)	36 (9%)	14 (8%)	31 (15%)	9 (5%)	6 (2%)

Table 3: Ethnicity

year	Anglo-Saxon	Indian subcontinent	SE Asian	East and north European	South European	Middle East and African
1989	10 (20%)	3 (6%)	13 (27%)	6 (12%)	4 (8%)	13 (27%)
1999	66 (41%)	11 (7%)	33 (20%)	5 (3%)	4 (2.5%)	42 (26%)
2009	130 (33.4%)	80 (21%)	89 (23%)	10(2.6%)	5 (1%)	67 (17%)

Conclusion : The number of women diagnosed with GDM at RWH has increased dramatically each decade since 1989. The characteristics of the women have changed little apart from ethnicity. Self blood glucose monitoring is now universal, and insulin use has increased greatly. Fetal outcomes have improved.

043

MANAGING THE ISSUES OF GESTATIONAL DIABETES CARE BY DIETITIANS AT KING EDWARD MEMORIAL HOSPITAL (KEMH), WA

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Background:

Most Australian Centres report a GDM incidence of 3 %-9 % [1, 2.] Between 2007-2009, number of referrals at KEMH, increased by 403, 435 and 515 respectively, associated with higher birth rate, maternal age and body weight. As part of the multidisciplinary team (Dietitians, Diabetes Educators, Physicians and Obstetricians), for diabetes care dietitians defined two problems in managing GDMs. (1) Increasing referrals exceeding staff capacity. (2) Lack of patient understanding of the importance of reporting and interpreting blood sugar levels. An earlier KEMH study, entitled “Reliability on patient held blood glucose records” highlighted this known misreporting[3].

Aim:

To establish and review an alternative model of care with greater governance of diabetes education and blood glucose reporting.

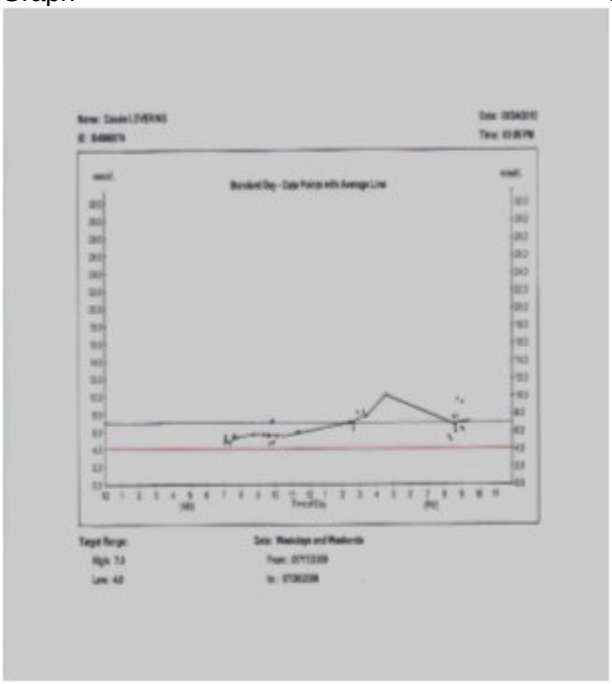
Method:
The alternative model included (1) New GDM review session in a group setting, 8-10 days after initial education session (2) Electronic retrieval of blood glucose monitors using Precision Link by Abbott Laboratories. In May 2008 an audit was conducted to measure the outcome of the alternative model of care.
Allied Health Statistics (AHS) caseload report generator was used to measure staff hours spent on GDM management before and after implementing the alternative model.
Results:
Table 1: Audit from May 2008 to July 2008

Time Period	Total no of patients referred to Diabetes Service	Patients attended first education session	Patients attended new review session	No of glucose monitors down-loaded
May 2008-July 2008	62	62 (100%)	40/62 (64.5%)	37/40 (92.5%)

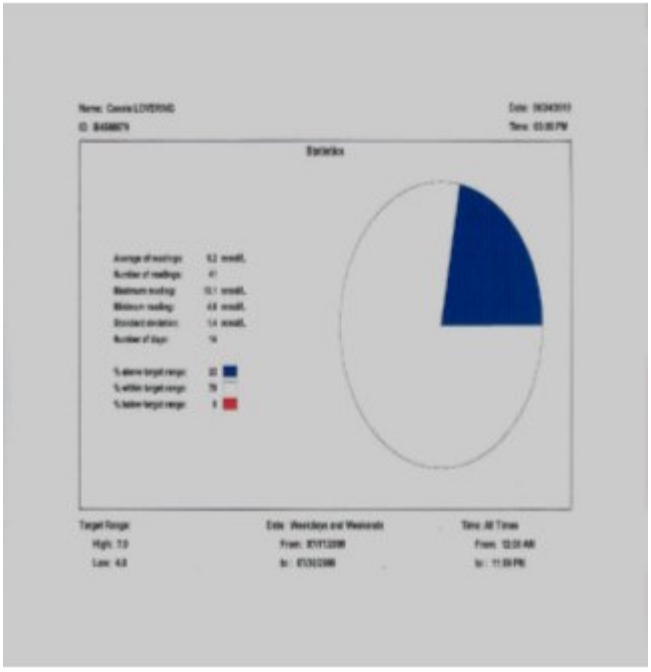
Reasons indicated for non-attendance of the review session were work commitments or other appointments in the hospital during that week. Three glucose monitors could not be downloaded as the model was either not compatible with the software or patient forgot to bring the monitor.
Table 2: AHS caseload report generator

Time Period	**Speciality**	**Setting**	**IFI (Index for intervention)**	**Patient Number**	**OOS (occasion of service)**	**Time spent**
May 07 - July 07	Diabetic	Outpatient	Diabetes in Pregnancy	133	186 1.38 OOS / patient	122 hours 0.92 hrs / patient
May 08 – July 08				110	138 1.25 OOS / patient	86.76 hours 0.79 hrs / patient

Example of a monitor download
Graph



Pie diagram



Conclusion:
Patient understanding was improved and greater efficiency was achieved, by reducing the time per patient through scheduling a review session. Results support continuation of the alternative model of care to effectively manage our GDMs until delivery.

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044

MEDICAL NUTRITION THERAPY IN GESTATIONAL DIABETES MELLITUS - CAN WE DO BETTER?

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The number of women with Gestational Diabetes Mellitus (GDM) is increasing with the obesity epidemic [1] . Poorly-controlled GDM can result in significant negative maternal and infant health outcomes [2] . Medical Nutrition Therapy is the primary intervention strategy for managing blood glucose levels (BGLs) in women diagnosed with GDM [3, 4] and guidelines recommend a dietitian as a member of the multidisciplinary team [3] , with individualised nutrition therapy essential for optimal outcomes. The American Dietetic Association (ADA) nutrition practice guidelines (NPG) outline a recommended schedule for nutrition counselling in GDM. Significant outcomes, such as reduced insulin requirements and improved BGL control, have been documented in an American study validating these guidelines [4] . No Australian GDM NPG exist. We examined the capacity (staffing levels and models of care) of two Queensland tertiary maternity centres to deliver initial education and a minimum of two of the ADA 's NPGs review appointments.

Table 1. GDM service provided by two Queensland tertiary maternity centres.

	Centre A	Centre B
Total births (n)	4717	4481
Women with GDM, n (& % of total births)	155 (3.3%)	225 (5.0%)
Dietetic staffing levels for GDM service (FTEs)	0.06	0.3
% of women with GDM seen by dietitian	88%	97.3%
% of women reviewed: once twice more than twice	<1% 0 0	30.1% 31.5% 24.2%
% women with GDM using insulin	55%	44%

Individualised dietetic care has the potential to reduce the need and costs associated with medical intervention in GDM. To provide minimum BPGs, an increase to 0.3 (Centre A) and 0.4 FTEs (Centre B) is required to prevent adverse health outcomes associated with poor nutrition-related GDM management.

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045

DIETARY BEHAVIORS AFTER GESTATIONAL DIABETES MELLITUS GROUP EDUCATION

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Background: At Royal Prince Alfred Hospital in Sydney over 470 women attend the diabetes antenatal clinic per year for management of gestational diabetes mellitus (GDM). Currently, most of these women are initially seen in a group session for initial nutritional education from a dietitian as well as basic information and education about gestational diabetes and selfblood glucose monitoring from a diabetes nurse educator. Due to time constraints at this session, the dietitian mainly focuses on carbohydrate moderation and is not able to cover the detailed recommendations from the Australian Guide to Healthy Eating (AGHE). A dietetic review is not always available to these women unless deemed necessary by the treating endocrinologist or diabetes educator.Objective: To investigate the dietary behavior of women with GDM after the group education session and compare that to the recommendations from the AGHE.
Methods: Forty-eight women with GDM were asked to complete a three-day (including two weekdays and one weekend day) food record following their initial GDM nutrition education session. The women were provided with a 2D food model booklet to assist them with portion size estimation, and any ambiguous entries were clarified via discussion. The number of servings of fruit, vegetables and dairy foods were calculated as defined in the AGHE.Results: The mean ± SD servings of fruit, vegetables and dairy foods of the study population are 1.65 ± 1.06, 4.18 ± 3.43 and 1.90 ± 0.88 respectively. Only 15% of these women met the recommendation for dairy intake, and less than 30% met the recommendation for fruit and vegetables.Conclusion: Following an initial nutritional information session, only a small proportion of these women with GDM met the AGHE recommendations for fruit, vegetables and dairy foods. Additional resources to provide regular dietetic follow up to ensure nutrient adequacy may be beneficial.

046

DIABETES IN PREGNANCY- NEW RESOURCES FOR INDIGENOUS AUSTRALIAN WOMEN

Jane Boughen
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Introduction:
After developing the well-known five-part diabetes information series *Keep Culture Life and Family Strong*, Healthy Living NT (HLNT: Diabetes Association of the Northern Territory,) undertook an evaluation of the series. It was evident from the feedback that diabetes in pregnancy information resources were also wanted. In 2008 a grant from Australian Diabetes in Pregnancy Society (ADIPS) was received to develop indigenous gestational diabetes and diabetes in pregnancy resources.

Methodology:
HLNT sent a survey out with the quarterly professional member's newsletter, Healthy Living News. The survey asked what type(s) of resources were preferred: poster, flip chart, booklet or handout and what topics must be covered.

Results:
Most of the respondents of the survey were from the Central Australian region, therefore it was decided that the resource development would continue from the HLNT Alice Springs office. Collaborative development of the resources occurred primarily with the public health nurses, diabetes educator, Aboriginal health promotions officer (poster design concept) and remote outreach midwives of the Health Development Unit, NT Government department of Health and Families (DHF). A poster was chosen as a priority with a flip chart and post consultation handout to follow. Further funding to assist with printing of the resources was granted from the 2010 Novo Nordisk Regional Support Scheme

Conclusion:

The poster developed shows two illustrated stories, one of a 'happy baby' born as a result of the mother eating healthy foods, being active, listening to cultural advice, attending antenatal checks and achieving, normal blood glucose levels. The other is a 'sick baby story' showing poor blood sugar control, poor choices such as using alcohol and tobacco and eating a lot of 'junk' food resulting in a sick baby and a worried mother.
The poster will be distributed to clinics throughout the Northern Territory. The poster and other resources are available through Healthy Living NT 89278488 or info@healthylivingnt.org.au

POSTER LISTING

S.J De Jersey

Defined dietary presecription for gestationaly diabetes mellitus- Is an Individualised approach the answer? *abs#032*

Jeff Flack

Newly Proposed GDM Diagnostic Criteria: Review of Outcomes and Determination of Risk *abs#033*

Dinesh Garg

Is There a Seasonal Variation in GDM? *abs#034*

Janet Hornbuckle

Calculating the burden of Gestational Diabetes : Short-term hospitalisation costs in WA. *abs#035*

Flora Ip

What effect does weight gain in pregnancy have on the outcome and management of gestational diabetes mellitus? *abs#036*

Lindsay Irons

Improving the Attendance Rate for Postnatal Glucose Tolerance Tests *abs#037*

Nicole Opie

Can gestational diabetes be managed as part of GP shared care antenatal program? *abs#038*

T Payne

Assessment of HbA1c as a Predictor of Therapy Requirement, Pregnancy Outcome and Post-partum oGTT in Women with Gestational Diabetes Mellitus *abs#039*

Ann Peacock

Pilot study of an individualized early post partum intervention to increase physical activity in women with previous gestational diabetes *abs#040*

Cynthia Porter

Aboriginal Australian maternal and infant health outcomes should be compared to an Aboriginal Australian maternal reference group for health outcomes *abs#041*

Anuradha Sakthivel

The changing face of gestational diabetes over two decades *abs#042*

Pushpa Sivakumar

MANAGING THE ISSUES OF GESTATIONAL DIABETES CARE BY DIETITIANS AT KING EDWARD MEMORIAL HOSPITAL (KEMH), WA *abs#043*

Shelley Wilkinson

Medical nutrition therapy in Gestational Diabetes Mellitus - can we do better? *abs#044*

J. C . Y Louie

Dietary behaviours after gestational diabetes mellitus group education *abs#045*

J. Boughen

Diabetes in Pregnancy- New Resources For Indigenous Australian Women *abs#046*- relates to a previously awarded **ADIPS-Novo Nordisk Grant for Education / Clinical Research** (2008).

The conference acknowledges the sponsorship of novo nordisk®

ABSTRACTS INDEX

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