Joint 2021 ADIPS-SOMANZ Annual Scientific Meeting abstracts

1. Gestational diabetes and long-term maternal glycemic outcomes

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Abstract

Gestational diabetes mellitus (GDM) is associated with both short- and long-term adverse outcomes in mothers. Included among these adverse outcomes is a long-term risk of developing type 2 diabetes. One of the questions addressed in the Hyperglycemia and Adverse Pregnancy Outcome (HAPO) Follow-Up Study (FUS) is whether mothers diagnosed with GDM using the International Association of Diabetes and Pregnancy Study Groups (IADPSG) criteria had a similar risk to 14 years following the HAPO pregnancy. GDM diagnosed using IADPSG criteria was associated with a 3.4-fold higher risk of developing a disorder of glucose metabolism (type 2 diabetes, impaired fasting glucose, and impaired glucose tolerance) compared to women with normal glucose tolerance during pregnancy. Despite the high risk of developing a disorder of glucose metabolism following a diagnosis of GDM, postpartum follow-up of women with a history of GDM is often inadequate despite explicit recommendations for follow-up from the American Diabetes Association and other groups. Developing approaches during pregnancy for identifying women at highest risk for progression to a disorder of glucose metabolism could enhance postpartum follow-up. To address this, we used targeted metabolomics in the HAPO FUS cohort to further characterize metabolic changes at 28 weeks gestation associated with GDM. GDM was associated with broad-based metabolic changes similar to those seen in type 2 diabetes. Circulating metabolites at 28 weeks gestation were also associated with maternal glucose levels and/or development of a disorder of glucose metabolism 10 to 14 years after the HAPO pregnancy. However, inclusion of metabolite levels at 28 weeks gestation together with maternal clinical factors did not improve prediction of development of a disorder of glucose metabolism beyond using clinical factors alone. Mediation analyses did demonstrate that a core group of metabolites at 28 weeks gestation associated with postpartum maternal glycemic traits mediated, in part, the association of GDM with development of a disorder of glucose metabolism. In summary, women with GDM diagnosed using IADPSG criteria are at risk for developing a disorder of glucose metabolism, and while metabolomics did not improve models for predicting progression to a disorder of glucose metabolism, it has helped to define the underlying pathophysiology of this process.

2. The ADIPS pilot national diabetes in pregnancy benchmarking programme

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Abstract

Background: To test the feasibility of benchmarking the care of women with pregnancies complicated by hyperglycaemia.

Methods: A retrospective audit of volunteer diabetes services in Australia and New Zealand involving singleton pregnancies resulting in live births between 2014 and 2020. Ranges are shown and compared across services.

Results: The audit included 10,144 pregnancies (gestational diabetes mellitus (GDM) = 8696; type 1 diabetes (T1D) = 435; type 2 diabetes (T2D) = 1013) from 11 diabetes services. Among women with GDM, diet alone was used in 39.4% (range 28.8%–57.3%), metformin alone in 18.8% (0.4%–43.7%) and metformin + insulin in 10.1% (1.5%–23.4%); birth was...
by elective (12.1%) or emergency (9.5%) caesarean delivery in 3.6% to 23.7% and 3.3% to 21.2%, respectively (all \( p < 0.001 \)). Preterm birth (<37 weeks) ranged from 3.7% to 9.4% (\( p < 0.005 \)), large for gestational age (LGA) to 26.7% (\( p < 0.001 \)), admission to special care nursery 16.7% to 25.0% (\( p < 0.001 \)) and neonatal hypoglycaemia (<2.6 mmol/l) 6.0% to 27.0% (\( p < 0.001 \)). Many women with T1D and T2D had limited pregnancy planning including first-trimester hyperglycaemia (HbA1c > 6.5% (48 mmol/mol)), 78.4% and 54.6%, respectively (\( p < 0.001 \)).

**Conclusion:** Management of maternal hyperglycaemia and pregnancy outcomes varied significantly. The maintenance and extension of this benchmarking service provide opportunities to identify policy and clinical approaches to improve pregnancy outcomes among women with hyperglycaemia in pregnancy.

3. Comparing IADPSG and NICE diagnostic criteria for GDM in predicting adverse pregnancy outcomes

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**Abstract**

**Background:** The diagnostic criteria of gestational diabetes mellitus (GDM) remain diverse across the world. In UK, National Institute for Health and Care Excellence (NICE) proposed a diagnostic criteria different from The International Association of the Diabetes and Pregnancy Study Groups (IADPSG) criteria, which adopted by the World Health Organisation (WHO) in 2013. Our objective is to compare the NICE and IADPSG criteria in discriminating adverse pregnancy outcomes.

**Methods:** We performed a secondary analysis of data from 6397 participants of Hyperglycemia and Adverse Pregnancy Outcomes (HAPO) study data from 5 of the 15 original study centres and compared the adverse pregnancy outcomes amongst participants who diagnosed as Group 1) normal glucose tolerance (NGT) by both the IADPSG and NICE criteria, Group 2) GDM by the IADPSG but NGT by the NICE criteria, Group 3) GDM by the NICE, but NGT by the IADPSG criteria and Group 4) GDM by both IADPSG and the NICE criteria.

**Results:** Among Hispanics, IADPSG criteria diagnosed more women with GDM than NICE criteria (19.5% vs. 10.8%, \( p < 0.001 \)) and performed better in the prediction of hypertensive disorders (gestational hypertension/pre-eclampsia), primary caesarean section, large for gestation age (LGA) (birth weight ≥90th percentile), macrosomia (birth weight ≥4 kg), adiposity (percentage of fat ≥90th percentile) as well as neonatal hyperinsulinemia (umbilical cord serum C peptide levels ≥90th percentile) (Table 1). On the other hand, among Asians, NICE criteria diagnosed more women with GDM (16.7% vs. 13.8%, \( p < 0.001 \)) without identifying more women with adverse pregnancy outcomes. Among the whites, IADPSG criteria can identify more women with LGA, while the NICE criteria identify more neonates with hyperinsulinemia (Table 1).

**Conclusion:** The result suggests that the IADPSG criteria may be more appropriate for Hispanics and Asians in the diagnosis of GDM.

**Table 1. Comparisons of the incidences of neonatal outcomes by groups among each ethnicity.**

| Category | Non-GDM by both NICE & IADPSG | GDM by IADPSG but Non-GDM by NICE | GDM by NICE but Non-GDM by IADPSG | GDM by both IADPSG & NICE | \( p \) |
|----------|-------------------------------|-----------------------------------|-----------------------------------|--------------------------|-------|
| Hispanic |                               |                                   |                                   |                          |       |
| LGA      | 27 (14.8%)                    | 24 (14.8%)                        | 24 (14.8%)                        | 29 (22.3%)               | <0.001|
| Adiposity| 81 (4.3%)                     | 79 (4.2%)                         | 76 (5.5%)                         | 86 (6.5%)                | 0.007 |
| Macrosomia| 140 (12.2%)                  | 121 (10.8%)                       | 124 (9.3%)                        | 142 (10.9%)              | <0.001|
| Hypoglycaemia| 114 (9.5%)                   | 95 (8.3%)                         | 99 (7.4%)                         | 119 (8.9%)               | <0.001|
| Asian    |                               |                                   |                                   |                          |       |
| LGA      | 92 (3.9%)                     | 69 (3.4%)                         | 95 (7.5%)                         | 116 (8.6%)               | <0.001|
| Adiposity| 69 (3.0%)                     | 50 (2.5%)                         | 50 (3.8%)                         | 81 (5.9%)                | 0.001 |
| Macrosomia| 95 (4.2%)                    | 60 (2.9%)                         | 75 (5.7%)                         | 98 (7.0%)                | <0.001|
| Hypoglycaemia| 95 (4.2%)                    | 67 (3.1%)                         | 67 (5.0%)                         | 96 (6.8%)                | <0.001|
| White    |                               |                                   |                                   |                          |       |
| LGA      | 89 (3.9%)                     | 61 (2.8%)                         | 86 (6.4%)                         | 114 (8.7%)               | <0.001|
| Adiposity| 50 (4.0%)                     | 38 (3.3%)                         | 38 (3.3%)                         | 67 (5.3%)                | 0.073 |
| Macrosomia| 60 (4.8%)                    | 38 (3.3%)                         | 38 (3.3%)                         | 59 (4.5%)                | 0.201 |
| Hypoglycaemia| 60 (4.8%)                    | 44 (3.7%)                         | 44 (3.3%)                         | 63 (4.7%)                | <0.001|

\(^*\) \( p < 0.05 \).

4. Twin pregnancies in women with gestational diabetes: Retrospective review 2016–2021

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**Abstract**

**Background:** Twin pregnancies occurred in 1.4% of NSW births (2014–2019). The Institute of Medicine (IOM 2009) has maximum weight gain recommendations for twin pregnancies: healthy weight 25 kg; overweight 23 kg; obese 19 kg, respectively.

**Aim:** To assess maternal characteristics, management and outcomes of twin versus singleton GDM pregnancies.

**Methods:** We assessed prospectively collected data for all pregnancies with GDM diagnosed by WHO 2013 criteria 1 March 2016 to 1 March 2021. Data analysed were: maternal age, gravidity/parity, pre-gestational body mass index (BMI), gestation at GDM diagnosis and delivery, oral glucose tolerance test (OGTT) results, HbA1c at GDM diagnosis, insulin therapy, caesarean birth, total maternal weight gain, neonatal hypoglycaemia and jaundice. We compared data from twin versus singleton births using \( t \)-tests and chi-square analyses (SPSS version 24). Significance \( p < 0.05 \).

**Results:** There were 36 twin births amongst 1932 GDM women (1.9%). Mean total weight gained: healthy weight (n = 16) 18.0 kg, overweight (n = 6) 14.8 kg and obese (n = 14) 12.3 kg, respectively. Data in the table are mean ± SD (range or percent).
Maternal age (years) & 31.1 ± 5.7 & 31.3 ± 5.4 & 0.83 \\
Gravida & 2.9 ± 1.8 [1–7] & 2.9 ± 1.9 [1–22] & 0.89 \\
Parity & 1.3 ± 1.3 [0–4] & 1.4 ± 1.4 [0–10] & 0.89 \\
Pre-gestational BMI (kg/m²) & 28.4 ± 6.9 & 27.0 ± 6.2 & 0.18 \\
Gestation (GDM diagnosis-weeks) & 22.5 ± 5.8 [10–32] & 23.6 ± 5.8 [3–36] & 0.25 \\
Fasting blood glucose level (mmol/l) & 5.4 ± 0.7 & 5.1 ± 0.7 & 0.73 \\
1HourBGL (mmol/l) & 10.7 ± 2.1 & 9.7 ± 1.9 & 0.59 \\
2HourBGL (mmol/l) & 8.2 ± 1.7 & 7.7 ± 1.9 & 0.75 \\
HbA1c (GDM diagnosis-%) & 5.2 ± 0.4 [4.6–7.0] & 5.2 ± 0.4 [4.1–8.7] & 0.59 \\
Insulin Rx & 44.4% & 43.9% & 1.0 \\
Gestation (delivery-weeks) & 36.0 ± 1.9 [28–38] & 38.7 ± 1.3 [28–42] & <0.0001 \\
Exceeded IOM weight gain guidelines & 11.1% & 38.9% & <0.001 \\
%Caesarean & 72.2% & 35.0% & <0.0001 \\
Birthweight & 4748 ± 776, & 2392 ± 414, 2356 ± 426 & 3294 ± 513 & - \\
Hypoglycaemia (<2.6 mmol/l) & 22.2% & 10.0% & <0.05 \\
Jaundice (phototherapy) & 19.4% & 4.9% & <0.01 \\

Conclusions: Twin pregnancies occurred more commonly in GDM pregnancies than the NSW average. GDM women with twins delivered earlier and were more likely to have a caesarean delivery, neonatal hypoglycaemia and jaundice than singleton pregnancy GDM women, but far fewer exceeded IOM total pregnancy weight gain recommendations.

References
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5. Hyperaldosteronism in pregnancy: A case control study

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Abstract
Primary hyperaldosteronism (PHA) is an increasingly identified secondary cause of hypertension. Literature regarding pregnancies in women with PHA has demonstrated poor maternal and fetal outcomes. We conducted a case-control study to compare the maternal and fetal outcomes of women with PHA (diagnosed pre or post index pregnancy) to matched women at a large metropolitan network of hospitals. Women with PHA were identified from a postnatal database (2015–2020) and their matched (1:1) controls from a database of high risk women enrolled in a previous study (2017–2019) known not to have PHA. Cases were matched for age, body mass index (BMI), booking blood pressure and where possible parity. Only women with a positive salt infusion test, singleton pregnancy and who delivered after 20 weeks gestation were included. Preeclampsia was defined by SOMANZ criteria and growth restriction as gestation adjusted fetal weight less than the fifth centile. Data analyzed with SPSS v27. Forty women were included (20 PHA and 20 controls) with no differences in age, BMI, booking blood pressure or parity. Women with PHA took a greater number of pre-pregnancy anti-hypertensive medications (4 taking epleronone) (1 medication vs. 0.5 medication, p = 0.01) but were equally prophylaxed with aspirin and/or calcium for preeclampsia (95% vs. 70%, p = 0.09). There was no difference in the overall rate, preterm or late pre-eclampsia (p < 0.05 for all). Women with PHA delivered earlier (38 vs. 38.5 weeks, p = 0.02) than controls and their babies were more likely to be admitted to neonatal intensive care (50% vs. 15%, p = 0.04). There was no difference in the women's length of stay during their delivery admission or method of delivery. Women with PHA took more antihypertensive during pregnancy and post-partum (p = 0.001). Women with PHA require more medication before, during and after pregnancy than other high risk populations. The BMI, booking blood pressure and preeclampsia prophylaxis are better predictors than the PHA for adverse maternal or fetal outcomes.

6. The P4 study: Cardiovascular health 2 years after preeclampsia versus normotensive pregnancy

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Abstract
Background: Preeclampsia (PE) increases maternal risk of hypertension and cardiovascular disease from within 10 years of the index pregnancy. However, women at increased cardiovascular risk may go undetected because data on normal blood pressure (BP) and other cardiovascular risk indices in the first 5 years postpartum is lacking. This study aims to report BP and indices of cardiovascular health in women 2 years after...
normotensive pregnancy (NP) versus PE, and compare these with measures from the same women at 6 months postpartum.

**Methods**: Prospective cohort with paired measures of 114 NP and 51 PE pregnancies 6 months and 2 years postpartum. Measures included manual, central and 24-h ambulatory BP; radial artery applanation tonometry, HOME-IR score, albumin-creatinine ratio (ACR), and echocardiography in a subgroup. Provisional reference intervals for normal BP at 2 years postpartum were derived from the NP group. Groups were compared using usual quantitative methods. Paired testing was used to compare 6-month and 2-year data.

**Results**: At 2 years postpartum, PE had significantly higher manual (111 ± 12/72 ± 8 mmHg vs. 103 ± 10/66 ± 7 mmHg), central (103 ± 12/75 ± 9 mmHg vs. 96 ± 10/68 ± 7 mmHg) and 24-h average BP (116 ± 9/73 ± 8 mmHg vs. 106 ± 8/67 ± 6 mmHg) compared to NP (all \(p < 0.001\)). There was no difference between 6 months and 2 years postpartum within each group. Two percent of PE were hypertensive at 2 years using the traditional reference range of \(\geq 140/90\) mmHg for manual BP; compared to 19.6% when utilising the novel reference interval derived from the NP group. There was no difference between groups in HOME-IR score, ACR or echocardiographic parameters at 2 years postpartum.

**Conclusion**: PE had higher BP at 2 years postpartum compared to NP, predicted by the 6 months findings. Utilising a normal range derived from the NP group detected hypertension in a greater proportion of PE women than traditional reference ranges, which may have implications for risk stratification in high-risk women.

### 7. Diabetes in pregnancy and technology – Practical tips

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**Abstract**

The ongoing advances in diabetes technology in insulin delivery as well as in glucose monitoring are facilitating glycaemic management as well as improving quality of life and reducing the burden of living with diabetes. However, management of women with type 1 diabetes in pregnancy remains challenging. The need for targeting tight glycaemic control, the ever changing insulin requirements and additional issues when morning sickness or gastroparesis are present require alterations in the usage of technology during pregnancy. Insulin pump therapy may assist in achieving better glycaemic control, reduce glycaemic excursions and improve quality of life. It is not the preferred mode of insulin delivery for all though and requires appropriate training and active engagement of the woman with diabetes for both optimal and safe usage. In addition, it is not affordable for many. It also carries risk for ketoacidosis, which is a significant concern in pregnancy. It has not clearly been shown to lead to better pregnancy outcomes. Predictive insulin mono- and auto-mode are additional issues now requiring consideration. Continuous glucose monitoring (CGM) in conjunction with fingerprick glucose testing has been shown in the CONCEPTTT study to lead to better pregnancy outcomes compared to fingerprick testing alone. The CONCEPTTT data led to the Commonwealth Government providing fully subsidised access to CGM for women with type 1 diabetes starting pre-pregnancy and continuing till 3 months after due delivery date. All forms of diabetes technology require appropriate patient education and support. Diabetes technology is very time demanding for diabetes health professionals particularly during pregnancy when contact/review is required mostly weekly for assessment and decisions on glycaemic management.

### 8. Gestational diabetes mellitus (GDM) care re-imagined – 1: Integration of a digital solution into a radical model of care change

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**Abstract**

**Introduction**: The rising prevalence of gestational diabetes mellitus (GDM) continues to be a major issue in the efficient and timely provision of diabetes care at our maternity facilities. Mater Mothers’ Hospital (MMH) is a large quaternary maternity centre servicing a culturally and linguistically diverse population. Local GDM frequency is approximately 16% of maternities, amounting to over 1000 women with GDM per annum. We present elements of the steps and outcomes of an iterative process for redesigning GDM care using novel strategies. This incorporates a digital solution in trial at MMH since June 2020, removing the traditional ‘GDM schedule’ in favour of a streamlined digital review schedule.

**Method**: MMH, in collaboration with CSIRO, have implemented a smartphone app with Bluetooth transfer of blood glucose levels (BGLs) from the woman’s home glucose meter and real-time BGL transmission to a clinician-facing web portal. Text messaging is used for feedback and insulin titration. The larger and more complex component of the project includes the associated model of care changes required to make the digital interface time and resource efficient.

**Results**: Over 1000 women have received care through the novel GDM model of care. Initial informal feedback reveals: far greater visibility of the patient cohort and early recognition of patients with highest care needs. Improved staff satisfaction for workflow, reduced requirement for initiation of insulin (40%–30%) and improved patient satisfaction and experience. App use compliance increased from 60% to 97% in the first 6 months. Clinical outcome data is under evaluation.

**Conclusion**: A mobile health solution integrated into a radical model of care change demonstrates positive initial feedback and outcome data.

**Keywords**: GDM, Smartphone App, digital, mHealth, model of care

The authors have presented three interlinked abstracts for consideration:

1. Gestational diabetes mellitus (GDM) care re-imagined – 1: Integration of a digital solution into a radical model of care change.
2. Gestational diabetes mellitus (GDM) care re-imagined – 2: Education and clinical review delivery to support a radical model of care change.
3. Insulin wastage in GDM – is sustainability a pipe dream?

**GRANT**: ADIPS – Clinical Education Research (2019).
9. Fetal ultrasound scans to guide management of gestational diabetes: Improved neonatal outcomes in routine clinical practice

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Abstract
Objective: At a given level of glycemic control, fetal growth is variable in gestational diabetes mellitus (GDM). Some guidelines recommend altering glycemic targets in GDM based on ultrasound measurements of fetal growth, but the impact on outcomes in clinical practice is unknown. The aim of this study was to compare the effects of ultrasound-guided and non-ultrasound-guided management on neonatal outcomes.

Methods: This was a retrospective, observational study of women with GDM and their infants. The study sample was randomly selected from all eligible women who delivered at the study hospital from August 2015 to August 2019. Outcomes were compared between those who had GDM management tailored according to fetal growth and those who did not.

Results: In the sample of 221 women, 134 had documentation of ultrasound-guided management while 87 did not. There was no significant difference in size-for-gestational age between groups. Fewer neonates in the ultrasound-guided management group were admitted to the Special Care or Intensive Care Nursery (29.1% vs. 48.3%, p = 0.004), had a prolonged hospital stay (3.7% vs. 13.8%, p = 0.006), or had hypoglycemia after birth (42.5% vs. 56.3%, p = 0.045). The reduction in admission rates and prolonged hospital stays remained significant after controlling for confounding variables.

Conclusions: Ultrasound-guided management was independently associated with reductions in Special Care Nursery and Intensive Care Nursery admissions and neonatal length of stay despite no significant differences in birthweight.

10. Accuracy of continuous glucose monitoring during periods of predicted acute glycaemic variability in pregnancy in women with Type 1 diabetes mellitus in the inpatient setting: A pilot study

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Abstract
Background: Subcutaneous continuous glucose monitors (CGM) use during pregnancy in ambulant women with Type 1 diabetes mellitus (T1DM) improves glycaemic control and neonatal outcomes. Women may require intensive inpatient glycaemic management during glucocorticoids, intercurrent illness or intrapartum to reduce maternal–foetal risk. CGM has the potential to enhance glycaemic monitoring during these episodes and improve maternal experience by minimising capillary glucose ‘finger-prick’ testing. The accuracy of CGM during episodes of acute glycaemic variability has not been evaluated in pregnancy.

Methods: Observational, retrospective study of pregnant women with T1DM using CGM whilst on IV insulin infusion with 30 to 60 minutely capillary glucose (CapG) monitoring. CapG was paired with nearest time-point CGM glucose.

Results: Data available for 11 episodes (intercurrent illness = 3, intrapartum = 8). Median gestation was 37 weeks; CGM Dexcom 5 (n = 9) and Carelink (n = 2). Pearson’s correlation for CGM and CapG was 0.80 (p < 0.005) for n = 256 paired data points (Figure 1). Overall accuracy of CGM compared to CapG was reasonable, with mean absolute relative difference (MARD) 11.4% (SD 11.6) for n = 256 data points. MARD calculated for each episode ranged from 1.1% to 32.8% (median 11.9%, IQR 6.59) (Figure 2). Significant positive correlation between increasing CV% of CapG and MARD (Spearman rho = 0.68, p = 0.02) and positive correlation between increased rate of change of CapG and increased CapG to CGM glucose (linear regression coefficient 0.69, p < 0.005). No apparent correlation between MARD and number of data points or number of calibrations. In 5/10 capillary-detected hypoglycaemic events (glucose < 3.8mmol/l), CGM levels lagged behind, with up to 70% difference between CGM and CapG in this range (red box, Figure 1); six hypoglycaemic events occurred during one admission.
Conclusion: Capillary glucose and CGM were reasonably correlated during IVI in pregnancy. Rate of change of glucose may predict discrepancy between capillary and CGM glucose. Further study of accuracy of CGM under glycaemic extremes in pregnancy is planned in prospective studies.

11. Progression of diabetic retinopathy and its risk factors in pregnant women with pre-existing diabetes in Metropolitan Melbourne

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Abstract

Purpose: Diabetic retinopathy (DR) may deteriorate during pregnancy, although findings from prior studies have been conflicting and many are outdated. Here, we report DR prevalence, progression rate and associated risk factors in pregnant women with pre-existing diabetes.

Methods: Pregnant women with type 1 diabetes mellitus (T1DM) or type 2 diabetes mellitus (T2DM) were prospectively recruited from two maternity hospitals in Melbourne (November 2017–September 2019). Eye examinations were scheduled in each trimester and 3 months postpartum. DR severity was graded from retinal photographs. At least 2 examinations were scheduled in each trimester and 3 months postpartum. Progression was defined as worsening of DR severity, development of diabetic macular oedema, or the need for laser treatment during pregnancy.

Results: Among the 144 eyes (72 women) with >1 eye examination, 9.7% (95% CI 3.8–15.8) progressed. Elevated systolic blood pressure (risk ratio 10.36, 95% CI 3.14–34.12) and pre-existing DR in either eye (RR 5.07, 95% CI 1.90–13.49) in early pregnancy significantly increased the risk of progression. Type of diabetes was not associated with a greater risk of progression (p = 0.141). Sight-threatening disease was observed in 6 eyes (5 women).

Conclusions: Nearly 1 in 10 eyes had DR progression in pregnancy, with almost half of these developing sight-threatening diseases. Risk factors included hypertension and pre-existing DR in early pregnancy. Worrisomely, 1 in 5 participants did not attend any eye examinations during pregnancy, highlighting the need to address barriers to adherence given the significant risk of worsening DR.

12. Dietetic service provision for gestational diabetes mellitus in Australia: What has changed in 10 years? Findings comparing two national surveys

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Abstract

Aims: Examine current Australian dietetic service provision for GDM by comparing findings to a previous survey1 and to the American Academy of Nutrition and Dietetics Nutrition Practice Guidelines.2

Methods: A survey of dietitians providing Medical Nutrition Therapy to women with GDM in Australia was conducted in 20093 and repeated in 2019. This abstract compares responses to service provision questions.

Results: A total of 149 and 220 dietitians met inclusion criteria in the 2019 and 2009 surveys, respectively. Not all questions were answered by all respondents. Most respondents reported that women attending their service with GDM were referred to a dietitian in both 2019 and 2009 surveys, respectively (83% and 77%; NS). More respondents provided their service with GDM were referred to a dietitian in both 2019 and 2009 surveys, respectively. Not all questions were answered by all respondents.

A total of 149 and 220 dietitians met inclusion criteria in the 2019 and 2009 surveys, respectively. Not all questions were answered by all respondents. Most respondents indicated that women received only one dietetic intervention (49% vs. 33%; p<0.001). Fewer respondents indicated that women received one dietetic intervention in 2019 compared to the 2009 survey (13% vs. 31%; p<0.0001). Although less than a half of dietitians provided the minimum of three dietetic visits (including group education) stipulated in the guidelines2 in 2019, this was an increase compared to the 2009 survey (49% vs. 33%; p<0.001). When respondents were asked to describe how their dietetic service is attempting to meet any increase in GDM clinical workload following uptake of the International Association of the Diabetes and Pregnancy Study Groups (IADPSG) GDM diagnostic criteria, the most common responses were: increased use of group education (25%); increased clinic time through reallocation of existing services (22%); increase in funded dietetic time (11%); and reduction or omission of individual review visits (7%). When asked whether their service provided adequate dietetic intervention for GDM, 42% in 2019 selected yes, down from 54% in 2009 (NS).

Conclusions: Dietetic service provision for GDM in Australia continues to fall short of evidence-based recommendations. Increased workload has necessitated changing models of care and made provision of adequate GDM dietetic interventions even more challenging.
13. Maternal predictors of small for gestational age infants in gestational diabetes mellitus pregnancies

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Abstract
Background: Gestational diabetes mellitus (GDM) management reduces the risk of large for gestational age infants and neonatal hypoglycaemia. Maternal risk factors for small for gestational age (SGA) within GDM populations are conflicting.
Aim: To evaluate maternal predictors for SGA in GDM pregnancies in a multiethnic GDM cohort.
Methods: Deidentified prospectively collected data were analysed from our database for singleton births in GDM women diagnosed by International Association of the Diabetes and Pregnancy Study Groups (IADPSG) criteria between years 2016 and 2020 at Bankstown-Lidcombe Hospital. Management included diet, with initiation of insulin if optimal targets were not achieved (fasting BGL <5.3 mmol/l; 1-h post-prandial BGL <7.4 mmol/l; 2-h post-prandial BGL <7.7 mmol/l). SGA was defined as <10th percentile. Maternal characteristics assessed included: pre-pregnancy body mass index (BMI), parity, weight gain by initial clinic visit, including insufficient weight gain based on Institute of Medicine recommendations, total pregnancy weight gain, ethnicity, early GDM diagnosis, fasting blood glucose level on oral glucose tolerance test (OGTT) and use of insulin therapy. Pregnancy outcomes including caesarean section, early delivery (<37/40), neonatal hypoglycaemia and jaundice were assessed in SGA infants. Covariates significant on univariate analyses (p < 0.05) were used for backward-stepwise logistic regression.
Results: A total of 1735 GDM pregnancies were included in this analysis. Overall SGA prevalence in our cohort was 8.4%. Multivariable analysis identified insufficient weight gain at GDM presentation (adjusted odds ratio (aOR) 1.42; 95% CI 1.02–1.97) and non-Middle Eastern ethnicity as independent positive predictors for SGA (aOR 1.66; 95% CI 1.07–2.56). Use of insulin therapy (aOR 0.55; 95% CI 0.39–0.79) was associated with a lower rate of SGA. Other assessed variables were not significant risk factors for SGA following multivariable analysis. There were more pre-term deliveries (13.1% vs. 5.5%; p < 0.001) but no significant differences in caesarean section rate or other outcomes in SGA neonates.
Conclusions: Insufficient weight gain at the initial GDM assessment was a risk factor for SGA. Women of Middle Eastern background had a significantly lower rate of SGA.

14. Epilepsy in pregnancy

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Abstract
This talk will focus on the complex management of women with epilepsy during their pregnancy, in order to optimize outcomes for both the mother and baby. The talk will focus on balancing the risks of uncontrolled seizures and the risks of anti-seizure medications. The talk will cover the risks of uncontrolled seizures; the risks of anti-seizure medication exposure to the foetus; and suggestions on management to optimize outcomes. With regard to risks of uncontrolled seizures, the talk will focus on the maternal and fetal risks; the impact of pregnancy on seizure control; and the impact of anti-seizure medication pharmacokinetics on seizure control. In terms of risks of anti-seizure medications, the talk will focus on effects on fetal growth; major congenital malformations; and developmental and behavioural outcomes. Finally, the talk will discuss suggestions for management, in order to optimize outcomes during the pre-conception period, pregnancy, and the post-partum period.

16. Pregnancy in women with MS

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Abstract
Multiple sclerosis (MS) is an autoimmune disease increasing in incidence and prevalence. It affects women 3 times more than men and is often diagnosed at childbearing age. While previously neurologists recommended their patients not to fall pregnant there is now mounting evidence that pregnancy has a positive effect on the disease course. The protective effect of pregnancy especially in the third trimester has been described already in the 1990s. After the introduction of highly efficacious treatments, which are recommended to be stopped prior to pregnancy, this picture has changed, and we see now more relapses in the third trimester. There is still an increased risk of relapse post-partum, but this is diminished if patients were stable on therapy for the two years prior to pregnancy. Especially highly active patients are likely to be treated up to the first trimester with potential implications for the baby (anemia and thrombocytopenia for Natalizumab and hypoglycaemia for Occlurelum). There is still a question around impaired fecundity in women with MS with multiple factors potentially effecting the ability to fall pregnant including disease symptoms and treatment or disease-specific immune dysregulations. There seems to be an increased use of artificial reproductive technology in women with MS but evidence is scarce. The mode of ART is also still debated with GnRH agonists potentially increasing the risk of relapse. As the stress of failed cycles and the delay in restarting disease-modifying therapy are confounding factors, even a recent meta-analysis was too small to answer this question. Therefore, family planning in women with MS is complex and requires the input of a neurologist, general practitioner and obstetrician.

17. Outcomes of pregnancies to women with cystic fibrosis in South East QLD

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Abstract
Multiple factors potentially effecting the ability to fall pregnant including disease symptoms and treatment or disease-specific immune dysregulations. There seems to be an increased use of artificial reproductive technology in women with MS but evidence is scarce. The mode of ART is also still debated with GnRH agonists potentially increasing the risk of relapse. As the stress of failed cycles and the delay in restarting disease-modifying therapy are confounding factors, even a recent meta-analysis was too small to answer this question. Therefore, family planning in women with MS is complex and requires the input of a neurologist, general practitioner and obstetrician.
Introduction: Aims: To discuss how we can better utilize data captured as part of routine clinical care to gain insights that impact pregnancy outcome and whether it declines compared to a control group. Foetal and maternal outcomes will also be evaluated to assess the risk of pregnancy and improve prenatal counselling for future pregnancies.

Methods: We have undertaken a multisite retrospective chart audit of pregnancies over a 10-year period from 2006 to 2016 for women with CF.

Aim: The intention of this study was to assess the impact of diabetes on pregnancy outcomes for women with CF.

Results: Thirty-eight pregnancies amongst 26 women were identified. Two women had previously had a lung transplant. Seventeen pregnancies were primiparous and one was a twin pregnancy. Five women had CF-related diabetes (CFRD) diagnosed prior to pregnancy. A further 12 women had 15 pregnancies complicated by gestational diabetes mellitus (GDM). The average gestational age of delivery was 36 weeks. CFRD and GDM were associated with higher rates of preeclampsia (CFRD 60%/44%, GDM 0/0), delivery complications, prematurity (80%/60%/44%), neonatal intensive care unit (NICU) admission (80%/47%/28%), neonatal hypoglycaemia and neonatal respiratory distress.

Conclusions: Diabetes is common during pregnancy in women with CF and appears to have an impact on pregnancy outcomes. Ideally, collation of data in a national cohort would allow tracking and reporting of pregnancy outcomes for this cohort of women who have a high risk of adverse pregnancy outcomes.

19. Developing digital health technologies in obstetric practice: GDM-health – a case study

Lucy Mackillop

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Abstract: We have been promised a revolution in healthcare with the adoption of digital technologies. So where are we with digital transformation and what are the opportunities and barriers, particularly in the practice of medical problems in pregnancy?

Objectives:
- To understand the speed of growth of digital health applications worldwide.
- To understand drivers and barriers for digital adoption.
- To use a case study to illustrate the process (trials and tribulations) of developing a digital health application.
- To discuss how we can better utilize data captured as part of routine clinical care to gain insights that impact pregnancy outcome and health after pregnancy?

20. Bariatric surgery: An update and its impact on fertility

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Abstract: Aims: To provide an update on local current trends in bariatric surgery as well as outline the impact of bariatric surgery on fertility and pregnancy outcomes.

Discussion: Obesity is an epidemic that is the leading cause of preventable death worldwide. It affects more than 60% of Australian adults with the majority suffering from an array of comorbidities, including infertility in both males and females. This talk will outline the different forms of weight loss surgery currently available in Australia, their indication and potential complications. It will explore the pathophysiology of infertility in the obese as well as how this is reversed with weight loss, resulting in a significant increase in both spontaneous and assisted pregnancy in this patient population. Lastly, it will address current evidence relating to pregnancy outcomes. Specifically, this will address maternal complications, fetal risks and outcomes, and recommendations in perinatal care.

Conclusion: It is hoped that this will act as a comprehensive guide to assisting obese patients, both pre- and post-surgery, with their fertility journey.
21. Diagnosis and management of maternal hyperglycaemia after bariatric surgery – Balancing risks and benefits

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Abstract

Bariatric surgery is an effective and increasingly used treatment modality for severe obesity and its complications including diabetes mellitus. It is clearly more effective than intensive lifestyle interventions in achieving sustainable weight loss and is associated with >50% remission of known pre-existing diabetes. In addition to remission of diabetes, other comorbid conditions including hyperlipidaemia, hypertension and obstructive sleep apnoea are improved after bariatric surgery. Some of the improvement in glucose metabolism following bariatric surgery occurs very rapidly, before the time of major weight loss and may relate to marked caloric restriction, improved insulin secretion and variable improvements in peripheral insulin resistance and hepatic glucose production. The function of the incretin system (Glucagon-Like Peptide 1 and Gastric Inhibitory Polypeptide) is also enhanced following bariatric surgery. Conventional oral glucose tolerance test (OGTT) diagnosis of gestational diabetes mellitus (GDM) is rarely feasible or useful following malabsorptive bariatric surgery and its utility after gastric sleeve procedures is debated. Major issues include variable gastric emptying, poor tolerance of the OGTT solution and hypoglycaemia during the test. A variety of bodies have produced consensus recommendations regarding diagnosis of GDM following bariatric surgery, often promoting use of HbA1c and home glucose monitoring (or continuous glucose monitoring if available) but none has a firm evidence base. Whilst there is a clear consensus in favour of treating ‘diabetes level’ hyperglycaemia in pregnant women with previous bariatric surgery, the value of treating GDM is less clear and the potential reduction in excess foetal growth must be balanced against the risk of growth restriction. Many aspects of the detection and treatment of hyperglycaemia during pregnancy in women with previous bariatric surgery remain contentious and further research should be a major priority.

24. Childhood metabolic outcomes following gestational diabetes

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Abstract

There has been increasing focus on the developmental origins of long-term health and disease, with numerous examples of exposure to diabetes during pregnancy begetting obesity and more diabetes. An open question is whether exposure to lesser degrees of hyperglycaemia during pregnancy is associated with adverse metabolic outcomes in children. This question was addressed in the Hyperglycaemia and Adverse Pregnancy Outcome (HAPO) Follow-Up Study (FUS). Metabolic outcomes were assessed in children 10 to 14 years old following the HAPO pregnancy, comparing outcomes in offspring of mothers with gestational diabetes mellitus (GDM) diagnosed using International Association of Diabetes and Pregnancy Study Groups (IADPSG) criteria to those in offspring of mothers with normal glycemia during the HAPO pregnancy. Offspring of GDM mothers had a higher risk of obesity and greater adiposity. The association of GDM with childhood glucose outcomes was also examined. GDM was associated with higher levels of childhood 30 min, 1 h, and 2 h glucose levels during an oral glucose tolerance test as well as greater insulin resistance and a lower disposition index. Finally, GDM was associated with the development of impaired glucose tolerance but not impaired fasting glucose during childhood. Similar to the linear association of maternal glucose with newborn outcomes in the HAPO study, there was a similar linear relationship between maternal glucose levels and childhood adiposity and glucose outcomes. Finally, given the association of maternal hyperglycaemia during pregnancy with a higher risk of macrosomia, the association of size at birth with childhood glucose outcomes was examined. After adjusting for maternal glucose levels, higher birthweight and newborn sum of skinfolds were associated with lower fasting and post-load glucose values during an oral glucose tolerance test as well as lower insulin sensitivity. In conclusion, offspring of mothers with GDM diagnosed using IADPSG criteria have higher glucose levels and greater adiposity at age 10 to 14 years, but the interplay between maternal metabolism during pregnancy, size at birth and childhood glucose outcomes is complex.

25. Improving care for diabetes in pregnancy in regional and remote Australia

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Abstract

Aboriginal and Torres Strait Islander women are disproportionately impacted by hyperglycaemia in pregnancy. There are multiple barriers to providing care for women with hyperglycaemia in pregnancy in regional and remote Australia, including high staff turnover, fragmentation between services, limited clinician confidence, and lack of clarity around clinician roles relating to service provision. The Diabetes Across the Lifecourse: Northern Australia Partnership (formerly the Northern Territory and Far North Queensland Diabetes in Pregnancy Partnership) is a collaboration between researchers, clinicians and policymakers. Since 2011 in the Northern Territory and 2015 in Far North Queensland, the Partnership has worked to improve systems of care for women with hyperglycaemia in pregnancy, addressing identified barriers to care and opportunities for improvement. Activities of the Partnership include clinician education, updating relevant guidelines and policies and embedding these in practice, improving of recall and reminder systems, and implementing a Diabetes in Pregnancy Clinical Register for epidemiological and quality improvement purposes. The establishment of an Indigenous Reference Group, providing an Aboriginal voice that guides priority-setting and culturally safe research practices, has been key to the Partnership’s work. The Partnership has led to improved communication between care providers and increased clinician knowledge and confidence in managing hyperglycaemia in pregnancy. Clinicians also report a greater emphasis on care being patient-centred, with more flexibility for women to choose the location of their care and clinicians placing a higher priority on effective cross-cultural communication. Currently, the Partnership is working with Aboriginal and Torres Strait Islander women, families and communities to co-design improved supports for women and families impacted by hyperglycaemia in pregnancy. Additionally, on the advice of the Partnership’s Indigenous Reference Group, the work of the Partnership has expanded to include young people with type 2 diabetes, acknowledging the intergenerational impact hyperglycaemia in pregnancy has on Aboriginal and Torres Strait Islander communities.

26. The growing challenge of intergenerational diabetes

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Abstract

Aboriginal and Torres Strait Islander women across Australia experience high rates of diabetes during pregnancy. In the Northern Territory, there is an epidemic of type 2 diabetes among Aboriginal people, with disease onset seen at increasingly young ages. This is accompanied by increasing
rates of diabetes during pregnancy, which is impacting birth outcomes and the metabolic health of the next generation. The growing burden of chronic disease among Aboriginal people is strongly related to the social determinants of health and numerous challenges need to be addressed to improve outcomes. Strategies to address the intergenerational cycle of adverse metabolic health need to be developed and implemented in partnership with Aboriginal communities, with consideration of barriers such as food insecurity, overcrowded housing and other competing priorities relating to social disadvantage. Qualitative research into Aboriginal women’s experiences of diabetes in pregnancy has highlighted the need for culturally and linguistically appropriate health information, the value of pregnancy as a motivator for behaviour change and the importance of culturally safe, family-centred care, underpinned by respectful relationships with consistent clinicians. In research focused on the post-partum period, enablers for improving health included strong connections to family, community and country.

27. An opportunity for primary care prevention of T2DM development post gestational diabetes

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Abstract

Background: The Goulburn Valley Health (GVH) Diabetes Centre provides acute and subacute diabetes care in the Goulburn Valley and its surrounding, including gestational diabetes mellitus (GDM) management. The current model of care at GVH is GDM management upon diagnosis with service discharge following delivery. There is no follow-up prevention program currently available for this cohort of women at signification of culturally safe, family-centred care, underpinned by respectful relationships with consistent clinicians. In research focused on the post-partum period, enablers for improving health included strong connections to family, community and country.

Methods: A literature review was conducted to benchmark current rates of T2DM post-GDM in Australia, and identify associated risk factors. A file audit was undertaken to identify demographic characteristics and pregnancy outcomes for three cohorts of women with GDM across 10 years. Descriptive statistics were undertaken to describe the cohorts and identify changes over time. Results were compared to the benchmarked literature. A simple survey regarding currently available T2DM programs post GDM were distributed to 11 Victorian healthcare facilities (8 regional and 3 metropolitan). Results: N = 386 women were included in the audit with a mean age of 31.7 years at diagnosis, mean antenatal body mass index (BMI) of 31.8 kg/m², n = 89 (23%) of whom experienced a GDM recurrence. The cohort was culturally diverse with n = 138 (36.1%) born overseas and n = 18 (4.7%) Aboriginal or Torres Strait Islander and the majority (n = 254; 66%) resided within Greater Shepparton. Over the 10 years, service demand increased by 74% and the number of insulin initiations increased by 90%. The proportion of women with a BMI >30 kg/m² significantly increased between 2015 and 2020. Of the 64% of health services who responded to the survey 3 reported provision of a postnatal T2DM prevention program.

Conclusion: A significant gap in the current management of post-natal GDM in Victorian public health currently exists. There is a high need for the implementation of a postnatal T2DM prevention program in Greater Shepparton. Considering the culturally diverse population serviced in the region, key consumer groups will need to be engaged in program co-design prior to implementation to optimize program reach and potential impact in preventing T2DM.

28. Determining the course of diabetic retinopathy in the postpartum in women with type 1 and type 2 diabetes in metropolitan Melbourne

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Abstract

Purpose: Diabetic retinopathy (DR) in the postpartum remains poorly understood. This study explores the prevalence, typical DR course and risk factors for DR progression in the postpartum.

Methods: Subgroup analysis of a prospective cohort study of pregnant women with Type 1 diabetes mellitus (T1DM) or Type 2 diabetes mellitus (T2DM) attending two maternity hospitals in Melbourne. Participants had ≥1 eye examination during both pregnancy and up to 12 months postpartum. DR severity was determined through grading of retinal photographs or clinical assessment when photographs were unavailable. Progression was defined as worsening by ≥1 step on the Airline House classification, development of diabetic macula oedema or the need for laser treatment.

Results: Eighty-seven pregnancies from 86 women were included; 48 had T1DM and 38 had T2DM (median duration 18.0 and 4.0 years, respectively). The mean age was 33.4 years (range 21–47). Prevalences of DR and sight-threatening DR (STDR) at 14–26 weeks postpartum were 23.1 (CI 14.5–34.6) and 14.6 (CI 7.2–27.2) per 100 eyes, respectively.
Between late pregnancy and 12 months postpartum, progression occurred in 20/160 (13%) eyes while 10/160 (6%) regressed. Progression was more common in the latter 6 months postpartum and associated with existing baseline DR, T1DM (RR 5.03, 95% CI 1.52–16.70) and duration of diabetes >10 years (RR 3.52, 95% CI 1.38–8.21). Of 13 eyes that progressed during pregnancy, 5 (38%) regressed in the postpartum. Regression was seen in 4/5 (80%) eyes that developed new DR in pregnancy and 0/5 (0%) eyes with proliferative DR (PDR).

Conclusion: Postpartum DR and STDR prevalence were comparable to the non-pregnant diabetic population. Postpartum progression was twice as common as regression, highlighting the importance of postpartum eye screening. Existing baseline DR, T1DM and duration of diabetes >10 years were risk factors. The majority of eyes that progressed during pregnancy did not regress in the postpartum, especially eyes with PDR.

29. Type 2 diabetes in pregnancy: An analysis of 20 years’ experience of pregnancy and pregnancy outcomes

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Abstract
Background/aims: To explore the demographics, management and complications experienced by women with pre-existing type 2 diabetes mellitus (T2DM) during pregnancy over a 20-year period.
Methods: A retrospective review of all pregnancies (n=555) of women with T2DM (n=418) who received antenatal care at Royal Women’s Hospital between 2000 and 2019 inclusive. Data were recorded in the Diabetes in Pregnancy database, exported to excel and analysed using SPSS.
Results: Over 20 years there were 555 pregnancies in 418 women with 534 pregnancies progressing beyond 20 weeks’ gestation. Maternal age increased, with the average age of pregnancy being 34 (SD±6.4) years. The average body mass index (BMI) at the initial antenatal visit was 33 kg/m². Pre-eclampsia complicated 62 pregnancies (12%), with the incidence of pre-eclampsia increasing over the 20-year time period. Antenatal aspirin and folate use increased, with aspirin rising from 11% in 2000–2004 to 47% in 2015–2019, and antenatal folate use increasing from 43% to 74% over the same period. Of the 534 continuing pregnancies there were 14 stillbirths and three neonatal deaths. Fifty-nine percent of deliveries were by caesarean section. Preterm delivery occurred in 133 (25%) pregnancies. The rate of special care nursery (SCN) admission decreased over the 20-year period from 64% to 37%. Congenital malformations occurred in 53 pregnancies (10%). Mean HbA1c decreased over the course of pregnancy (first trimester = 7.42%, second trimester = 6.4%, third trimester = 5.9%), there was no difference in HbA1c over the time periods. Eighteen percent of women attended the pre-pregnancy clinic, these women had an average first trimester HbA1c of 7.0%. Antenatal metformin use increased.
Conclusions: Pregnancy in women with T2DM continues to be associated with significant complications for both women and their neonates. Despite the increased use of metformin, aspirin and folate some pregnancy outcomes have not discernibly improved. Emphasis should be placed on the availability of effective pre-pregnancy care.

30. Early pregnancy glycated haemoglobin identifies Australian Aboriginal women with high-risk of gestational diabetes mellitus and adverse perinatal outcomes

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Abstract
Objective: To assess whether an early pregnancy glycated haemoglobin (HbA1c) can predict subsequent gestational diabetes mellitus (GDM) and adverse birth outcomes in Australian women.
Research design and methods: Prospective study of women aged over 16 years, without confirmed diabetes, with a first antenatal visit before 20 weeks gestation. Recruitment was from 27 primary health care sites in rural and remote Australia from 9 January 2015 to 31 May 2018. HbA1c was measured with first antenatal investigations (<20 weeks gestation) and compared to routine 75 g oral glucose tolerance test (OGTT; ≥24 weeks gestation) and birth weight for gestational age. The primary outcome measure was the predictive value of early HbA1c for GDM and large for gestational age (LGA) newborns.
Results: Of 466 women with an early HbA1c, 396 (129 Aboriginal) had a first antenatal visit before 20 weeks gestation. Recruitment was from 27 primary health care sites in rural and remote Australia from 9 January 2015 to 31 May 2018. HbA1c was measured with first antenatal investigations (<20 weeks gestation) and compared to routine 75 g oral glucose tolerance test (OGTT; ≥24 weeks gestation) and birth weight for gestational age. The primary outcome measure was the predictive value of early HbA1c for GDM and large for gestational age (LGA) newborns.
Results: Of 466 women with an early HbA1c, 396 (129 Aboriginal) had a routine OGTT with 28.8% GDM incidence (24.0% Aboriginal). HbA1c ≥5.6% (≥38 mmol/mol) was highly predictive (71.4%, 95% CI 47.8–88.7%) for GDM in Aboriginal women, and in the total cohort increased risk for LGA newborn compared to women below this threshold and without GDM (RR 2.04, 95% CI 1.03–4.01, P=0.040). There were clear differences between groups, with 16.3% of Aboriginal women having early elevated HbA1c and another 12.4% developing hyperglycaemia during pregnancy, compared to only 5.2% and 29.6%, respectively, for non-Aboriginal women.
Conclusions: Early pregnancy HbA1c ≥5.6% (≥38 mmol/mol) appears to identify Aboriginal women who had hyperglycaemia prior to pregnancy (apparent prediabetes) and elevated risk of having an LGA newborn. Universal HbA1c at first antenatal presentation could lead to earlier management of hyperglycaemia and improved perinatal outcome in this high-risk population.

31. Familial hypercholesterolemia in pregnancy: Case series

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32. “What do you want to know and how do you want to know about it?” Consumer perspectives of pregnancy counselling and education in women with kidney disease: a national survey

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Abstract
Background: Knowledge about best approaches for pregnancy counseling in women with chronic kidney disease (CKD) and their experiences is currently limited.

Methods: A national survey assessing experiences and preferences was promoted to women ≥18 years with CKD of any stage via social media, patient and clinical networks (December 2020 to April 2021).

Results: A total of 71 women participated. 73.1% of women were aged 25 to 45 years, majority were from an English-speaking background (81.6%) and living in a metropolitan area (59.1%). Discussions around pregnancy were most often initiated by women themselves (57.4%) compared to their kidney specialists (27.7%). Of note, 14.8% of respondents stated they had only received pregnancy counselling after they became pregnant. Women felt very comfortable (50.7%) or comfortable (32.4%) to have pregnancy counselling with their kidney specialists (27.7%). Of note, 14.8% of respondents stated they had only received pregnancy counselling after they became pregnant. Women felt very comfortable (50.7%) or comfortable (32.4%) to have pregnancy counselling with their kidney specialists (27.7%).

Conclusion: Women with kidney disease have had diverse experiences of pregnancy counselling, with essential information not being conveyed to over a third of women. Women felt very comfortable (50.7%) or comfortable (32.4%) to have pregnancy counselling with their kidney specialists (27.7%).

33. Ustekinumab levels in pregnant women with inflammatory bowel disease and neonates exposed in-utero

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Abstract
Introduction: Ustekinumab (UST) is increasingly used in the management of inflammatory bowel disease (IBD). While UST use during pregnancy is likely to be safe, pharmacokinetic data in pregnancy and in exposed infants is limited.

Aims/methods: The aim was to establish the stability of UST levels antenatally, the ratio of infant to maternal UST levels at delivery and the time to clearance from the infant. Women receiving UST for IBD prior to conception or when pregnant were prospectively recruited. Maternal trough UST levels were measured in each trimester and at delivery where possible. Infant UST levels were measured from the umbilical cord at delivery and repeated between 6 and 9 weeks of age. In infants with detectable UST levels, further testing was performed to determine the time to clearance.

Results: Ten participants, all with Crohn’s disease, with at least two antenatal or matched infant/maternal delivery UST levels were receiving UST every 8 weeks in 7, 6 weeks in 1 and 4 weeks in 2. All were in clinical remission, but only had biochemical evidence of disease activity. No babies were born prematurely, with a median gestational age of 38.5 weeks (IQR 38.0–39.0). The birth weight was 3246 (2810–3480) g. One minor congenital heart defect was noted. Trough UST levels (µg/ml) were 2.3 (range 1.3–2.4) in trimester 1 (n = 3), 2.2 (IQR 1.6–2.3) in trimester 2 (n = 7) and 1.8 (1.6–3.3) in trimester 3 (n = 4), with no significant difference over the course of pregnancy (p = 0.29) (Figure 1). Infant and non-trough maternal UST levels (µg/ml) at delivery were 4.0 (1.2–7.8) and 1.4 (0.7–4.4), respectively (n = 10), with an infant/maternal ratio of 1.8 (1.4–2.6). There was a positive correlation between maternal and infant delivery levels (R = 0.76, p = 0.01). There was an inverse correlation between the number of weeks from final antenatal dose to delivery and infant UST delivery level (R = −0.84, p < 0.01). Six out of ten infants had follow-up UST levels performed. The median time of infant UST clearance was 9 (range 8–19) weeks (n = 5), clearance time being longer if UST was administered in the third trimester (n = 3).

Conclusions: UST levels are stable in pregnancy. The infant/maternal ratio at birth was similar to that seen with anti-tumor necrosis factors, but higher than for vedolizumab. Infants exposed in the third trimester should avoid live vaccination before 6 months of age.
34. Management and outcomes during pregnancy in women with inflammatory bowel disease in a London tertiary hospital

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Abstract
Introduction: Women with inflammatory bowel disease (IBD) have been shown to have poorer outcomes in pregnancy, thus the importance of a multidisciplinary team (MDT) approach with suitable birth plans is vital during pregnancy for optimal outcomes.

Aim: To characterise IBD women attending services for obstetrics care and identify outcomes in pregnancy and areas of improvement for patient management at our institute.

Method: A retrospective analysis was conducted on women with IBD for pregnancy care in our tertiary hospital in 2019 and 2020. Of those booked in 2020, three are still to deliver. Antenatal data collected included: IBD medications, disease activity and number of appointments. Intrapartum data included: mode of delivery, complications during delivery and adverse outcomes.

Results: The total number of women with IBD in our service remained stable across 2019 (n = 24) and 2020 (n = 20). Forty-five percent of women had Crohn’s disease, 45% Ulcerative Colitis and 10% were unclassified. Seventy-three percent of women were on biologic medication during pregnancy. The number of flares reduced from 2019 (n = 8) to 2020 so far (n = 2). The rate of caesarean sections was higher than the NHS average, with a total of 43% (n = 19) performed in women with IBD in 2019 and 2020, of which 42% (n = 8) having had previous surgery for IBD and two requiring the involvement of colorectal surgeons. Five (26%) of the caesarean sections performed were as emergencies. Other complications included three placental abruptions and one third-degree tear with a forceps delivery. The rate of preterm birth was 16%. The number of virtual and face-to-face appointments was also recorded to assess for differences due to the COVID-19 pandemic. There was variation in the number of clinic appointments, and overall an increase in the number of virtual obstetric medicine appointments from 2019 (n = 2%) to 2020 (n = 29%) as well as obstetric appointments (2019, n = 3%; 2020, n = 14%).

Discussion/conclusion: This analysis has shown a high number of women with IBD delivering by caesarean section in pregnancy, including as emergencies. Birth planning during remission and management of IBD symptoms is essential in minimising adverse pregnancy outcomes. An increase in virtual appointments reflects the challenges of continuing to provide optimal care during pregnancy whilst accounting for changing healthcare provision during a pandemic. Constructing the MDT clinic with a clearer pathway and utilisation of virtual appointments is required to better streamline the service.

35. Fetal monitoring in the diabetic pregnancy

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Abstract
Pregnancies complicated by gestational or pregestational diabetes have additional risks for both the women and the fetus. The most important of these risks is stillbirth, and rates of stillbirth are substantially higher in women with prepregnancy diabetes than in the general pregnant population. The aim of fetal monitoring is to predict and prevent stillbirth by timely delivery. The role and limitations of different methods of fetal monitoring will be discussed.

36. Neonatal hypoglycaemia – detecting risk, prevention and management

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Abstract
Neonatal hypoglycaemia is associated with adverse later development, particularly visuo-motor and executive function impairment. As neonatal hypoglycaemia is common and frequently asymptomatic in at-risk babies, these babies are screened for hypoglycaemia in the first 1 to 2 days after birth with frequent blood glucose measurements. Neonatal hypoglycaemia can be prevented and treated with buccal dextrose gel, and it is also common to treat hypoglycaemic babies with formula and intravenous dextrose. However, it is uncertain if screening, prophylaxis or treatment improves long-term outcomes of babies at risk of neonatal hypoglycaemia. This presentation will assess the latest evidence for screening, prophylaxis and treatment of babies at risk to improve long-term neurodevelopmental outcomes.

37. Emerging technology in the care of women with diabetes in pregnancy

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Abstract
Covid 19 has accelerated the use of digital technology for healthcare in Australia and Worldwide. This has created benefits and opportunities for changing the way we provide access, management and care for our patients, including telehealth, remote monitoring of glucose and provision of education. This has also created challenges with technology, patient engagement, resources and confusing nutritional messages in the media and social media. Common themes of over-restriction and overconsumption of food groups and carbohydrates are observed. What lessons have we learnt, and how can we best use technology for both the patient and clinician?

38. Post-pregnancy intervention for the prevention of T2 diabetes

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Abstract
Women with gestational diabetes (GDM) are at high risk for the future development of type 2 diabetes (T2D). The Diabetes Prevention Study has demonstrated that the risk of developing T2D can be reduced amongst women with impaired glucose tolerance who have had GDM, with an intensive lifestyle intervention. However, despite the obvious need, post-pregnancy interventions have not been translated into routine care. Our group has been trialling the use of mobile health technology to develop a post-pregnancy intervention to reduce diabetes risk following GDM. Our system utilises text messaging
and activity monitors to encourage and support a healthy lifestyle post-partum. We have conducted a 60 woman pilot randomized controlled trial (RCT) which has demonstrated feasibility and acceptability of the program. We are currently performing a larger 180 woman RCT. The long-term aim is to implement an affordable system that is effective in reducing diabetes risk, and which can be adopted into routine care.

39. Endocrine causes of hypertension in pregnancy

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Abstract

Hypertension is a common medical disorder in pregnancy that may precede or first appear in pregnancy. Endocrine causes of hypertension are rare in pregnancy. However, it is imperative to have a high index of suspicion because they carry much higher foetal and maternal morbidity and mortality risks. Endocrine disorders presenting as hypertension are primarily the result of autonomous production of renin, aldosterone, cortisol, or catecholamines. Cushing’s syndrome is distinctively rare in pregnancy because fertility is generally reduced due to abnormal gonadotrophin secretion. In pregnancy, adrenal adenoma is the most common cause of Cushing’s syndrome followed by Cushing’s disease. The diagnosis of Cushing’s syndrome during pregnancy may pose a challenge because of overlapping clinical and biochemical features with normal pregnancy. Useful differentiating features may include muscular weakness, purple striae, and osteoporosis—the more catecholubatic features of Cushing’s syndrome and psychiatric disturbance. Normal circadian rhythm of cortisol secretion is a loss in all forms of Cushing’s syndrome therefore midnight plasma cortisol levels and late-night salivary cortisol may be useful; however, the diagnostic thresholds in pregnancy have not been determined. Urinary-free cortisol can only be relied upon if it is more than three times the upper range of normal, particularly in the second and third trimesters. Surgery is more effective, but if no possible medical treatment with metyrapone can be considered. Pheochromocytoma is rare but potentially fatal. Early recognition is important as there are high rates of maternal and foetal complications if undiagnosed. Catecholamine production generally remains stable during pregnancy; only slightly elevated even in pre-eclampsia. First-line investigation includes measurement of plasma or 24 h urinary fractionated metanephrines. Adrenalectomy should only be attempted after optimization of medical therapy with α-adrenergic receptor blockade followed by beta-blockade. Primary hyperaldosteronism is rare despite hypertensive disorders affecting 6% to 8% of all pregnant women and primary hyperaldosteronism being assumed to account for 10% of all hypertensive disorders. It is likely that primary hyperaldosteronism is significantly underestimated in the pregnant population due to the difficult diagnosis. There are no validated reference ranges for aldosterone and renin during gestation, however, a suppressed plasma renin activity and elevated aldosterone are suggestive of the diagnosis. Surgery can be performed in the second trimester if there was a unilateral adenoma, otherwise, defer investigation and definitive treatment until after delivery. Optimal BP control, often achieved medically, is the most important factor in predicting pregnancy outcomes.

40. Heartbreak after preeclampsia

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Abstract

Epidemiological evidence from both national and international cohorts has consistently demonstrated strong associations between preeclampsia and increased ongoing risk of cardiovascular and metabolic disease for affected women. Risks (compared to women after normotensive pregnancy) include at least doubled chance of ischaemic heart disease, cardiovascular death, and stroke, doubled rate of type 2 diabetes even when the preeclamptic pregnancy was not complicated by gestational diabetes, and a five-fold increase in end-stage renal disease. These increases in relative risk are present within 5 to 10 years of an affected pregnancy, continue lifelong, and persist after adjustment for confounding factors. Risks after gestational hypertension appear similar. Adverse cardiometabolic outcomes are further increased in women with preterm preeclampsia, recurrent preeclampsia, and other cardiovascular risk factors such as smoking. Pregnancy complicated by hypertensive disorders, therefore, represents an important opportunity to identify young women at increased risk of cardiovascular disease and implement measures to improve their lifelong health, such as lifestyle behaviour change. However, postpartum follow-up of these women remains largely ad hoc, and few studies have examined early intervention programs. This talk will review the evidence around health risks and how to improve women’s health after hypertensive pregnancy, as well as the evidence gaps to be filled moving forwards.

41. Advanced models for the study of vascular dysfunction in pregnancy: Tales from the laboratory

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Abstract

Preeclampsia (PE) affects 1 in 20 pregnancies and remains a leading cause of maternal and foetal morbidity and mortality worldwide. PE is characterised by hypertension after 20 weeks of gestation with proteinuria, uteroplacental dysfunction and/or maternal organ dysfunction. A characteristic endpoint of PE is widespread maternal vascular dysfunction caused by placental-derived factors and oxidative stress. Novel therapeutics that can target this underlying vascular dysfunction is extremely exciting as future adjuvant therapies. This talk will detail an advanced model for replicating the vascular dysfunction of preeclampsia ‘in a dish’ and using the leading technique of wire myography to assess the potential of therapies to improve vascular dysfunction.

42. Probiotics supplementation increases the risk for preeclampsia

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Abstract
The SPRING trial aimed to prevent gestational diabetes through supplement-
ation with probiotics. This was proven not to be successful with 18.4% (38 of 207) of women in the probiotics arm versus 12.3% (25 of 204) women in the placebo arm (P = 0.10). SPRING was not powered for detecting potential differences in rates of preeclampsia but we reported that 9.2% (19 of 207) women in the probiotics arm and 4.9% (10 of 204) women in the placebo arm developed preeclampsia (P = 0.09). There are no randomized controlled trials (RCTs) of probiotics in the development of preeclampsia. We therefore conducted a meta-analysis of the association between probiotics and pre-
eclampsia in all RCTs of probiotics to prevent gestational diabetes. Of the seven RCTs, four reported on preeclampsia incidence. Each individual study showed a higher incidence of preeclampsia in the probiotics group. Of the 472 women in the probiotics group in the meta-analysis, 31 developed preeclampsia (6.6%) compared with 17 out of 483 women (3.5%) in the placebo group. The risk ratio for preeclampsia in women supplemented with probiotics was 1.85 (95% CI 1.04, 3.29).

Despite evidence for the beneficial effects of Lactobacillus and Bifidobacterium-based probiotics on gut wall barrier function, immune regu-
lation and metabolic regulation, 2 unexpected interactions between the probiotics and the host occur within pregnancy increases the risk for the development of preeclampsia. These results suggest that probiotics may have detrimental outcomes and that their classification as Generally Recognized As Safe (GRAS) should be reconsidered.

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43. Depression and anxiety in women 6 months after hypertensive pregnancy: A blood pressure postpartum (BP2) sub-study
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Abstract
Background/objectives: Hypertensive disorders of pregnancy (HDP) have been associated with postpartum mental health sequelae. However, limited evidence exists on how this risk may differ between subgroups. This sub-study aimed to compare mental health (depression and anxiety) between blood pressure postpartum (BP2) subgroups at baseline (6 months postpartum).

Methods: Sub-study of the in-progress BP2 study, a randomised con-
trolled trial investigating lifestyle interventions after HDP. Data obtained approximately 6 months postpartum from BP2 pre-randomisation questionnaires, including the Edinburgh Postnatal Depression Scale (EPDS) and General Anxiety Disorder 7-item scale (GAD-7). Major sub-
groups compared included: (a) Type of HDP (preeclampsia (PE), gestational hypertension (GH), chronic hypertension (CH) ± superimposed PE + CH), (b) body mass index (BMI; <30, ≥30), (c) primiparous versus multip-
arious and (d) preterm versus term birth.

Results: A total of 212 women (29 CH, 57 GH, 113 PE and 14 PE + CH) randomised to August 2020. In the overall cohort, 2% had a non-zero answer to Q10 (suicidal ideation) on the EPDS, 10% scored above the EPDS cut-off (>12) and 5% scored above the GAD-7 cut-off (>10) at 6-months postpartum. In comparing HDP subtypes, 22% PE + CH scored above the GAD-7 cut-off compared to 7% CH, 5% GH and 3% PE (p = 0.023). A higher proportion of PE + CH (14%) expressed any suicidal ideation on the EPDS compared to 0% CH, 2% GH and 2% PE (p = 0.023). Women with BMI ≥30 (18%) scored above the EPDS cut-off compared to women with BMI <30 (7%, p = 0.01). No significant differences were noted by parity or term versus preterm birth.

Conclusions: Women with previous PE + CH and/or BMI ≥30 appear more at risk of depression and anxiety than other women post-HDP. This has implications for guiding postpartum management, including increased screening and additional psychological follow-up. Further research, including an examination of confounders, is needed to strengthen these conclusions.

44. Association of preeclampsia with myocardial injury among patients undergoing noncardiac surgery: The PREECLAMPSIA-VISION study
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Abstract
Preeclampsia complicates 2% to 8% of all pregnancies and is a major cause of maternal and perinatal morbidity and mortality. There is now a large body of evidence to suggest that preeclampsia is associated with long-term cardiovascular morbidity and mortality.1–3 However, it is unknown whether preeclampsia is associated with increased post-operative cardio-
vascular morbidity and mortality in women. Major operations are esti-
mated to occur at a rate of 4% of the world population per year,4 with a worldwide estimated 234 million major surgical procedures undertaken yearly.5 Given a large number of women worldwide undergoing surgery and the absence of studies investigating preeclampsia as a risk factor for postoperative cardiovascular morbidity and mortality, there was a need
to evaluate the usefulness of preeclampsia in the perioperative assessment of surgical risk factors. We assessed whether a history of preeclampsia is an independent risk factor for myocardial injury after non-cardiac surgery (MINS) and mortality within the first 30 days after surgery. MINS was defined as a prognostically relevant myocardial injury due to ischemia that occurred during or within 30 days after non-cardiac surgery. This study was a sub-study of the VISION study, a large international multicentre cohort study of a representative sample of 40,004 patients recruited between August 2007 and November 2013. Participants were ≥45 years of age and underwent inpatient non-cardiac surgery. For our study, analyses were restricted to the 13,902 participants with a history of pregnancy. Among these women, 976 (7.0%) had a history of preeclampsia. We found that a history of preeclampsia was associated with an increased risk of MINS, with an adjusted hazard ratio of 1.26 (95% CI, 1.03–1.53; p = 0.02), however, preeclampsia was not significantly associated with 30-day mortality. We therefore suggest preeclampsia be considered in the pre-operative cardiovascular risk assessment of women.

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45. Outcomes of patients with pre-pregnancy renal impairment during pregnancy in women with pre-gestational diabetes: A South Western Sydney cohort study

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Abstract
Background: Pregnant women with pre-pregnancy renal impairment are known to have worse obstetric outcomes with an increased risk of accelerated decline in renal function. This cohort study examines the pregnancy and outcomes of women with pre-gestational diabetes mellitus (PGDM) with concurrent pre-gestational renal impairment.

Method: A retrospective audit of data from pregnant women with PGDM from 2 centres in South-Western Sydney from January 2005 to June 2020 was conducted. Data were obtained from a district-wide electronic database and hospital medical records. The outcomes examined were preeclampsia, pre-term delivery (<37 weeks) as well as progression to dialysis during and after pregnancy. Women with renal impairment were defined as having a first-trimester serum creatinine of >80 µmol/l whilst well.

Results: In this cohort of 494 women with pre-gestational diabetes, 11(2.5%) women were noted to have serum creatinine of > 80 µmol/l in their first antenatal review (first or second trimester). There were no statistically significant differences in the age, body mass index (BMI), pre-gestational HbA1c, and prophylactic aspirin or calcium use between women with and without pre-gestational renal impairment. However, women with renal impairment had a higher rate of previous preeclampsia (32 (7.5%) vs. 3 (27.3%), p ≤ 0.05) compared to women with no renal impairment. There was a significantly higher rate of preeclampsia (36% vs. 12%, p < 0.05), and preterm delivery (60% vs. 24.8%, p < 0.05) in women with pre-gestational renal impairment. Of the 11 women, 1 woman required dialysis during pregnancy and subsequently died 1 month later.

Conclusion: Women with pregestational renal impairment were observed to have worse obstetric outcomes. A larger prospective study with significant follow-up would be beneficial in determining the incidence of progression of renal disease in these women in the post-partum period.

46. Drugs to prevent, or treat preeclampsia: Revisiting the old, discovering the new

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Abstract
There is currently just one drug – aspirin – that clearly prevents preeclampsia (relative risk reduction for all preeclampsia of 18%). And no disease modifying drugs available to treat preeclampsia. My research has a strong focus on identifying and evaluating treatments for preeclampsia. There appears to be a trend for increasingly liberal administration of aspirin to prevent preeclampsia and other placental disorders. There has even been commentary proposing it is universally administered to all pregnancies. The likely reason that aspirin is so freely recommended is because the drug is considered really safe. Collaborating with Swedish colleagues, our team has been revisiting the safety and efficacy of aspirin in large population epidemiological studies. In the first part of the Priscilla Kincaid Smith Lecture, I will discuss our research revisiting the safety and efficacy of aspirin. In the second part of this lecture, I will present our program of research to discover drugs that clearly prevent pre-eclampsia. In the second part of this lecture, I will present our program of research to discover drugs that clearly prevent pre-eclampsia.
47. OGTT – Process and preanalytical issues?

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Abstract
Pre-analytical processing of blood samples can affect plasma glucose measurement, as ongoing glycolysis by cells prior to centrifugation can lower its concentration. This has important implications for gestational diabetes mellitus (GDM) diagnosis. For example, after ACT Pathology changed their oral glucose tolerance test (OGTT) preanalytical protocol from delayed centrifugation (after collection of the 120 min sample) to early centrifugation (within 10 min of blood collection) of blood samples collected in sodium fluoride tubes, the GDM diagnosis rate increased from 11.6% (869 of 7509 tests) to 20.6% (1007 of 4887 tests).¹ In this presentation, the pros and cons of various preanalytical processing options (e.g. type of collection tube, use of ice slurry for early cooling, and time to centrifugation) will be discussed. New data on the outcomes of pregnancies with borderline GDM, missed and not treated due to delayed sample centrifugation, compared to those with mild GDM, diagnosed and treated due to early sample centrifugation, will be presented. The need to harmonise the pre-analytical blood processing protocols for pregnancy OGTTs, whilst solving the logistical issues of performing OGTTs in different settings (e.g. rural and remote), will be discussed.

Reference
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49. Current management, recommendations and uncertainties in the detection and management of fetomaternal haemorrhage

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Abstract
Detection and subsequent management of fetomaternal haemorrhage (FMH) has had a significant reduction in anti-D sensitisation with improved neonatal outcomes. Detecting FMH and estimating the volume of bleed is important in determining the appropriate dose of RhD immunoglobulin (RhD Ig) for RhD negative women following a sensitising event. FMH testing may also be used when assessing fetal welfare. The author will discuss the current issues in FMH detection, referring to the recently updated Australian and New Zealand Society of Blood Transfusion Guidelines for laboratory estimation of FMH; and the current recommendations in management of RhD negative women, with reference to the 2021 National Blood Authority’s Prophylactic use of RhD immunoglobulin in pregnancy care.

51. Systematic review of the effectiveness of hydroxychloroquine and intravenous immunoglobulin to prevent cardiac neonatal lupus in offspring of women with autoantibodies to SSA/Ro & SSB/La.

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Abstract
Introduction: Offspring of women with autoantibodies to anti-Sjogren’s syndrome A (anti-SSA)/Ro and/or anti-Sjogren’s syndrome B (anti-SSB)/La have a 1% to 2% chance of developing cardiac neonatal lupus (CNL) which may lead to congenital heart block, endocardial fibroelastosis or foetal demise.¹ Hydroxychloroquine (HCQ) and intravenous immunoglobulin (IVIG) have been used during pregnancy to prevent CNL in the offspring of women with anti-SSA/Ro and anti-SSB/La autoantibodies. We performed a systematic review of studies ascertaining the effectiveness of HCQ and IVIG taken during pregnancy in preventing CNL.

Methods and analysis: Population: Offspring of women with anti-SSA/Ro and SSB/La antibodies >12 weeks’ gestation.

Interventions: Maternal exposure to HCQ or IVIG during pregnancy.

Comparison: Standard of care.

Outcome: CNL. Two authors (KL & LW) searched PubMed, Ovid Embase and Medline from database inception – December 2020. One author (KL) searched CINAHL, Clinical Trials.gov, Cochrane databases from database inception (December 2020) and hand-searched relevant reference lists. The search strategy combined free text search terms, exploded MeSH/EMTREE terms, and all synonyms of the medical MeSH major topic terms. Women with rheumatic conditions without anti-SSA/Ro and SSB/La antibodies and pregnancy losses <12 weeks’ gestation were excluded. Case reports and series were excluded. If consensus for inclusion was not reached between 2 authors (KL and LW) a third author (ML) was consulted.

Results: Two authors (KL and LW) screened 275 studies and performed full text review for 93 studies. Sixteen studied met criteria for data extraction. This systematic review suggests a benefit of HCQ during pregnancy in preventing CNL and little to no benefit of IVIG. Risk of bias assessment with the ROBINS-I tool² revealed most included studies had a serious risk of bias, therefore a meta-analysis was not performed. CNL was a rare event, even in this cohort of patients, and this limited the use of odds and risk ratios.

48. Bleeding disorders in pregnancy

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Abstract
Pregnancy and childbirth pose unique haemostatic challenges. The associated risks and severity of potential bleeding complications are increased in women with inherited bleeding disorders. Local guidelines and practice will be discussed demonstrating that these women can deliver safely and receive neuraxial analgesia without complication when best practices are adhered to. Postpartum haemorrhage appears to occur at higher rates than the general population despite adequate factor levels or planned replacement. Whilst an obstetric cause was demonstrated in many are current definitions of ‘adequate’ factor levels at the time of birth appropriate?
52. Single centre, retrospective review of compliance with routine antenatal Rhesus D prophylaxis

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Abstract

Background: Fetomaternal haemorrhage is the loss of fetal blood cells into the maternal circulation and can cause haemolytic disease of the newborn. Antenatal prophylaxis with Rh(D) immunoglobulin is recommended to minimise Rh(D) alloimmunisation.

Aim: To review compliance with the National Blood Authority and Australian and New Zealand Society of Blood Transfusion guidelines pertaining to the prophylactic use of Rh(D) immunoglobulin and investigation of fetomaternal haemorrhage in obstetric patients.

Materials and methods: A single centre, retrospective cohort study for all Rh(D) negative pregnant women was performed. Maternal demographics, date of delivery, data pertaining to the administration of Rh(D) immunoglobulin and fetomaternal haemorrhage volume were collated and audited against National guidelines. Local research ethics permission was obtained.

Results: A total of 323 Rh(D) negative women with a mean age of 31 years (SD 5.2 years) and a median gestation at delivery of 39 weeks (IQR 2.6) were identified. In total, 57.6% (n = 186) of women had at least one Rh(D) positive infant. Of the 222 women with a complete Rh(D) immunoglobulin administration record, 54.9% (n = 122) exceeded the recommended dosage interval of 42 days. No women with a Rh(D) negative infant received Rh(D) immunoglobulin post-delivery. Three women (1.6%) with Rh(D) positive infants did not receive Rh(D) immunoglobulin post-delivery.

Conclusion: A number of women did not receive prophylactic Rh(D) immunoglobulin at the correct time, with a significant number exceeding a dosage interval of 42 days. This could be associated with Rh(D) alloimmunisation and increased risk of haemolytic disease of the newborn in subsequent pregnancies.

61. Obesity, pregnancy and lifestyle clinic: Evaluation and outcomes

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Abstract

Background: Increasing numbers of women are entering pregnancy with an elevated body mass index (BMI). Elevated maternal BMI is associated with a number of adverse obstetric and neonatal outcomes, however, attention to diet and lifestyle during the antenatal period has been shown to reduce the rate of many of these complications. The Obesity, Pregnancy and Lifestyle (OPAL) clinic was started at the Northern Hospital in July 2018 to provide specialised antenatal care to women with Class III obesity (BMI ≥ 40 kg/m2).

Methods: We performed a retrospective cohort study of women with a BMI ≥ 40 kg/m2 delivering a singleton pregnancy at the Northern Hospital, Melbourne, Victoria, between January 2019 and April 2020, comparing obstetric and neonatal outcomes of women who attended the OPAL clinic (n = 60) to those who received standard antenatal care (n = 121). Statistical analysis performed using χ², Fisher’s exact test, student’s t-test and Mann–Whitney (rank sum) test with a significance level of 0.05.

Results: Compared to similar women in standard antenatal care, women who attended the OPAL clinic are more likely to be younger (mean age 29 vs. 32 years, p = 0.001), to be primiparous (OR 2.65 (1.33–5.28), p = 0.005) and to be born in Australia or New Zealand (OR 0.47 (0.22–1.03), p = 0.057). OPAL women also attended a significantly higher number of antenatal appointments (9 vs. 8, p = 0.017) and had a lower median gestational age of delivery (38.3 vs. 38.5, p = 0.024).

Conclusions: These results suggest that the OPAL clinic has achieved increased engagement of women with class III obesity in antenatal care. However, significant demographic differences indicate there is a subset of women still not receiving specialist care despite best intentions, indicating clinic processes are in need of review. Future research should focus on the patient experience of women attending the OPAL clinic.
on-line information sessions may help women who have GDM feel more supported to breastfeed their newborns.

**Conclusions:** Women with GDM feel overwhelmed and confused by fragmented education and information about their care which can impact on their breastfeeding rates on discharge from hospital. Accessing evidence-based information through technology may encourage informed conversations between a woman and their health care providers for individualised care which in turn may improve breastfeeding rates thereby limiting their risk for developing T2DM in the future.

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**64. Incorporation of diabetic retinopathy screening into an antenatal clinic**

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**Abstract**

**Background:** Early recognition of diabetic retinopathy (DR) is essential to avoid irreversible vision loss. Pregnancy is an independent risk factor for progression of DR, however, pregnant women with pre-gestational diabetes often fail to meet the recommended screening targets. Known barriers to screening in pregnancy include the logistical difficulties of attending multiple medical appointments and ease of access to screening facilities. Non-mydriatic retinal photography is an accepted modality for DR screening. It does not require significant training for the operator, avoids pupil dilation and creates a permanent record of retinal appearances.

**Objective:** To describe our experience of the introduction of a retinal camera to the multidisciplinary diabetes clinic at a tertiary maternity hospital and to compare maternal retinal screening rates before and after the camera’s introduction.

**Methods:** A retinal camera was installed at King Edward Memorial Hospital (KEMH) in 2020. Patient characteristics, diabetic retinopathy (DR) screening and retinopathy diagnosis rates before and after camera installation were recorded for all pregnant women with pre-gestational type 1 or type 2 diabetes who received pregnancy care at KEMH from March 2020 to January 2021.

**Results:** A total of 174 women were included in the study. The only significant difference in baseline patient characteristics between the two groups was in glycosylated haemoglobin in the third trimester. There were significantly more women who received at least one retinal screen for DR following the installation of the retinal camera (93.0% vs. 54.3%; p < 0.001). The identification of DR and DR progression also increased significantly in the post-retinal camera group.

**Conclusion:** The introduction of an onsite retinal camera to a diabetes in pregnancy clinic significantly increased the number of women receiving appropriate retinal screening, the identification of DR and of DR progression. The use of a retinal camera in similar antenatal clinics is a feasible option to improve outcomes.

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**65. Longer gestation in women who consume a low carbohydrate diet in pregnancy**

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**Abstract**

**Background:** Obstetric outcomes in women consuming low carbohydrate diets have reported conflicting results. The majority of these studies have defined low carbohydrate intake by the proportion that carbohydrates contribute to overall caloric intake. We hypothesised that a low absolute carbohydrate intake affects obstetric outcomes differently than a low relative carbohydrate intake.

**Methods:** Detailed dietary data was collected in women enrolled in the Study of Probiotic IN Gestational diabetes (SPRING) at both 16 and 28 weeks’ gestation by food frequency questionnaire. Obstetric outcomes were compared between women consuming a low carbohydrate diet (LCD) defined as carbohydrate content of <100 g per day and women consuming a standard diet (SD) defined as >100 g of carbohydrate per day independent of overall energy intake.

**Results:** Mean gestation was increased in women consuming a LCD at 16 and/or 28 weeks’ gestation, compared with women consuming a SD. The difference was greatest when women consumed a LCD at both 16 and 28 weeks’ gestation (16: 39.7 vs. 39.2 weeks, p = 0.02; 28: 39.9 vs. 39.2 weeks, p = 0.02; 16 and 28: 40.1 vs. 39.2, p = 0.0025). Gestation was not increased in women consuming a diet where carbohydrate contributed to <40% of overall energy intake. Birth centile was decreased in off-spring of women consuming a LCD at 28 weeks’ gestation, but not in women consuming a LCD at 16 or both 16 and 28 weeks’ gestation. No other statistically significant differences in obstetric outcomes were observed.

**Conclusion:** Consumption of <100 g of carbohydrate per day in pregnancy is associated with increased gestational age at delivery.

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**66. Eclamptic seizure and maternal alpha-1 antitrypsin deficiency: A diagnostic dilemma**

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**Abstract**

A 35-year-old primiparous woman presented at 39 weeks with first seizure on a background of alpha-1 antitrypsin deficiency (A1AD), which is associated with chronic lung and liver disease. She presented with
generalised tonic seizure and intermittent word-finding difficulty. She was globally hyper-reflexic with no clonus and no other abnormal neurological findings. Urate was elevated at 0.45 but serum pathology was otherwise unremarkable. Cardiotocography (CTG) and computed tomography (CT) brain were normal. She was treated with midazolam and magnesium sulphate for undifferentiated seizures and underwent an emergency caesarean section with breech delivery of a well neonate. Postpartum, she was seizure-free. Magnetic resonance imaging (MRI) angiogram with gadolinium was normal and she was commenced on levetiracetam for seizure prophylaxis. A1AD is characterised by reduced alpha 1 antitrypsin (AAT) level in plasma which can result in pulmonary emphysema and in pregnancy cause exacerbation of airways disease. More recently, however, A1AD has been associated with preeclampsia. Preeclamptic pregnancies have been associated with up to 50% lower levels of AAT when compared to normal pregnancies. In addition, AAT injection has been studied in mice with preeclampsia resulting in improved blood pressures and urine protein levels.12 This case poses a diagnostic dilemma due to unclear cause of seizure with possible causes including eclampsia and stroke. Although it is an atypical presentation of preeclampsia given intermittent expressive aphasia, preeclampsia was possible given onset in pregnancy, elevated urate and improvement following magnesium sulphate treatment. Conversely, it is possible that improvement was in response to levetiracetam or simply coincidental. Seizures in pregnancy can be difficult to differentiate, however, require prompt management. Eclampsia should be considered in every seizure in pregnancy, even with atypical presentation. Further, there may be a relationship between preeclampsia and A1AD, however, further studies are required to establish causative relationship.

67. Hairy cell leukaemia in pregnancy: Two cases and a review of the literature
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Abstract
Hairy cell leukaemia (HCL) is a rare haematological malignancy characterised by abnormal B cell lymphocytes causing pancytopenia and splenomegaly. It is uncommon in the general population, accounting for 1% to 2% of all leukaemia. It is particularly rare in young females, therefore, there are limited cases reported in the literature of HCL affecting pregnancy. This review will discuss two cases seen at a tertiary maternity hospital over the past four years. We will detail their presentation eventuating to diagnosis, the investigations carried out and the management during the antenatal, intrapartum and postpartum periods. Although rare, it is important to review these cases and the management initiated in order to optimise outcomes for future pregnancies affected by this disease. First and second line treatment for HCL are medications that would usually be avoided in pregnancy: purine analogues and biological therapies. These are classified by the Australian Therapeutic Goods Administration as category D and C drugs, respectively. Given these classifications, it is optimal to delay their use in pregnancy until after delivery has been achieved. A review of the literature revealed 12 articles relating to HCL in pregnancy. All detailed treatment with purine analogues, interferons and/or splenectomy. This case review is important as it avoided the use of potential teratogens during the antenatal period. Successful supportive therapy (e.g. blood transfusions and prophylactic antibiotics) was instead initiated, and achieved term delivery in both cases. Patient A had a diagnosis of relapsing HCL at the time of pregnancy, and Patient B was first diagnosed during the second trimester. Although both patients had low total white cell counts (normal neutrophil counts) antenatally, only Patient B was initiated on oral prophylactic antibiotics. Both patients delivered at term: Patient A had an elective caesarean section and Patient B had a vaginal birth. The patients received differing antibiotic regimes at delivery: patient A received cefazolin and metronidazole compared to Patient B who received piperacillin/tazobactam. The rationale for this management is unclear; both patients remained afebrile, no risk factors for peripartum infection were identified and their white cell counts remained stable. There does not appear to be a standardised protocol to guide antibiotic therapy in patients who are at risk of developing neutropenia in the antenatal, intrapartum or postpartum period. This is an area that requires further research in order to standardise antibiotic therapy. This would allow optimisation of patient care and ultimately improve maternal and fetal outcomes.

68. Gestational diabetes mellitus (GDM) care re-imagined – 2: Education and clinical review delivery to support a radical model of care change
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Abstract
Introduction: We present the key steps from the implementation of a multifaceted digital solution in our busy and under-resourced gestational diabetes mellitus (GDM) service.

Method: Collaborative design led by Obstetric Medicine, including Dietetics, Diabetes Education, Midwifery and Obstetrics, and consultation with Administrative Services, Interpreting Services, and Pharmacy progressed this service redesign project. Steps taken included: (1) mapping of women’s journey through the standard GDM model of care, (2) identification of barriers to service access, occasions of variations in care delivered, duplication of processes, and inefficient use of time and/or resources and (3) review of profession-specific appointment scheduling guidelines.

Innovations and process changes aimed to overcome identified barriers and included a co-creation process with women from four common interpreted languages. Appointment attendances, video views, adherence and clinical outcomes have been monitored to assess model of care adoption and acceptance.

Results: The new model of care was introduced in stages between June and November 2020. It involved:

1. Changes to results acknowledgement of an abnormal glucose tolerance test (timing, process, and staff responsibility).
2. Initial ‘education’ contact (via email and delivery of URLs to two instructional videos).
3. Courier of glucometer to women with NDSS registration.
4. Smartphone app to enable asynchronous blood glucose level (BGL) sharing, monitoring, and clinician feedback.
5. Standardised ‘introduction to GDM’ video in six languages, with culturally-appropriate dietary advice.
6. Joint dietitian and diabetes educator appointments for first two face-to-face clinic visits at day 7 and 14 post diagnosis.
7. Removal of ‘GDM schedule’ with increased access to urgent dietitian and insulin commencement appointments.

GDM clinic attendance rate has increased from 60% to 95%. Average views of the videos have been 120/month (but one group has been viewed 250/month) since release.

Conclusion: A multifaceted digital solution integrated into a radical model of care change demonstrates positive initial feedback and process outcomes. The authors have presented 3 inter linked abstracts for review:

1. Gestational diabetes mellitus (GDM) care re-imagined – 1: Integration of a digital solution into a radical model of care change.
2. Gestational diabetes mellitus (GDM) care re-imagined – 2: Education and clinical review delivery to support a radical model of care change.
3. Insulin wastage in GDM – Is sustainability a pipe dream?

69. Pituitary haemorrhage following dural puncture
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Abstract
Introduction: Intracranial haemorrhage, predominantly subdural haematoma, is an uncommon complication of dural puncture. Pituitary haemorrhage (pituitary apoplexy) is rare.

Case presentation: A 23-year-old G5P4 Australian Indigenous woman presented in spontaneous labour at uncertain gestation having had no antenatal care. Three attempts at epidural anaesthesia were unsuccessful, and the woman proceeded to vaginal delivery of a 3574 g male with estimated blood loss during delivery of 150 ml, the lowest recorded maternal blood pressure of 110/68 mmHg. Seven hours post-delivery the woman complained of a postural headache typical for post-dural puncture headache (PDPH). Transient relief was obtained following epidural blood patch, however, headache recurred with increasing intensity. Magnetic resonance imaging disclosed pituitary haemorrhage with bulging into the suprasellar cistern and elevation of the optic chiasm without an underlying pituitary adenoma, with pachymeningeal thickening, distension of the intracranial and intercavernous venous sinuses and drooping of the brainstem consistent with intracranial hypotension. Serum cortisol and computer visual fields were normal.

Discussion: Twenty-one (81%) of the 26 reported cases of post-partum acute pituitary haemorrhage were associated with significant maternal blood loss or anaemia. Of the remaining five reports, one was associated with severe hypotension at the time of epidural anaesthesia, and another with a PDPH with an underlying pituitary macroadenoma. No obvious precipitant for pituitary haemorrhage occurred in three cases other than PDPH. The pituitary is more vulnerable to injury during pregnancy as a result of the 20% to 36% increase in volume, which reaches its maximum in the first 3 postpartum days. The importance lies in the potential for life threatening hypothalamic–pituitary–adrenal axis insufficiency, visual compromise, and cranial nerve injury. The possibility of pituitary haemorrhage should be considered in any woman with PDPH, which is severe and unrelied by epidural blood patch, or where agalactia, hypotension or visual symptoms are present.

70. Clinical characteristics and sequelae of intrapartum hypertension – A retrospective review
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Abstract
Background: In a significant proportion of women, elevated blood pressure (BP) may first present during delivery. Intrapartum hypertension (IH) is often overlooked as BP during delivery may be affected by pain, analgesic agents and haemodynamic changes. This study sought to define the prevalence of IH in previously normotensive women, identify associated clinical characteristics, and its impact on maternofetal outcomes.

Methods: In this single-centre retrospective cohort study, all available partograms were reviewed over a 1 month period at Campbelltown Hospital. Women with pre-existing hypertensive disorders of pregnancy (HDP) were excluded. IH was defined as systolic BP (SBP) ≥140 mmHg or diastolic BP (DBP) ≥90 mmHg during delivery. Baseline characteristics, intrapartum factors, and maternofetal outcomes were collected.

Results: Of 300 partograms, 18 women with pre-existing HDP and 53 partograms without BP measurements were excluded. Amongst 229 deliveries, 91 (39.7%) had IH. Eighty-two women (35.8%) had SBP ≥140 mmHg, 12 (5.2%) had SBP ≥160 mmHg, and 44 (19.2%) had DBP ≥90 mmHg. A higher body mass index (BMI; p = 0.02) and higher booking SBP (p = 0.04) were associated with IH. Women who had any labour onset were less likely to have IH (p < 0.01). A longer second stage of labour (p = 0.03), intrapartum non-steroidal anti-inflammatory medications (p < 0.01) and epidural anaesthesia (p < 0.01) were associated with IH, while IV syntocin for labour induction was not. Women with IH had a longer inpatient admission following delivery (p = 0.01), and elevated postpartum BP (p < 0.01) with discharge on regular antihypertensive medications (p = 0.01). IH was also associated with Apgar scores <9 at 1 and 5 min (p = 0.03; p = 0.02), neonatal birthweight <10th percentile (p = 0.01), and need for high-level neonatal care (p = 0.02).

Conclusion: Almost 40% of previously normotensive women developed IH, which was associated with longer maternal admission, elevated postpartum BP and discharge with regular antihypertensive medications. Foetal outcomes were also poorer, with lower Apgar scores, more neonatal birthweight <10th percentile and an increased need for high-level neonatal care.

71. Imaging of headaches in pregnancy and the puerperium
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Abstract
Background: Headache disorders are common and typically affect women of childbearing age.1 Most can be attributed to primary headaches, such as tension headaches or migraines.2 However, pregnancy can exacerbate pre-
existing neurological conditions and increases the risk of pathological vascular processes such as pre-eclampsia, cerebral venous thrombosis and many other diagnoses. Symptoms can be non-specific and it can be challenging to diagnose on clinical grounds alone. Increasingly, computed tomography (CT) and magnetic resonance imaging (MRI) modalities are utilised to help with management and prediction of severe outcomes. There are no universally accepted guidelines to determine need for imaging in headaches during pregnancy and the puerperium.

**Objectives:** To determine the incidence of headaches in pregnancy and puerperium at Campbelltown Hospital over a 12-month period. To determine clinical predictors for detecting abnormalities on CT or MRI.

**Methods:** A retrospective clinical audit of pregnant and postpartum patients admitted to Campbelltown hospital with headache from 1 January 2020 to 31 December 2020 was conducted. Campbelltown Hospital's medical record was searched for Diagnosis Related Group (DRG) codes for pregnancy or postpartum and headaches/pre-eclampsia/hypertensive disorder of pregnancy/intracranial lesion. Demographic data, red flag data, investigations and diagnoses were collected by a thorough chart review.

**Results:** There were 115 patients with headaches and 3,906 consecutive patients admitted to Campbelltown hospital with headache from 1 January 2020 to 31 December 2020. The incidence was 2.94%. Median age was 30 years (range 16–45). Nine patients identified as aboriginal (8.49%). Sixty percent of patients had hypertensive disorders. Majority of patients were in their third trimester (66%) or postpartum (22%). Forty-two patients had imaging, 33 patients had CTs performed. 15 had MRIs performed. None of the patients with hypertensive disorders had imaging. Everyone who had an MRI was seen by neurology. Most imaging was normal or non-specific, except for pontine stroke, posterior reversible leukoencephalopathy and compression of the trigeminal nerve. Hypertensive disorders were the most common cause of headache, followed by migraine. Treatment consisted of antihypertensives, simple analgesics or anti-emetics. Seventeen percent of patients with a hypertensive disorder had MgSO4 infusions.

**Conclusions:** Hypertensive disorders were the most common cause for headaches admitted to hospital in pregnancy. Headaches typically occurred in the third trimester or postpartum. Imaging was performed in those with no known hypertensive disorder. There was minimal yield from imaging. The data was limited by its retrospective nature, missing data and poor documentation. A future direction would be to develop a risk stratification tool to better allocate imaging resources.

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72. The Ferinject referral form: Does a structured request form improve compliance with hospital guidelines for iron infusions?

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**Abstract**

Iron deficiency is one of the most common problems encountered in antenatal care, with approximately 18% of pregnancies experiencing iron deficiency without anaemia, and 38% experiencing iron deficiency anaemia. Iron is known to be critical for both maternal, foetal and neonatal morbidity and mortality, with foetal/ neonatal iron deficiency influencing long-term neurological outcomes. The two treatment modalities for iron deficiency are oral and parenteral, both of which have a role in the management of iron deficiency in pregnancy. Oral therapy is the mainstay of treatment. Parenteral iron reserved for patients who do not respond to oral therapy, or are inappropriate for oral therapy. This study aims to determine the efficacy of a structured request form to increase compliance with hospital iron therapy guidelines, and decrease inappropriate iron infusions. A two-month period of iron infusions was audited against the hospital iron therapy guidelines to determine baseline compliance. Only 35% of iron infusions met the hospital guidelines. Prior to iron infusion only 44% of patients received an adequate trial of oral iron. Of those patients commenced on oral iron, only 53% had been compliant. The ferinject referral form led to a 27% increase in compliance with hospital guidelines (p = 0.053) and a reduction in total number of iron infusions by 52%, as well as a reduction in infusions for iron deficiency compared to iron deficiency anaemia p = 0.014.

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73. Maple syrup urine disease in pregnancy: A case review of a grand multiparous couple who are carriers for the disease

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**Abstract**

**Introduction:** Maple syrup urine disease (MSUD) is an autosomal recessive amino acid disorder, affecting approximately 1 in 220,000 live births. MSUD is caused by aberrancy of the branched-chain alpha-ketoacid dehydrogenase complex enzyme, thus disabling branched chain amino acid (BRAA) metabolism. Toxic accumulation of BRAA, especially leucine, may cause a metabolic crisis, including weight loss, lethargy, seizures and death, especially in early infancy. The risk of a metabolic crisis persists throughout the affected individual’s life and can be exacerbated by physiological stress. We present a case of a grand-multiparous woman and her partner who are carriers for MSUD.

**Case presentation:** A 33-year-old woman and her consanguineous partner are carriers for MSUD. Her second and third child died at 20 days of life due to MSUD whilst living in Libya. In Australia, her fourth pregnancy was terminated due to MSUD-affected foetus. Her fifth child was diagnosed with MSUD at birth as she did not have genetic testing in early pregnancy. The infant required intensive care at birth but is alive and well. Our
care for her sixth pregnancy included chorionic villus sampling at 13 weeks demonstrating a heterozygous genotype. Post-partum, the infant underwent paediatric review at delivery and at 6 weeks and remains well.

**Discussion:** Due to advances in management of inherited metabolic conditions, more women affected by or carriers of previously fatal diseases are able to thrive and build families of their own. Women with MSUD present a challenge to pregnancy care providers as the physiological state of pregnancy can have a significant impact on the affected woman and the gestate. Pregnancy is an anabolic state, thus women require careful titration of protein intake and monitoring of their plasma leucine levels by multidisciplinary teams. Delivery should be planned prudently, as the catabolic stress of labour can trigger a crisis, as can surgical intervention, especially if they are to remain nil by mouth. Furthermore, protein turnover during breastfeeding require caloric and protein optimization for these women. Pre-conception counselling for all women and/or partners who have MSUD or are carriers for the gene is ideal. Pre-implantation or early pregnancy genetic testing should be offered with counselling targeted at patient's values and needs.

**Conclusion:** MSUD is a rare metabolic, inherited disease. Women who are affected or carriers require close surveillance and multidisciplinary input. Prenatal and early pregnancy counselling should be individualized and targeted by the patient's needs and available resources.

### 74. Masquerades in the delayed presentation of HELLP Syndrome

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**Abstract**

**Introduction:** Preeclampsia is diagnosed by raised blood pressure occurring after 20 weeks' gestation, and involvement of one or more organ systems, including renal, haematological, hepatic and neurological; also, the developing fetus. Preeclampsia in Australia, affects ~3% of pregnancies. It increases maternal and perinatal mortality and morbidity, with haemolytic-uramic syndrome (secondary or atypical), acute fatty liver of pregnancy, systemic lupus erythematosus and antiphospholipid syndrome. Therefore, an accurate diagnosis is important, for prompt management while avoiding delays.

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### 75. Shear wave placental elastography in women with pre-existing diabetes and other ‘high-risk’ pregnancies

**Akhil Gupta**

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**Abstract**

**Background:** Women with type 1 and type 2 diabetes are at high risk of pregnancy complications including gestational hypertension, pre-eclampsia and intra-uterine growth restriction (IUGR) with the placenta mediating many of these outcomes. Structural changes in the placenta have been assessed with ex vivo tissue sampling, histopathological examination and immunohistochemistry. More recently, in vivo assessment of placental change has been studied using ultrasound-based shear wave elastography (a routine diagnostic tool to estimate fibrosis in chronic liver disease). We aimed to investigate the role of placental elastography in women at very ‘high risk’ – those with type 1 or type 2 diabetes prior to conception.

**Methods:** We conducted two distinct literature searches to broadly capture all relevant published data. Our first search was to summarize the known histopathologic changes in placentas of women with type 1 or type 2 diabetes. Our search terms included ‘Diabetes mellitus’ AND ‘placenta’ AND ‘histopathology’. Our second search used the terms, ‘elastography’ OR stiffness OR Elasticity OR kPa OR kilopascals AND placenta’ to capture and summarize structural placental changes detectable by elastography. To estimate the increasing stiffness with ‘high risk’ pregnancies, we conducted a meta-analysis of 16 relevant studies that reported stiffness in metres per second (m/s) OR kilopascals (kPa).

**Results:** After screening, we identified 57 studies for full text review of histopathology in women with type 1 or type 2 diabetes published between 1969 and 2017. There is a wide variety of histopathologic changes described in women with diabetes, however, none are considered pathognomonic, and indeed some may be shared common processes with other conditions such as hypertension or IUGR. Broadly, histopathological changes are divided into categories based on presumed aetiology including maternal malperfusion, fetal malperfusion, infectious/inflammatory. After screening, we identified 16
relevant studies (with reports of stiffness values) to be included in meta-analysis. In vivo placental elastography may detect a difference in stiffness scores for many women with a ‘high-risk’ pregnancy. The mean difference for maternal-derived pathologies was 4.5 kPa (95% CI 3.16–5.87) and for fetal-derived pathologies 6.5 kPa (95% CI 1.08–11.86). Very few of these studies included women with pre-existing diabetes (we identified <10 participants with pre-existing type 1 and/or type 2 diabetes across the 16 studies).

Conclusion: Placental stiffness measurements may provide an in vivo approximation of placental histopathology in women with diabetes. Placental elastography might be useful in studying whether diabetes, pre-eclampsia and IUGR share common pathways to structural placental changes.

76. Attitudes toward antibiotic use in pregnancy and after birth – A survey of Australian women

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Abstract

Background: Peripartum antibiotics are commonly prescribed. This survey aimed to evaluate the attitudes of Australian women toward antibiotic use during the peripartum period and determine if they were aware they had received antibiotics.

Methods: Women who delivered by any mode at the Royal Brisbane and Women’s Hospital provided consent and completed a post-partum survey. Survey responses were recorded on 5-point Likert scales. Participant characteristics, delivery details and antibiotics administered 48 h either side of delivery were obtained from the medical record.

Results: Between December 2020 and March 2021, the survey was offered to 298 women and completed by 248 (response rate 83%). The mean (SD) age was 30.9 (4.9) years and the median (IQR) gestation offered to 298 women and completed by 248 (response rate 83%). Between December 2020 and March 2021, the survey was.

Conclusion: Women in the peripartum period were generally not aware of receiving peripartum antibiotics, despite most having concerns about unwanted side effects. Clinicians should communicate the indication and potential side effects of antibiotics at the time of administration to allow shared decision-making and optimise patient-centred care.

77. T2DM is associated with impaired lactogenesis (secretory activation) manifested by a delayed citrate concentration rise in early breastmilk and reduced exclusive breastfeeding at four months postpartum

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Abstract

The rate of successful breastfeeding (BF) establishment beyond hospital discharge in women with type 2 diabetes mellitus (T2DM) is poorly described, although small studies suggest it is reduced compared to both women with gestational diabetes mellitus (GDM) and women without diabetes. One postulated reason is delayed secretory activation (SA), which is the onset of copious milk production, or milk ‘coming in’, that normally occurs between 24 and 72 h postpartum. SA can be measured by examining changes in milk constituents that occur at the time copious milk secretion begins, including citrate and lactose whose concentrations rapidly increase. We examined the change in breastmilk citrate concentration in women with T2DM, control women matched for age, body mass index (BMI) and parity, and control women matched for age and parity but with normal BMI (18.5–25). Women with T2DM had a delay in SA, compared to both BMI matched and normal BMI controls. This was manifest by a slower rise in citrate and a lower mean plateau value, both results suggesting early breastmilk volume may be lower in women with T2DM. Higher insulin dose per kg in women with T2DM was associated with increased time to predetermined citrate values and provides further evidence for the role of insulin resistance in impaired milk production. Exclusive BF at four months postpartum was lower in both women with T2DM and BMI-matched controls; however, it remains unclear to what extent delayed SA (and potential supplemental feeding) influence successful establishment of breastfeeding in women with T2DM and/or higher BMI.

78. A rare case of postpartum central diabetes insipidus

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Abstract

Introduction: We present a rare case of postpartum central diabetes insipidus (DI) in a previously well 35-year-old woman.

Case presentation: The pregnancy was uneventful until 40 weeks of gestation when she was admitted with prelabour rupture of foetal membranes. The delivery via caesarean section was complicated by intraoperative hypotension and severe postpartum haemorrhage. She developed
polyuria on day 1 postpartum and central DI was confirmed biochemically on day 2 postpartum. There was no evidence of anterior pituitary hormone insufficiency, and she was able to lactate normally postpartum. Magnetic resonance imaging (MRI) of the pituitary did not demonstrate any features to suggest Sheehan’s syndrome, pituitary apoplexy with underlying adenoma, or hypophysitis. The posterior pituitary bright spot could not be identified on T1-weighted images, which is suggestive of impaired arginine vasopressin (AVP) secretory capacity. The copeptin levels were low. This is suggestive of inadequate AVP secretion, which is consistent with central DI rather than transient gestational DI (where there is increased metabolism of AVP instead of inadequate secretion). The patient responded well to treatment with 1-deamino-8-D-VP, and she continues to require this medication at more than 15 weeks postpartum.

Conclusion: Abnormal blood flow to the posterior pituitary secondary to severe postpartum haemorrhage likely contributed to central DI by impairing AVP secretory capacity.

81. The effect of physical activity on glycaemic control in women with gestational diabetes

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Abstract

Background: Exercise is important in the management of women with gestational diabetes mellitus (GDM), but there are few studies of its role in improving glucose levels. The emergence of commercial activity monitors has allowed larger volumes of data to be obtained over longer time periods than has previously been achieved by clinically validated actigraphy. This allows more extensive examination of the relationship between physical activity and glycaemic control.

Method: Women enrolled in SMART MUMS WITH SMART PHONES (SMs2), a randomised controlled trial of text messaging support for women after GDM, are provided with a wrist-worn activity monitor (Garmin Vivoactive 4®) that tracks steps in their third trimester. The women check and record their fasting and 2 h postprandial blood glucose levels (BGLs). Of the 180 women who are planned to be recruited for SMs2, we included those who had corresponding daily step and BGL records. Days with <1000 steps were excluded to ensure data served to provide further information for the necessary support women during the postpartum require in times of social isolation and pandemic environments.

Table 1. Change in glucose per 1000 steps.

| BGL                  | Estimated change in BGL per 1000 steps (mmol/l) (95% CI) | Linear trend p-value |
|----------------------|----------------------------------------------------------|----------------------|
| Fasting              | −0.012 (−0.059, 0.035)                                    | 0.63                 |
| Post breakfast       | −0.061 (−0.195, 0.072)                                   | 0.36                 |
| Post lunch           | −0.082 (−0.191, 0.027)                                   | 0.14                 |
| Post dinner          | −0.046 (−0.228, 0.137)                                   | 0.62                 |
| Average post prandial| −0.044 (−0.110, 0.022)                                   | 0.19                 |

Fasting glucose versus steps recorded on the previous day; all other measurements versus steps on the same day.
as it is likely that the activity monitor was not worn. We examined the association between steps with BGLs with a linear mixed effects model.

Results: Ten women were included in this study. The mean age was 34.0 ± 4.0 years and BMI 26.2 ± 4.5 kg/m². Amongst these women, there were 90 days with step and BGL data available. The mean steps on the previous day was 481.45 ± 2574.57 and on the same day was 4798.2 ± 2311.03. The mean fasting BGL was 5.05 ± 0.43 mmol/l, post breakfast BGL 5.86 ± 0.57 mmol/l, post lunch BGL 6.13 ± 0.58 mmol/l, post dinner BGL 6.42 ± 0.69 mmol/l and average postprandial BGL 6.10 ± 0.47 mmol/l. There was a trend to increased steps on the previous day being associated with decreased fasting BGL, and for increased steps on the same day being associated with decreased post prandial BGL, with the highest effect after lunch. However, these trends did not meet statistical significance.

Conclusion: This study suggests a possible trend to an association between physical activity and improved glycaemia in GDM, which if sustained across the cohort would warrant a full trial of commercial activity monitors for all women with GDM.

82. Case description and literature review of severe asthma, steroid use and uterine scar rupture

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Abstract

Background: Regular and high dose steroid use is needed in medical complications in pregnancy especially with acute exacerbation of severe asthma. Reported obstetrics complications include preterm birth, chorioamnionitis and rarely uterine rupture in view of its impact on soft tissue degeneration. Uterine scar rupture has been reported as two case reports in women with previous surgical scar as well as de novo presentation in a twin pregnancy requiring early intervention.

Case description: A 39-year-old woman presented for medical review for concerns of an unplanned pregnancy around 21 weeks of gestation. This was her fourth pregnancy with three previous pregnancies managed with caesarean delivery for large for gestational age weight, likely cephalopelvic disproportion and severe uncontrolled asthma. Past medical history revealed childhood asthma with multiple hospitalisations to high-dependency care unit and other wards but never needing intubation. Her triggers were viral infections, change in weather and pregnancy. She also had nocturnal symptoms and poor sleep with reflux worsened by pregnancy at present. She was managed with high dose steroids up to 90 mg daily to manage her asthma with other regular inhalers and nebulisers. During her last pregnancy she presented with threatened preterm labour and early scar rupture was noted at the time of surgery. She was advised not to fall pregnant in view of recurrence of scar rupture. We would like to discuss measures of minimising her risk of scar rupture in the current high risk pregnancy by using alternative agents for steroid sparing effect such as Montelukast and other biological agents and review current literature of management of severe asthma in pregnancy.

83. Addressing healthcare provider knowledge about the long-term disease sequelae after hypertensive disorders of pregnancy

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Abstract

Background: Hypertensive disorders of pregnancy (HDP) including pre-eclampsia, gestational hypertension and chronic hypertension affect 5% to 10% of pregnancies. There are short- and long-term consequences for women following HDP, with long-term effects including increased risk of cardiovascular, cerebrovascular, and renal disease, and type 2 diabetes. There is limited knowledge of potential long-term HDP effects amongst healthcare providers (HCPs), and there exists no guidelines on how to design an educational package. This study aimed to assess HCP requirements and recommendations for an educational package on post-HDP health.

Method: Semi-structured telephone interviews, employing a qualitative thematic approach. HCPs who had completed an online survey in 2019 were invited to participate. Interviews were completed April to May 2020 and were recorded, transcribed and analysed using thematic analysis techniques.

Results: Twenty HCPs participated; 11 midwives, 5 obstetricians, 3 general practitioners with an obstetric diploma and 1 cardiologist. Three overarching themes were noted: ‘Materials’ (sub-categorised into content, format and distribution of the educational package), ‘Enablers’ and ‘Barriers’ (both sub-categorised into ‘Acquisition of knowledge’ and ‘Transmission of knowledge’). Major preferences for materials included content regarding HDP, long-term risks and recommendations on referral and long-term pathways. HCPs recommended case-based learning in a multidisciplinary format and distribution through professional bodies. ‘Enablers to the acquisition of knowledge’ included personal experience and ease of access to resources. ‘Enablers to the transmission of knowledge’ to other HCP and women involved interdisciplinary collaboration and appropriate timing of discussion. ‘Barriers to the acquisition of knowledge’ included obstacles to accessing resources. Perceived ‘Barriers to the transmission of knowledge’ included maternal health literacy and limited awareness of the importance to educate women.

Conclusion: Findings suggest that HCP education packages should address HDP’s long-term risks in a case-based, multidisciplinary format distributed through professional bodies. Enablers can be accentuated and barriers can be addressed to develop a well-tailored educational package.

84. Does the administration of corticosteroids for fetal lung maturity in women with pre-existing diabetes in pregnancy, increase the risk of neonatal hypoglycaemia or respiratory distress?

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Abstract

In 2017, 0.7% of women who delivered in NSW had Type 1 or Type 2 Diabetes Mellitus. Corticosteroids, in the form of either betamethasone or dexamethasone, have been routinely used to enhance fetal lung maturation and in women who are at risk of pre-term vaginal birth (<34 weeks’ gestation), and in some centres also, to women who have caesarean deliveries up to 39 weeks’ gestation. Administration of corticosteroids has been
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shown to reduce the rates of perinatal mortality, and also respiratory distress syndrome (RDS). With regard to women with pre-gestational diabetes, concerns have been expressed about the destabilising effect of corticosteroids on blood glucose level (BGL) control and the potential effect this may have on the mother and her baby. Women with pre-gestational diabetes receiving corticosteroids require admission to hospital for glycaemic management, causing anxiety for themselves and their families. Corticosteroid administration to women with poorly controlled diabetes may precipitate diabetic ketoacidosis (DKA) in the mother as well as acidosis in the fetus. Corticosteroid-induced maternal hyperglycaemia could also lead to subsequent hypoglycaemia in the neonate, and paradoxically in some studies an increased risk of RDS. At the tertiary centre where the authors practice, we currently admit women 1 week prior to elective delivery in order to administer corticosteroids and stabilise BGLs. We conducted a retrospective observational study at a tertiary centre in Sydney, in order to assess the risk of neonatal hypoglycaemia and RDS in women with pre-existing diabetes who were given corticosteroids for fetal lung maturation. A total of 410 cases were identified over the specified time period. The final data set consisted of 232 cases in 190 women. Antenatal corticosteroids were administered in 22.4% of the cases analysed. A comparison was made for the two main outcomes between women who were administered steroids and those who did not receive steroids prior to delivery. Paradoxically, significantly more of the women who were administered steroids gave birth to infants with RDS (25.5%), compared to women who did not receive steroids prior to delivery (8.9%). Although the rate of hypoglycaemia in neonates of women who received steroids was also higher (61.5%), the comparison with women not receiving steroids (46.7%) did not achieve statistical significance. Our results showed that the benefits of corticosteroid administration in women with pre-gestational diabetes is unclear.

85. Drawing the line: The impact of border closures on maternity care, a case report

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Abstract

The impact of COVID-19 in Australia reached far beyond the actual number of cases. Policy restricting travel and the way patients interacted with health systems, altered the face of maternity care. These effects were felt to be more profound amongst rural communities, as unpredictable and inconsistent state border closures disrupted standard processes of accessing healthcare. In July 2020, New South Wales (NSW) closed the border to Victoria following a daily total of 124 new cases of COVID-19. At this time, our case, a 37-year-old gravida 7 para 5, was 12 + 5 weeks pregnant. Her pregnancy was high risk (insulin-dependent gestational diabetes, IgA nephropathy and Graves’ disease), therefore, requiring management in a level 5 obstetric centre. The closest facility that could provide this care and offer the recommended fortnightly obstetrician review, was one 1 h by road, across state lines in Victoria. Therefore, she was faced with the prospect of spending the remainder of her pregnancy in isolation, or, alternatively, travelling >2.5 h to access equivalent care in NSW. The relationship between rural residence, travel time and poor perinatal outcomes is well established. This case demonstrates that border closures, while successful in attenuating the spread of COVID-19, have the potential to exacerbate known health inequalities by enforcing new remoteness on rural communities. Moreover, pregnancy is a time of traditionally increased medical observation, and the psychological impact of uncertain access to antenatal care during COVID-19 has been well documented. Changing border policies and their variation when implemented by different governments, serves as a reminder of the vulnerability of rural populations to access health systems that were not designed around state lines. Thus, we propose solutions including compassionate travel exemptions or negotiated cross-border ‘bubbles’, which take into consideration the ongoing need for border residents to access healthcare during COVID-19 outbreaks.

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86. Medical nutrition therapy for gestational diabetes mellitus in Australia: What has changed in 10 years and how does current practice compare with best practice?

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Abstract

Aims: To examine current Australian dietetic practice in the management of gestational diabetes mellitus (GDM) by comparing findings to a 2009 survey; and to the American Academy of Nutrition and Dietetics Nutrition Practice Guidelines; and assess the need for Australian guidelines.

Methods: Cross-sectional surveys of dietitians providing Medical Nutrition Therapy (MNT) to women with GDM were conducted in 2009 and 2019. The current abstract compares responses to questions on MNT between surveys.

Results: A total of 220 and 149 dietitians met inclusion criteria in the 2009 and 2019 surveys, respectively. Not all questions were answered by all respondents. The majority of respondents in both surveys (>60%) reported aiming for macronutrient targets consistent with a high carbohydrate (>45% energy), moderate protein (15%–25% energy), moderate fat (15%–30%) dietary intervention. Consistencies in key components of MNT found in 2009 continued in 2019 – such as topics covered. Inconsistencies in MNT found in 2009 also continued in 2019 including wide ranges in: target percentage of energy from carbohydrate (20%–
Abstract

Gestational diabetes mellitus (GDM) is becoming more prevalent, with the rate of women with GDM in NSW increasing from 8.3% in 2015 to 13.9% in 2019. There has been a simultaneous increase in number of women requiring induction of labour and pre-term deliveries. As such, there has been a corresponding rise in the number of women who require corticosteroids for foetal lung maturity. Optimising the glycaemic control in women with GDM who receive corticosteroids can sometimes be difficult. In the tertiary unit where the authors practice, the obstetric team have to contact the endocrine team for advice on optimising glycaemic control. This does not always happen in a timely fashion due to competing demands, or minimal staffing, especially after hours and overnight. Anecdotally we have noticed that patients are currently running hyperglycaemic following steroid doses suspected due to an insufficient increase in insulin doses being charted. In order to streamline this process and optimise glycaemic control, we implemented a protocol that can be followed by all staff members with ease. The protocol assumes that a 40% to 50% increase in insulin is required post Celestone administration. The required insulin doses can then be fine-tuned by the Endocrinology Registrar within office hours. We looked at a total of 42 women who delivered between an 18-month time period. Of these women, 26 received Celestone prior to implementation of the protocol and 16 were managed with the new protocol. Analysis of the glycaemic control in these women suggests that the protocol was effective in treating post-prandial blood glucose levels (BGLs), but was inadequate in treating fasting BGLs. Most women reverted back to pre-Celestone glycaemic control within 72 h from time of first Celestone administered. Often instances of elevated post-prandial BGLs was because the BGL was not measured pre-meal, or a supplemental dose of insulin was not administered. Implementation of this protocol has streamlined the process of glycaemic optimisation in women with GDM who receive corticosteroids in our hospital. Further titration of the protocol is likely required in order to ensure BGLs within target range.

88. Experiences after hypertensive disorders of pregnancy (women’s “post-HDP world”): A blood pressure postpartum (BP2) sub-study

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Abstract

Background: Hypertensive disorders of pregnancy (HDP) not only affect pregnancy outcomes but have implications for women’s ongoing health, including at least double the lifetime risk of cardiovascular disease and Type 2 diabetes. Blood pressure postpartum (BP2) is a currently recruiting, 3-arm randomised trial of follow-up and lifestyle behaviour change strategies in the first year after HDP (Optimised Usual Care with GP; Brief Education Intervention with physician/dietitian at Postpartum Clinic; Extended Lifestyle Intervention including 6 months Get Healthy Service telephone-based coaching). This qualitative sub-study within BP2 aimed to investigate the barriers and enablers to healthy behaviours after a pregnancy complicated by HDP.

Methods: Thirty-four women from all three arms of BP2 were interviewed March 2020 to April 2021, approximately 10 to 12 months postpartum (4–6 months after randomisation and intervention commencement). The semi-structured interviews were conducted by telephone, transcribed verbatim prior to thematic analysis, following the methods suggested by Braun and Clarke.

Results: The interviews explored women’s experiences following a HDP. Major themes included:

- Impact of a young baby on healthy lifestyles (exhaustion, limited time, costs, other priorities).
- Importance of support (partners, extended family, Get Healthy Service/ BP2 intervention).
- Awareness of HDP-related risks (varied recognition of risk of future cardiovascular disease, BP2 intervention brought greater awareness).
Moving on (plans for return to work both negative and positive impacts, baby developing, future pregnancies, post-COVID world).

Conclusion: Interviewees outlined varying views of their post-HDP world. Some women clearly embraced the future health implications and their ability to positively influence this through lifestyle, while others appeared overwhelmed by their current parenting demands. Perceptions varied with individual circumstances including support, previous experience of healthy practices, finances and access to the full intervention. Findings support potential utility of structured post-HDP follow-up, including psychosocial supports, and postpartum lifestyle intervention. However, future interventions should recognise that timing (and degree) of women's readiness to engage shows considerable variation.

89. Changes in the gut microbiota of women with gestational diabetes mellitus: A microbiome understanding in maternity sub-study

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Abstract

Background: A disruption to a balanced microbial ecosystem, known as dysbiosis, has been associated with multiple metabolic disorders, including gestational diabetes mellitus (GDM). However, the role of gut microbiota dysbiosis in the aetiology of GDM remains unclear, as presently, there is a deficit in longitudinal studies characterising microbiota signatures both prior to and following disease diagnosis. Thus, this study aims to investigate differences in gut microbiota composition between GDM and normoglycaemic women across all pregnancy trimesters, identifying changes in the microbiota which may predict or reflect disease onset.

Method: The gut microbiota profiles of 15 GDM (Australasian Diabetes in Pregnancy Society consensus diagnostic criteria) and 79 normoglycaemic pregnant women from the Microbiome Understanding in Maternity Study (MUMS) prospective cohort were analysed. Microbiota composition was examined via whole metagenomic shotgun sequencing of faecal samples collected from the first, second and third pregnancy trimesters. Taxonomic profiling was conducted using metagenomic phylogenetic analysis (MetaPhan2), and resultant data was processed to identify differentially abundant taxa between GDM and normoglycaemic groups.

Results: There were no significant differences in microbiota alpha or beta diversity between GDM and normoglycaemic women (P > 0.05). However, significant differences in gut microbiota composition were detected at class and species taxonomic levels between GDM and normoglycaemic women in all pregnancy trimesters (P < 0.05). Variations in bacterial abundance between groups were identified in early pregnancy prior to GDM diagnosis and persisted in mid to late gestation. The study found that classes Gammaproteobacteria and Deltaproteobacteria, and species Bacteroides dorei, Eggertella sp., Escherichia coli, Klebsiella oxytoca, Veillonella dispar and Bifidobacterium catenulatum were enriched in GDM compared to normoglycaemic women (P < 0.05). Conversely, class Clostridia and species Barnesiella intestinale, Bifidobacterium breve and Adlercreutzia equaciens were depleted in GDM compared to normoglycaemic women (P < 0.05). These aforementioned species were differentially abundant between groups in at least two pregnancy trimesters. Overall, there was a relative enrichment of bacteria identified as pathobionts and a depletion of bacteria recognised as commensal symbionts in the microbiota profiles of GDM compared to normoglycaemic women.

Conclusion: This study revealed that aberrations in the gut microbiota composition of women with GDM were present prior to disease diagnosis and persevered through pregnancy, suggesting an association between microbiota profile and GDM status. The microbiota signature of women with GDM should be further explored to determine its pathophysiological role and potential for use as a non-invasive predictive biomarker of the disease.

90. Cor triatriatum and pulmonary hypertension in pregnancy and labour: A case report and discussion of management

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Abstract

Background: Cor triatriatum sinistrum (CTS) is a very rare condition comprising 0.1% to 0.4% of congenital heart disease. It is characterised by a fibromuscular septum separating the left atrium into two chambers. It can lead to arrhythmias, thrombosis, pulmonary oedema and pulmonary hypertension. The condition is usually diagnosed in infancy, however, haemodynamic changes associated with pregnancy can trigger decompensation in undiagnosed CTS.

Case summary: A 24-year-old female (G8P3) presented to a regional NSW hospital at 25 weeks gestation with pulmonary oedema and a suspected viral respiratory infection. She was transferred to our tertiary facility for ongoing management. A transthoracic echocardiogram demonstrated CTS (membrane opening <0.5 cm2) with profoundly dilated right ventricle, severe tricuspid incompetence and severe systemic-level pulmonary hypertension. Obstetric ultrasound confirmed single live intrauterine pregnancy with normal growth and wellbeing. Prophylactic enoxaparin, metoprolol and frusemide were commenced. Post-stabilisation she was monitored closely as an outpatient. At 31 weeks gestation the patient was re-admitted and administered betamethasone for fetal lung maturation. An induction of labour with mechanical ripening and artificial rupture of membranes was planned for 34 weeks gestation. Iloprost was administered throughout labour. Early regional anaesthesia with slow titration was instituted to minimise haemodynamic effects. Oxytocin was deliberately not utilised due to the side-effect profile worsening cardiac function. Labour did not establish and the patient underwent an uncomplicated lower-segment caesarean section with invasive monitoring and postoperative transfer to intensive care unit. Low dose metoprolol was continued throughout and estimated blood loss was 350 ml. A healthy 2.5 kg female infant was delivered with normal cord blood gases. CTS was managed with resection of the membrane and mitral annuloplasty 3 months post-delivery. After 4 years of follow-up the patient is well with normal cardiac function and pulmonary pressures.
91. Use of intravenous fluids in labour – a single centre online survey of obstetricians’ and anaesthetists’ perspectives

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Abstract

Background: There is conflicting evidence regarding the benefits or harms with intrapartum intravenous fluid therapy (IVT). Our previous retrospective study investigating local IVT prescription practices in labour found 63% (136/217) of women with low risk pregnancies received a median of 2 l of compound sodium lactate (CSL) solution and women who received IVT had longer and complex labours compared to those who did not. A survey was conducted to explore factors influencing intrapartum IVT prescription practices.

Methods: Obstetricians and anaesthetists at a single tertiary centre were identified via employment records. Participants were invited to complete an online survey that ran for 6 weeks. Participants’ demographics, intrapartum IVT choice, and IVT prescription patterns were assessed.

Results: A total of 177 potential participants were identified and 45 responded to the survey. Sixty-nine percent (n = 31) were obstetricians and 93% chose CSL as their preferred IVT. Sixty-one percent identified IVT as appropriate pre-emergency caesarean with the most common IVT indications cited as hypotension (40%), haemorrhage (30%) and anaesthesia (21%). Most would administer IVT boluses for hypotension (100%), non-reassuring cardiotocographs (CTG) (74%), spinal anaesthesia (66%) and tachycardia (56%). The top 3 reasons for IVT infusions were oxytocin use (96%), prolonged second stage of labour (45%) and postpartum haemorrhage (34%).

Conclusion: All would not prescribe IVT for intravenous antibiotics.

92. Renal cell carcinoma in pregnancy: A case report and summary of case

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Abstract

Introduction: Renal cell carcinoma (RCC) is a rare diagnosis in pregnancy. We report a case of a pregnant woman with a RCC and summarised characteristics of 37 further published case reports over the last 20 years.

Our case: A 34-year-old primigravida woman presented with a left solid renal mass (56 × 71 × 55 mm) discovered incidentally on a dating scan at 9 weeks gestation. Fine needle aspiration was suggestive of clear cell RCC. An abdominal magnetic resonance imaging (MRI) at 13 weeks gestation demonstrated growth of the solid heterogeneous renal mass (80 × 52 × 47 mm). Chest x-ray was normal. After discussion in a multi-disciplinary team, the patient underwent a successful laparoscopic partial nephrectomy at 23 weeks gestation with post-operative ileus and chyle leak but without obstetric complication. Histopathology confirmed type 1 papillary RCC, grade 2, stage pT2aNx. She delivered a 3 kg baby girl at 39+ weeks gestation via caesarean section due to obstructed labour. She remained recurrence free 12 months post-operatively.

Summary of cases: Women had a median age of 32 years with median gravidity of 2 and were diagnosed at a median gestation of 17 weeks. Seventy-three percent were operated on antenatally at a median gestational age of 20 weeks while 27% were post-natally. Most women presented with flank, groin or abdominal pain (34%) or incidentally on antenatal imaging (34%), followed by haematuria (29%), hypertension (13%), palpable flank mass (8%) and urinary symptoms. Right sided tumours occurred more frequently (53%). Most RCCs were clear cell type (62%), followed by chromophobe (27%), papillary (8%) and cystic (3%). Sixty-eight percent had open, while 32% had laparoscopic nephrectomies and 82% were radical while 18% were partial nephrectomies. Pregnancies reached a median gestational age of 38 weeks with half delivering vaginally and one-third via caesarean. There were 2 spontaneous abortions, 2 terminations and 1 neonatal death. Two women died from metastatic disease.

Conclusion: A database to collate additional RCC data may help inform future practice.

93. Case study: Euglycemic diabetic ketoacidosis resulting in preterm delivery

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Abstract

Case: A 31-year-old gravida 2 parity 1 presented at 33 weeks gestation with 2 days of vomiting and decreased oral intake. History was significant for schizophrenia on recently up-titrated clozapine 300 mg daily and overt...
Milk-alkali syndrome is a rare cause of hypercalcaemia characterised by severe metabolic acidosis (pH 7.15, HCO₃⁻ 6 mmol/l) and ketosis with ketones 6.5 mmol/l (<1.5). Blood glucose was 7.7 mmol/l, lactate 1.4 mmol/l (<2.0) and HbA1c (6.2%). Infectious screen was normal. Clozapine level was supratherapeutic 611 μg/l (<600). Intravenous fluids were commenced for diagnosis of starvation ketosis. However, after persistent ketosis, eucregicmic diabetic ketoacidosis was diagnosed, insulin dextrose infusion was commenced, and clozapine and metformin were withheld. Though ketosis improved, cardiotocography (CTG) became abnormal with no variability or accelerations. The woman underwent emergency caesarean section with no steroid cover and a live 2805 g neonate was born in poor condition requiring resuscitation and respiratory support. She recovered well with cessation of the insulin infusion day one postoperatively and clozapine subsequently restarted. Post-partum glucose tolerance test was positive for diabetes and pancreatic autoantibodies for Type 1 diabetes-mellitus were negative.

Discussion: In this case, eucregicmic diabetic ketoacidosis (DKA) is the likely diagnosis with pregnancy, clozapine and reduced oral intake or infection being contributing factors. Pregnancy is associated with maternal insulin resistance and ketogenesis, progressively worsening in third trimester. DKA in pregnancy has high maternal and fetal mortality and morbidity (15% fetal mortality and 46% preterm birth). Clozapine and second generation antipsychotics can produce insulin resistance and have been associated with DKA outside pregnancy. Starvation and illness can also exacerbate ketosis.

Conclusion: It is imperative that metabolic acidosis in pregnancy is investigated and managed promptly as recognition of eucregicmic DKA is vital due to the risk of maternal and fetal morbidity. Further, clozapine therapy in pregnancy warrants close observation particularly in the setting of diabetes due to the potential risk of DKA.

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94. When simple remedies go wrong – A rare case of severe hypercalcaemia in pregnancy
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Abstract
Milk-alkali syndrome is a rare cause of hypercalcaemia characterised by the triad of hypercalcaemia, metabolic alkalosis and renal insufficiency associated with the ingestion of calcium and absorbable alkali. It is an uncommon cause of severe hypercalcaemia in pregnancy, with <10 cases reported in the literature.¹ ² We report the case of a 33-year-old primigravida who presented at 33+1/40 with a 1-week history of nausea, vomiting, severely reduced oral intake, epigastric pain, reflux and constipation. Her initial bloods showed severe hypercalcaemia (corrected calcium of 3.60 mmol/l), an acute kidney injury (Cr 99 µmol/l) and a metabolic alkalosis (pH 7.64, pCO₂ 39 mmHg, bicarbonate of 41 mmol/l). Hypochloraemia, hypomagnesaemia and hypokalaemia were present. She had a normal calcium level a few months prior. Her background is significant for class II obesity (body mass index (BMI) 35.0) and gastro-oesophageal reflux disease with worsening symptoms throughout her pregnancy, particularly in the days leading to her admission. She has no history of pancreatitis, fractures, or renal calculi. There was no family history of hypercalcaemia. Her medications included pantoprazole 40 mg per day and ondansetron 4 mg PRN. Further history revealed the consumption of 1 to 1.5 litres of milk and 8 to 10 tablets per day of the antacid Rennie. Each tablet contains 680 mg of calcium carbonate resulting in a daily intake of elemental calcium between 3800 and 4300 mg. Subsequent investigations revealed a low but not suppressed parathyroid hormone (PTH; 1.3 pmol/l). Her serum angiotensin converting enzyme (ACE) was normal. Her 1,25-hydroxyvitamin D was low at 27 g/l. Her hypercalcaemia resolved with intravenous fluids and cessation of antacids. Her electrolytes were replaced. Her corrected calcium remained normal 1 week following her discharge from hospital. This case highlights the potential harm of using excessive doses of over-the-counter calcium containing antacids in women who suffer from reflux in their pregnancy.

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95. GDM and the COVID-19 pandemic – An audit of pregnancy outcomes
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Abstract
Background: During the COVID-19 pandemic, the model of care for gestational diabetes mellitus (GDM) management at Bankstown-Lidcombe Hospital was adapted to include telehealth consultations to minimise unnecessary face to face interactions and mitigate contagion risk.
Aim: Assessment of pregnancy outcomes before and during the COVID-19 pandemic.
Methods: We analysed prospectively collected data of singleton GDM pregnancies (International Association of the Diabetes and Pregnancy Study Groups (IADPSG)/WHO2013 criteria). The pre-COVID period defined as March 2016 to February 2020 and COVID period from March 2020 to March 2021. Baseline characteristics evaluated included age, ethnicity, pre-pregnancy body mass index (BMI), gestational age at GDM diagnosis, diagnosis of GDM <20 weeks, HbA1c and 75 g OGTT result. Outcomes assessed were need for insulin therapy, number of medical reviews, incidence of excessive weight gain (EGWG) during pregnancy (per IOM), pre-term delivery (<37 weeks) and caesarean section. Neonatal outcomes included infant gender, birthweight, small for gestational age (SGA) (<10th percentile) and large gestational age (LGA, >90th percentile), shoulder dystocia, neonatal hypoglycaemia and jaundice. Independent sample t-tests and chi-square/Fisher’s exact tests were used for continuous and categorical data, respectively. P<0.05 indicated statistical significance.
Results: A total of 1896 GDM women were included in this study. 292 (15.4%) during COVID and 1604 (84.6%) pre-COVID. During COVID, there was lower mean 1 h glucose ($p < 0.0001$), 2 h glucose ($p < 0.001$), HbA1c ($p < 0.001$), later diagnosis of GDM ($p < 0.0001$) and a lower proportion diagnosed before 20 weeks ($p < 0.05$) compared to pre-COVID. There were no other differences in baseline characteristics. During the COVID period, there were similar rates of insulin use (48.6% vs. 43.0%), number of medical reviews (7.0 vs. 6.9 episodes), rates of EGWG (39.4% vs. 36.0%), pre-term delivery (6.2 vs. 6.1), caesarean section (37.0% vs. 34.6%), SGA (8.6% vs. 8.4%), LGA (14.4% vs. 11.4%), shoulder dystocia (1.0% vs. 0.2%), neonatal hypoglycaemia (9.2% vs. 10.2%) and neonatal jaundice (3.8% vs. 5.0%) compared to pre-COVID (all outcomes, $p = NS$).

Conclusions: Increased use of teleconferencing during the initial 12 months of the COVID pandemic lead to similar pregnancy outcomes compared to the pre-COVID period. A model of care involving teleconferencing is likely to be retained as the ‘new-normal’ in a post-COVID world. Future audits will ascertain whether comparable outcomes are maintained.

96. A retrospective study on patient factors in the choice between metformin and insulin for gestational diabetes

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Abstract

Introduction: The use of metformin in the management of gestational diabetes mellitus (GDM) is increasing in Australia. After failing lifestyle therapy, women are often given the initial choice of metformin or insulin. We explore the characteristics of women who choose metformin compared to women who choose insulin therapy in a culturally and linguistically diverse population in Sydney, Australia.

Objective: To investigate patient factors in the choice of metformin or insulin in gestational diabetes.

Method: We conducted a retrospective study of singleton pregnancies delivered between 2016 and 2018 at Liverpool Hospital, Sydney, Australia that were complicated by gestational diabetes and who were unable to be managed on medical nutritional therapy alone. The women were given the choice of either metformin or insulin as initial pharmacologic management. Characteristics and pregnancy outcomes of each group were analysed using chi-square and t-test.

Results: Six hundred and eighty-two women initially chose insulin compared to 263 who chose metformin. Of the 263 women who chose metformin, 75% (n = 193) of them were younger than 35 years of age compared to 64% (n = 432) of the insulin group ($p < 0.0001$). In addition, women who chose insulin were more likely to have had GDM in the past (32.2% compared to 23.6%, $p = 0.01$) and/or prior exposure to insulin therapy (20.5% compared to 9.1%, $p < 0.0001$). There were no significant differences in the body mass index, ethnicity, gestational weight gain and pregnancy outcomes between the two groups. In particular, the risk of birthweight below 2000 g was not significant between metformin or insulin (0.6% compared to 2.2%, $p = 0.561$).

Conclusion: This study reflects real life clinical practice where women were given a choice in managing their gestational diabetes. The study helps characterise the women who are more likely to choose one therapy over the other with the metformin group more likely to be younger with no prior history of GDM or exposure to insulin administration. There were no significant differences in pregnancy outcomes between metformin or insulin, and the risk of birthweight below 2000 g was not significantly different between the 2 groups.

97. Impact of pre-gestational type 1 and 2 diabetes and obesity on perinatal outcomes: A 10-year retrospective cohort study

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Abstract

Background: Prevalence of pre-gestational type 2 diabetes mellitus (T2DM) is increasing due to increasing obesity rates, sedentary lifestyle and later childbearing ages. We compared the perinatal outcomes of women with T2DM or type 1 diabetes mellitus (T1DM) to women without diabetes.

Methods: A retrospective cohort study was conducted for all singleton births >20 weeks’ gestation at Western Health in Melbourne, Australia from 2010 to 2019 including women with pre-gestational diabetes and without diabetes. The control group comprised 2 consecutive women who birthed before and after each index T1DM or T2DM case.

Antenatal and birth outcomes were extracted from Birth Outcomes Systems database. Analysis using t-tests, chi-squared, univariate and multivariate logistic regression were performed.

Results: Women with T2DM (n = 317) were older (T2DM vs. T1DM vs. control, 33.4 vs. 29.7 vs. 29.5 years, $p < 0.001$), heavier (body mass index (BMI) 34.5 vs. 26.8 and 25.4 kg/m2, $p < 0.001$), and more likely to be multiparous (75.4% vs. 55.4% and 61.1%, $p < 0.001$). When compared to their T1DM counterparts (n = 92), those with T2DM had lower earliest and last HbA1c levels (6.6% vs. 7.8%, $p < 0.001 and 5.9% vs. 6.9%, $p < 0.001$). Women with T2DM and T1DM compared to controls were more likely to have a large for gestational age (LGA) baby (T2DM: adjusted odds ratio (aOR) (95% CI): 2.64 (1.82–3.82), (T1DM: aOR (95% CI): 5.14 (3.01–8.79)), neonatal hypoglycaemia (T2DM: 9.32 (5.96–16.2), T1DM: 27.7 (15.6–49.3)), primary caesarean section (T2DM: 1.93 (1.43–2.61), T1DM: 1.98 (1.17–3.34)) and perinatal death (T2DM: 17.5 (5.2–59.6), T1DM: 12.1 (2.1–67.0)) after adjusting for BMI. BMI was a significant contributor to LGA and neonatal hypoglycaemia outcomes.

Conclusion: Despite advancing technologies to improve glycaemic control, there is still a disparity in perinatal outcomes between women with T1DM and T2DM compared to women without diabetes. Further studies are required to examine factors contributing to higher perinatal mortality in women with pre-gestational diabetes.

98. Perinatal and child factors mediate the association between pre eclampsia and offspring school performance

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Abstract
Preeclampsia complicates 2% to 8% of all pregnancies and is a major cause of maternal and perinatal morbidity and mortality. It is thought that preeclampsia is adversely associated with long-term neurodevelopmental and cognitive outcome in the offspring. However, there are inconsistencies in the available epidemiologic evidence exploring the association between preeclampsia and long-term neurodevelopmental, behavioral and cognitive outcomes, with unmeasured or unrecognized confounders being a particular concern in the current literature. Therefore, the aim of this study was to investigate the association between preeclampsia diagnosed in pregnancy and subsequent impact on offspring school performance, taking into account important perinatal and child factors. We performed a population-based cohort study using record linkage of state-wide data. We evaluated a total of 341,779 liveborn singleton children born at 28+ weeks gestation in New South Wales, Australia, who had Grade 3 record-linked education outcomes via the National Assessment Program – Literacy and Numeracy (NAPLAN) between 2009 and 2014. Of these, 22,657 (6.6%) were born to mothers with preeclampsia and were compared to those without in utero exposure. Robust multivariable Poisson models were used to determine adjusted relative risks. Crude models demonstrated increased risk of scoring below the National Minimal Standard in all five domains (reading, writing, spelling, grammar and punctuation, and numeracy) for children exposed to preeclampsia ranging from RR 1.13 (95% CI: 1.04, 1.24) for reading to RR 1.19 (95% CI: 1.09, 1.30) for numeracy. However, these differences were attenuated once adjusted for perinatal and child factors, with gestational age at birth being the most important perinatal factor, followed by small for gestational age. The poorer educational performance experienced by children born to women with preeclampsia appears largely attributable to perinatal and childhood factors, suggesting an opportunity to improve school performance in children exposed to preeclampsia by optimising these perinatal factors, in particular, gestational age at birth.

99. Influence of aspirin on obstetric outcomes in women with pre-gestational diabetes: A South Western Sydney cohort study

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Abstract
Background: Women with pre-gestational diabetes mellitus (PGDM) are at an increased risk of preeclampsia. Initiation of prophylactic aspirin prior to 16 weeks of gestation in these women has been shown to reduce their risk of preeclampsia. Our study, aimed to investigate the influence of prophylactic aspirin on obstetric outcomes in women with PGDM.

Method: A retrospective audit of data from pregnant women with PGDM from 2 centres in South-Western Sydney from January 2005 to June 2020 was conducted. Data were obtained from a district wide electronic database, hospital medical records and partially prospectively collected data. The outcomes examined were preeclampsia, preterm delivery (<37 weeks) and newborn birth weight. Early preeclampsia was defined as <34 weeks and late preeclampsia was defined as 34 weeks or greater.

Results: Of 494 women, 124 (25%) had Type 1 diabetes mellitus and 52 (11%) women were prescribed prophylactic aspirin before 16 weeks of gestation. The dose of aspirin most commonly taken was 150 mg (50%). Women who were prescribed aspirin before 16 weeks of gestation were more likely to be taking calcium but did not otherwise significantly differ compared to women not taking aspirin. Preeclampsia overall developed in 57 (12%) women and was early-onset preeclampsia in 24 (5%) women. In the women prescribed aspirin, 8 (15%) women developed preeclampsia compared to 49 (11%) in those who were not prescribed aspirin (p = 0.2). Aspirin use was not associated with a statistically significant difference in birth weight percentile (57 vs. 63, p = 0.02). A higher number of preterm deliveries (21 (41%) vs. 97 (23%), p < 0.05) was observed in women who were prescribed aspirin. This was also observed post adjustment for age, primigravida and other comorbidities.

Conclusion: This retrospective audit demonstrated a higher rate of preterm delivery in women with pre-gestational diabetes who were prescribed aspirin. There was no difference in the rate of preeclampsia and newborn birthweight.

100. Metformin use in gestational diabetes mellitus: A tertiary hospital experience
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Abstract
Introduction: The use of metformin in the treatment of gestational diabetes mellitus (GDM) is variable in Australia and worldwide. There is strong evidence that metformin is safe and efficacious during pregnancy in the short term.1 During the COVID-19 pandemic, Fiona Stanley Hospital offered women metformin as an alternative to insulin where clinically appropriate.

Aim: The aim of this study was to describe the clinical characteristics of the women receiving different treatments, and assess the efficacy and safety of metformin therapy in women with GDM.

Method: We retrospectively analysed the medical records of 157 women with GDM requiring pharmacotherapy at our site over nine months. Women were allocated to four treatment groups: metformin monotherapy (Group A), insulin monotherapy (Group B), metformin added to insulin (Group C) and insulin added to metformin (Group D).

Results: There was no difference in the mean age (p = 0.30) and ethnicity (p = 0.75) of the four treatment groups. Women commenced on insulin therapy (Group B) had higher body mass index (BMI) (p = 0.03) and were more likely to have previous history of GDM (p ≤ 0.01). Eighty-three women with GDM were treated with metformin...
monotherapy during the study period. However, 60% of them needed addition of insulin to achieve glucose control. Sixty-six percent of women reached optimal blood sugar control with less than maximum dose of metformin. Thirteen percent of the women experienced gastrointestinal side effects, however, there were no unplanned reviews or unplanned admissions noted during the study period. This group was commenced on therapy later in the pregnancy leading to shorter mean treatment duration (6.42 weeks) compared to other groups (11.16, 11.58 and 14.62 weeks for Groups B, C and D, respectively) Group D was able to avoid insulin for a mean duration of 3.58 weeks when on metformin alone. Among the four groups there were no significant difference in neonatal complications ($p = 0.47$), birth weight ($p = 0.80$) and neonatal intensive care unit (NICU) ($p = 0.92$) admissions. Fewer total maternity complications ($p < 0.01$) were noted in Group A but this was driven by lower post-partum haemorrhage rates.

**Conclusions**: The metformin treated group had lower BMI and were at later gestational stage when metformin was commenced and there were no significant differences in neonatal outcomes as compared to the insulin group. However, 60% of women required addition of insulin and 13% had gastrointestinal side effects.

**Reference**

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**101. Influence of tight blood pressure control in women with chronic hypertension on obstetric outcomes in women with pre-gestational diabetes: A South Western Sydney cohort study**

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**Abstract**

**Background**: Hypertension is associated with poorer outcomes in pregnancy. There is conflicting evidence regarding the pregnancy effects of tighter blood pressure control in the first trimester. Our study aimed to investigate associations between tight blood pressure (BP) control and pregnancy outcomes in women with chronic hypertension and pre-gestational diabetes mellitus (PGDM).

**Method**: A retrospective audit of data from pregnant women with PGDM from 2 centres in South-Western Sydney from January 2005 to June 2020 was conducted. Data were obtained from a district wide electronic database and hospital medical records. Women with a history of chronic hypertension were identified from this cohort. Pregnancy outcomes examined were preeclampsia, preterm delivery (<37 weeks) and birthweight percentile in women with tight BP control ($\geq 135/85$ mmHg) compared to those with less tight BP control in the first trimester ($>135/85$ mmHg).

**Results**: There were 494 women in the cohort and 46 had a history of pre-pregnancy chronic hypertension. Tight BP control in the first trimester was seen in 30 (65.2%) women. There were no significant differences between tight and less tight BP groups in age, number of in vitro fertilization pregnancies, smoking, pre-pregnancy angiotensin converting enzyme (ACE)/angiotensin receptor blocker, calcium, and aspirin use. However, women with less tight BP control had a significantly higher body mass index (BMI). There was no significant difference between the groups in birth weight percentile (mean: 50 (28) vs. 46 (27), $p = 0.69$), preeclampsia (26.7% vs. 12.5%, $p = 0.24$) or preterm delivery (72% vs. 77%, $p = 0.54$). On multivariate analysis there was still no association between tight BP control and preterm delivery, preeclampsia rate and birthweight percentile after controlling for age, aspirin, calcium use and comorbidities.

**Conclusion**: In our study, first trimester tight BP control in women with PGDM and chronic hypertension was not associated with a change in birthweight percentile, or preterm delivery. A larger prospective study would help determine the effect of first trimester BP control on pregnancy outcomes.

**102. It’s enough to make you sick: Pregnant women are commonly denied medications to treat hyperemesis gravidarum**

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**Abstract**

**Background**: Severe nausea and vomiting of pregnancy (NVP) and hyperemesis gravidarum (HG) are serious complications associated with significant maternal-infant morbidity and mortality. Adequate treatment is critical for optimising maternal and infant health, but data on women’s experience in managing their illness with medications is largely absent.

**Methods**: Online, national survey of women who are currently or have previously experienced severe NVP or HG, distributed through the HG consumer groups, Hyperemesis Australia. The survey was distributed between July and September 2020, with results collected and stored using REDCap.

**Results**: Among 249 respondents, 242 (97%) reporting taking one or more medications to treat NVP/HG. The majority of women (195; 78%) reported receiving a formal diagnosis of HG, with 163 (65%) being admitted to hospital on at least one occasion. Approximately one in four ($n = 68$; 27%) women reported being denied a medication by a health care professional during pregnancy. Medications most commonly denied included doxylamine ($n = 45$) and ondansetron ($n = 16$) and involved interactions with pharmacists ($n = 44$) and medical practitioners ($n = 19$). Despite presenting a prescription, eight women reported pharmacist refusal to dispense doxylamine, ondansetron, or prednisolone. Reasons for denial included being told the medications were not recommended or safe for pregnant women, or that women were not sick enough to warrant the medication.
103. Predictors for insulin use in gestational diabetes mellitus

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Abstract

Background: Gestational diabetes mellitus (GDM) affects about 15% of pregnancies in Australia, with approximately 30% of those diagnosed with GDM requiring insulin therapy for the treatment of maternal hyperglycaemia. There are severe well-known risk factors for developing GDM, but there remain limited studies which show how these can be used to predict need for insulin treatment in women.

Aims: To investigate predictors of insulin therapy in women diagnosed with GDM from an oral glucose tolerance test (OGTT) performed during pregnancy.

Materials and methods: This is a retrospective cohort study of 2048 singleton pregnancies complicated by GDM between 2016 and 2017 at a single, large health network in Melbourne, Australia. Data was obtained from hospital record and pathology result systems. Univariable and multivariable logistic regression models were fit to the data to obtain crude and adjusted odds ratios.

Results: In total, 31.6% of women required insulin therapy during pregnancy. Those requiring insulin had a higher fasting and 1-h OGTT result, and were more likely to be diagnosed from their fasting result. Independent predictors of insulin use included maternal age, body mass index (BMI), being born in the South Asia region, previous pregnancy complicated by GDM, previous birthweight of >90th percentile and results from the OGTT. Smoking status, conception by in vitro fertilisation, pre-existing hypertension and being of Aboriginal and Torres Strait Island background were not found to be predictors in our model. The final predictive model had an area under the receiver-operating characteristics (ROC) curve of 0.7442 (95% CI 0.720–0.767).

Conclusions: This study highlights the possible predictors of insulin use in those diagnosed with GDM, informing counselling for women who are newly diagnosed with gestational diabetes.

Reference

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104. Use, experiences and perceptions of medicines for treating severe nausea and vomiting of pregnancy or hyperemesis gravidarum: An Australian consumer survey

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Abstract

Background: There is little data on contemporary patterns of antiemetic use or women’s experiences when using such agents in the treatment of severe nausea and vomiting of pregnancy (NVP) or hyperemesis gravidarum (HG).

Methods: Online, national survey of Australian women who are currently or have previously experienced severe NVP or HG, distributed through the HG consumer group, Hyperemesis Australia between July and September 2020.

Results: There were a total of 326 respondents with a mean age of 33 years, of which 39% were currently pregnant. The most commonly used anti-emetic was ondansetron (81%), followed by pyridoxine (62%), doxylamine (62%), and metoclopramide (62%). Nearly all (95%) women who reported using ondansetron commenced it within the first trimester. More than half of respondents reported using ondansetron first-line. Most women reported one or more side effects to anti-emetics, with 1 in 3 women stopping metoclopramide because of side effects, compared with 15% for ondansetron and 11% for doxylamine. When rating perceived effectiveness on a Likert scale of 1 (not very effective) to 5 (very effective), ondansetron (mean ± standard deviation 3.8 ± 1.0), corticosteroids (3.8 ± 1.3) and doxylamine (3.6 ± 1.2) were rated much higher than metoclopramide (2.3 ± 1.2). In assessing attitudes towards medication use during pregnancy, while the vast majority of women (77%) agreed that it is better for the fetus to use medicines and get well than to have an untreated illness, 44% mentioned using less medicine than needed due to being pregnant. Notably, nearly half (46%) respondents said that they had heard of the SOMANZ guidelines for treating NVP/HG (mainly through online support groups), with 56% saying that they reassured them of the safety of medicines.

Conclusions: The study findings demonstrate large variability in antiemetic use during pregnancy, with ondansetron appearing to be increasingly utilised as first-line agent.
105. Diabetes of the exocrine pancreas in pregnancy: Cases series of an emerging condition

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Abstract
Background: Women with diseases of the exocrine pancreas are predisposed to insulin deficiency, presenting as diabetes of the exocrine pancreas (DEP).1,2 Pregnancy can complicate the management of pre-existing DEP or unmask diabetes mellitus (DM), which may be misinterpreted as uncomplicated gestational DM (GDM). We describe a large series of pregnant women with DEP or GDM on a background of disease of the exocrine pancreas.

Methods: An antenatal database search identified 11 consecutive patients managed through the tertiary centre at John Hunter Hospital, Newcastle from 2012 to 2021.

Outcomes: Mean age was 26.5 years and 8 were primipara (Table). All 11 women were insulin-treated during pregnancy, five were on insulin preconception including one via an insulin pump. Two women with pre-existing DEP not requiring insulin preconception, commenced insulin at week 8 of pregnancy. Four women were screened and diagnosed with GDM at weeks 12, 19, 28 and 28, and commenced insulin at weeks 24, 19, 30 and 31 of gestation, respectively. One of these four women had a negative early screen at week 12, but required insulin following steroid use for exacerbation of cystic fibrosis. Pregnancy was complicated by pre-eclampsia in two women, and one developed ketosis requiring intravenous insulin.

Discussion: In the general population, DEP is more common than Type 1 DM, and confers a higher risk of sub-optimal glycaemic control compared to Type 2 DM despite a need for early insulin initiation.4 DEP may be underrepresented in our database due to misclassification.5 Evidence to guide antenatal management is lacking, but women are at potential risk of complications. Early diabetes screening is recommended in women with diseases of the exocrine pancreas.

| Table | Pre-existing DEP | Disease of the exocrine pancreas with DM (n = 6) |
|-------|-----------------|-----------------------------------------------|
| Age (yrs) | 26.5 ± 3.7 | 33.0 ± 3.3 |
| Prandias | 5 | 5 |
| Duration of DEP (yrs) | 56.4 ± 7.4 | - |
| Cardiopulmonary | - | - |
| Acute necrotizing pancreatitis | 3 | 3 |
| Chronic pancreatitis | 0 | 0 |
| Total Pancreatitis | 3 | 3 |
| Pancreatic enzyme replacement | 6 | 6 |
| Pre-conception MHTs | 4/11 | - |
| Pre-conception insulin therapy | - | - |
| Gestational age at screening and diagnosis | 11/14 (86%) | 11/14 (86%) |
| Gestational age at insulin therapy (comparing commencing insulin therapy) | 0 weeks (0%) | 0 weeks (0%)
| Post-insulin dose (units) | 20 ± 7.5 | 20 ± 7.5 |
| Women requiring hospital admission prior to delivery (total number of admissions) | 4/11 | 2/11 |
| Gestational age at delivery (weeks) | 38.3 ± 2.3 | 37.5 ± 2.0 |
| Birth weight (g) (SGR) | 2520 (2496 – 2568) | 2707 (2520 – 2946) |

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107. Maternal bradycardia in a patient with preeclampsia and HELLP syndrome

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Abstract
Case summary: We report a case of maternal bradycardia in a 34-year-old primigravida patient with preeclampsia associated with haemolysis, elevated liver enzymes and low platelet count (HELLP) syndrome at 30+4 gestation. The woman’s blood pressure, liver function tests and platelets initially improved following betamethasone therapy. Forty-eight hours following the second dose of betamethasone the patient complained of severe epigastric pain accompanied by an abrupt fall in pulse rate from 85 to 40 beats per minute (bpm), worsening of hypertension, liver enzymes and platelet count. Electrocardiography revealed sinus bradycardia but was otherwise normal. Serum potassium, thyroid function and high sensitivity troponin were also unremarkable. The woman proceeded to have an urgent caesarean section delivering a live male of birth weight 1248 g. Postpartum, in recovery, the woman’s pulse had risen to 60 bpm and epigastric pain resolved. Transthoracic echocardiography was normal.

Discussion: Preeclampsia is a pregnancy-specific syndrome which can affect multiple organs, including alterations in cardiovascular haemodynamics. Transient maternal bradycardia with preeclampsia and HELLP syndrome has been previously described in several case studies.1–4 The pathophysiology of this is not understood, but postulated mechanisms include impaired cardiopulmonary baroreflex, increased vagal tone due to the elevated levels of proinflammatory cytokines, and disturbance in the autonomic control of heart rate.5 Maternal bradycardia may be a sign of severe preeclampsia.

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108. Bilateral subchondral insufficiency fractures of the femoral head in a postpartum woman who presents with pregnancy and lactation associated osteoporosis
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Abstract
Case description: A 40-year-old gravida 2 para 1 woman presented with atraumatic pain in her left hip and right midfoot seven days postpartum on the background of a previous subchondral insufficiency fracture (SIF) of the right femoral head diagnosed in the second trimester of her pregnancy and was managed conservatively with non-weight bearing. Her medical history included a previous stress fracture of the right hip in 2012. Magnetic resonance imaging (MRI) demonstrated a nondisplaced SIF of the left femoral head with bone marrow oedema and a possible early stress fracture of the right fifth metatarsal bone. Bone mineral density demonstrated low Z scores (lumbar spine −1.3, right femoral neck −2.1, left femoral neck −1.3). Screen for secondary causes of osteoporosis was unremarkable. A diagnosis of pregnancy and lactation-associated osteoporosis (PLO) was made. The patient was managed conservatively with no weight bearing on her left hip. Follow up at six months post-partum showed complete resolution of her symptoms.

Discussion: PLO is a rare condition in pregnant and postpartum women and is infrequently associated with fragility fractures in sites such as the vertebrae, hips, ankle or wrist1–4. Its pathophysiology is poorly defined. The involvement of multiple fracture sites in our patients suggests a global process. Diagnosis is often challenging as a presentation with pelvic and hip pain in pregnancy are common and often attributed to soft tissue injury, arthritic pain or symphysis pubis dysfunction. MRI is the gold standard diagnostic method. Management includes conservative approaches such as non/reduced weight bearing with regular analgesia during pregnancy, bisphosphonate therapy postpartum and surgical interventions such as reduction and internal fixation of fracture or arthroplasty.

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109. Reduced placental stress-response gene expression in gestational diabetic pregnancies treated with medication compared to pregnancies treated with diet alone
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Abstract
Gestational diabetes mellitus (GDM) poses an immediate threat to thousands of pregnancies and affects the ongoing health of mothers and babies. GDM may be controlled with diet, but requires medication if symptoms are severe; however, what leads to severe GDM in some at-risk women but not others is unclear. The placenta is critical to maternal insulin resistance, and placental response to stress may have a role in GDM.

Aim: Determine if a placental expression of stress-response related genes is altered in GDM compared to healthy pregnancies, and is distinct between mild (diet treated) and severe (medication treated) GDM pregnancies. Placentae were collected from control (no complications), GDM diet treated (GDMD), and GDM medication treated (GDMM) pregnancies. Groups were matched for delivery mode, maternal age, maternal body mass index (BMI), infant sex (male infants), and infant weight. The expression of 239 genes was measured by quantitative polymerase chain reaction (qPCR). Fold regulation of ≥1.5 with a p-value (t-test) of ≤0.05 in any comparison (control vs. GDMD, control vs. GDMM, GDMD vs. GDMM) was considered potentially biologically meaningful. Twenty genes had potentially biologically meaningful changes. Eight genes (HSPA12A, DnjAB6, DNAJBS, GPX1, CYP4B1, GPX2, CYP2F1, XDH) were down-regulated and four genes (PTG52, PRDX6, DUSP1, VIMP) were up-regulated in GDM compared to control. Eight genes (CYP2C19, CYP2C9, HMNOX1, CADAS8, FM04, CAT, CRYAA, HSDP1) were up-regulated in GDMD but down-regulated in GDMM. Genes altered in placenta from GDM compared to control pregnancies may have roles in GDM aetiology and pathophysiology. Genes with different expressions between GDM groups (GDMD vs. GDMM) may represent a response to medication in the GDMM group. Alternatively, cellular stress may lead to an increased gene expression response to maintain cellular homeostasis in less severe GDMD that is not present in the more severe GDMM. Therefore, gene changes may represent a more successful adaptation to stress in GDMD compared to GDMMD.

110. Perinatal outcomes in women with gestational diabetes mellitus managed with diet alone versus insulin
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Abstract
Gestational diabetes mellitus (GDM) poses an immediate threat to thousands of pregnancies and affects the ongoing health of mothers and babies. GDM may be controlled with diet, but requires medication if symptoms are severe; however, what leads to severe GDM in some at-risk women but not others is unclear. The placenta is critical to maternal insulin resistance, and placental response to stress may have a role in GDM.

Aim: Determine if a placental expression of stress-response related genes is altered in GDM compared to healthy pregnancies, and is distinct between mild (diet treated) and severe (medication treated) GDM pregnancies. Placentae were collected from control (no complications), GDM diet treated (GDMD), and GDM medication treated (GDMM) pregnancies. Groups were matched for delivery mode, maternal age, maternal body mass index (BMI), infant sex (male infants), and infant weight. The expression of 239 genes was measured by quantitative polymerase chain reaction (qPCR). Fold regulation of ≥1.5 with a p-value (t-test) of ≤0.05 in any comparison (control vs. GDMD, control vs. GDMM, GDMD vs. GDMM) was considered potentially biologically meaningful. Twenty genes had potentially biologically meaningful changes. Eight genes (HSPA12A, DnjAB6, DNAJBS, GPX1, CYP4B1, GPX2, CYP2F1, XDH) were down-regulated and four genes (PTG52, PRDX6, DUSP1, VIMP) were up-regulated in GDM compared to control. Eight genes (CYP2C19, CYP2C9, HMNOX1, CADAS8, FM04, CAT, CRYAA, HSDP1) were up-regulated in GDMD but down-regulated in GDMM. Genes altered in placenta from GDM compared to control pregnancies may have roles in GDM aetiology and pathophysiology. Genes with different expressions between GDM groups (GDMD vs. GDMM) may represent a response to medication in the GDMM group. Alternatively, cellular stress may lead to an increased gene expression response to maintain cellular homeostasis in less severe GDMD that is not present in the more severe GDMM. Therefore, gene changes may represent a more successful adaptation to stress in GDMD compared to GDMMD.

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Abstract

Background: Gestational diabetes mellitus (GDM) is a major cause of adverse pregnancy and neonatal outcomes. Strict glycaemic control throughout pregnancy is an effective method to manage these adverse outcomes.

Objective: To evaluate maternal characteristics and perinatal outcomes of pregnancies affected by GDM managed with diet alone versus requiring insulin.

Methods: Retrospective analysis of women with GDM between January 2018 and December 2019 at Royal Women’s Hospital, Victoria using medical records.

Results: Over two years, 1748 women were diagnosed with GDM of whom 721 (41.25%) were managed with dietary changes alone and 1027 (58.75%) required additional insulin. Maternal age was higher in women managed with diet (35.40 years vs. 32.85 years, \(p < 0.001\)). Maternal body mass index (BMI) was higher in women requiring insulin (29.22 kg/m\(^2\) vs. 26.37 kg/m\(^2\), \(p < 0.001\)). The occurrence of pregnancy-induced hypertension, pre-eclampsia and eclampsia were similar. Women requiring insulin had higher rates of labour induction (55.0% vs. 41.2%, \(p < 0.001\)) and elective caesarean sections (26.5% vs. 20.5%, \(p = 0.014\)). However, gestational age at the time of induction was similar (38 weeks). There were no significant differences in neonatal complications (Apgar scores, birth trauma, hypoglycaemia, small for gestational age, fetal growth restriction, admission to special care nursery, mortality). However, the rate of premature births was higher in women managed by diet alone (4.0% vs. 2.1%, \(p = 0.031\)).

Conclusions: This study demonstrated rates of LGA, macrosomia, induction of labour and elective caesarean sections remained higher in women managed with insulin compared to diet alone, although no significant differences in neonatal complications were observed. Pregnancies affected by GDM remain high-risk and require prospective studies to explore further interventions to improve pregnancy and neonatal outcomes in the GDM population.

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111. Finding a way forward – Obstetrician led pathway for women with gestational diabetes

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Abstract

The model of care at Counties Manukau Diabetes in Pregnancy service is set up to offer equal access and care to women with gestational diabetes mellitus (GDM), Type 1 (T1) and Type 2 (T2) diabetes although the patient risk is variable depending on diabetes type. This model of care is not sustainable in its current form. We see an average of 1000 women every year. There is a limited number of physician full-time equivalent available to meet patient demand and a high proportion of time was spent on women with lower risk GDM. An initiative called the obstetrician led gestational diabetes management (OLGDM) pathway was launched to re-prioritise resources to cope with the increasingly overburdened Diabetes In Pregnancy (DiP) service, allowing all patients to be seen and managed in a timely manner without subjecting patients to the high probability of prolonged waiting times during clinic days, resulting from the unavoidable high patient-to-endocrinologist ratio per booked clinic session. This pathway was written so that patients receiving initial care under the obstetrician led gestational pathway would not be disadvantaged in any way and importantly, any patient who develops (or after an initial assessment, be deemed to have) an indication to move across to usual care, can be transferred across seamlessly as indicated. This was started in September 2020. Since then the demand for clinics now meets the need, there are shorter waiting times for women, physicians are able to see the higher risk women in a more timely manner and patient satisfaction with the clinic is improved. An OLGDM guideline and pathway document was written to start this process. The referrals are triaged based on this and the initial appointment is made for obstetrician only. Training, teaching and mentoring are provided to enable obstetricians and trainees to up skill in the management of gestational diabetes including starting and titrating metformin and starting insulin during pregnancy when indicated. The benefits have translated to improved confidence in obstetricians and trainee obstetricians who are then able to use this knowledge when seeing women as inpatients and in labour and post partum. With the population rates of diabetes and prediabetes in the predominantly Pacifica, Maori and Indian population in our catchment area it has become apparent that all clinicians need to feel comfortable in the management of diabetes in pregnancy rather than a select few. Novel models of care are needed to meet growing needs and this is one of them.

112. Familial hypocalciuriic hypercalcaemia in pregnancy

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Abstract

Familial hypocalciuric hypercalcaemia (FHH) is an autosomal dominant condition characterised by chronic mild hypercalcaemia in association with hypocalciuria, hypermagnesaemia, and normal to mildly elevated parathyroid hormone (PTH) levels. It is caused by a mutation in the calcium-sensing receptor (CASR) gene and tends to have familial association. The measurement of a 24-h urine calcium-to-creatinine clearance ratio (CCCR) can be used to help distinguish FHH, with confirmatory genetic testing available. Typically, patients remain asymptomatic throughout their lifetime and do not develop significant complications. There is no specific treatment for FHH. During pregnancy, the most common cause of hypercalcaemia is primary hyperparathyroidism (PHPT). It is important to recognise and identify the presence of PHPT as it can be associated with miscarriage, intrauterine growth restriction, pre-eclampsia, pancreatitis and hypercalcaemic crisis. The definitive treatment of PHPT is parathyroidectomy, which is preferentially performed in the second trimester. The assessment of hypercalcaemia during pregnancy can be complicated by physiological changes. Dilutional hypercalciuria leads to reduced total calcium levels, and ionised calcium is therefore the preferred measurement in pregnancy. Hypercalciuria is also seen in pregnancy as a result of increased intestinal calcium absorption (absorptive hypercalciuria), which makes the interpretation of urinary CCCR difficult. There are currently few case reports of FHH in pregnancy in the literature. My poster will focus on differentiating FHH and PHPT in pregnancy and examining a case series of pregnancies in Queensland women with FHH (who have had confirmatory CASR gene testing) to investigate maternal and neonatal outcomes and compare these to women with PHPT.
113. Ovarian torsion in pregnancy: A case report
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Abstract
Ovarian torsion is a rare but serious complication of pregnancy, with an incidence of approximately 1 to 5:10,000 pregnancies. Here we present a case of ovarian torsion in pregnancy in a 35-year-old multigravida who presented at 16 weeks gestation with acute onset left iliac fossa pain and 1 episode of vomiting on the background of normal dating and first-trimester screening ultrasounds with no ovarian abnormalities noted. On review, she was haemodynamically stable, not peritonitic, had a closed cervix on speculum exam, a foetal heart rate of 150 bpm, and normal blood. Transabdominal ultrasound revealed a single live pregnancy with a 12 cm left ovarian dermoid cyst with a very poor vascularity signal suggestive of ovarian torsion. She underwent an emergency laparotomy and left ovarian cystectomy with preservation of the left ovary. Histopathology confirmed a mature cystic teratoma, and tumour markers were normal. She proceeded to deliver a healthy full-term infant via elective caesarean section for breech presentation. As this case demonstrates, diagnosis of ovarian torsion can be challenging due to the non-specific clinical features, and the enlarged gravid uterus may limit ultrasound evaluation of the ovaries during obstetric ultrasounds. Ovarian torsion in pregnancy represents a surgical emergency, with prompt diagnosis and management important for maternal and fetal wellbeing, and it should be considered in the differential diagnosis of pregnant patients presenting with acute abdominal pain. Laparotomy is the most common treatment of ovarian torsion, and post-operative complications are uncommon.

114. Acute pancreatitis caused by hypertriglyceridaemia in pregnancy: A multidisciplinary approach to management
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Abstract
Background: Severe hypertriglyceridaemia in pregnancy is a rare but potentially life-threatening entity through precipitating acute pancreatitis, hyperviscosity syndrome and/or pre-eclampsia. Triglycerides and total cholesterol increase in the third trimester in response to changes in levels of oestrogen, progesterone and human placental lactogen. This can exacerbate any pre-existing abnormalities of lipid metabolism.

Case: A 31-year-old lady, G2P0, with unremarkable personal or family history, presented with acute pancreatitis at 26/40. Triglycerides were grossly elevated at 87.3 mmol (NR <2.5 mmol/l). The patient was managed with an insulin-dextrose infusion, gemfibrozil 600 mg twice a day (TGA category B3), fish oil 9 g, and a low-fat moderate carbohydrate diet sufficient for the nutritional requirements of pregnancy. She was discharged when triglyceride levels were 9 mmol/l and then monitored with weekly lipid profile and clinical review. A pre-emptive plan for plasmapheresis was developed for consideration if triglycerides again rose above 20 mmol/l. Growth scans were reassuring. Despite treatment, triglycerides rose to 14 mmol/l at 35+4/40. Induction was performed at 37+1 weeks. The baby was healthy weighing 3725 g with Apgar scores of 9, 9. Genetic test results for hypertriglyceridaemia-associated mutations are pending.

Discussion: Severe gestational hypertriglyceridaemia is associated with a significant risk of adverse fetal and maternal adverse outcomes. In this case, an insulin-dextrose infusion was effective as the mainstay of acute therapy. Dietary measures, fish oil and gemfibrozil were successful in managing the patient to term with no noted ill-effects on the fetus. Plasmapheresis is beneficial in refractory cases of hypertriglyceridaemia but was not required in our case. A multidisciplinary approach including endocrinologists, obstetricians, dieticians and haematologists assisted to achieve a successful outcome. Further research is required to determine optimal evidence-based screening, treatment and prevention. Genetic testing provides an opportunity to look for underlying defects and thus plan care for future pregnancies and screening of family members.

115. Medical management of primary hyperparathyroidism in the third trimester of pregnancy: A case report
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Abstract
Background: Primary hyperparathyroidism during pregnancy is a rare condition with increased maternal and fetal risks. We report a case diagnosed at 33 weeks gestation that was managed conservatively.

Case presentation: A 26-year-old primiparous woman was incidentally found to have a probable parathyroid adenoma on ultrasound at 33 weeks gestation, which had been performed to investigate a goitre and subclinical hyperthyroidism. She had asymptomatic hypercalcaemia, with a corrected calcium of 2.90 mmol/l (albumin 29 g/l, total calcium 2.64 mmol/l, normal range 2.15–2.65 mmol/l). Her ionised calcium and parathyroid hormone were also elevated (1.44 mmol/l (1.15–1.29 mmol/l), 14.8 pmol/l (2.0–8.5pmol/l)). She had no family history of hypercalcaemia, hyperparathyroidism or related syndromes. Medications included cholecalciferol 2000 units/day for vitamin D deficiency (49 nmol/l) and a pregnancy multivitamin. The patient was initially managed with oral hydration as an outpatient for two weeks. At 35 weeks gestation, she was admitted due to increasing fatigue, polyuria, polydipsia (>4 l/day) and persistent hypercalcaemia (corrected calcium 2.86 mmol/l). The patient was managed conservatively.

The patient was admitted due to increasing fatigue, polyuria, polydipsia (>4 l/day) and persistent hypercalcaemia (corrected calcium 2.86 mmol/l). The patient was managed conservatively.
Discussion: Primary hyperparathyroidism in pregnancy has been associated with a 3.5-fold risk of miscarriage in the first and second trimesters. Parathyroid surgery is recommended in the second trimester; there is no consensus on surgery in the third trimester. Pre-eclampsia occurs in up to 30% of medically managed cases, and severe neonatal hypocalcaemia has been reported. Our case is notable for the significant improvement in calcium following furosemide administration, a loop diuretic that inhibits renal paracellular reabsorption of calcium.

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116. Continuous glucose monitoring: A cost effective tool to reduce pre-term birth in women with type 1 diabetes.

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Abstract
Objective: To investigate the cost effectiveness of continuous glucose monitoring (CGM) when compared to self-monitoring of blood glucose (SMBG) in preventing perinatal complications in women with type 1 diabetes during pregnancy.
Methods: This retrospective matched cohort study included women with type 1 diabetes referred to a state-wide tertiary obstetric centre before and after the introduction of government-funded CGM in March 2019. Women using CGM were matched in a 1:1 ratio of various patient characteristics with a cohort of women with type 1 diabetes who exclusively used SMBG and delivered prior to March 2019. Data regarding glycaemic control during pregnancy and pregnancy outcomes was collected by auditing medical records and standardised cost data was used to quantify cost effectiveness.
Results: A total of 98 women were included in the study, 49 who self-monitored blood glucose and 49 who used CGM throughout pregnancy. We observed a significantly reduced cost of hospital stay (RR 0.600; 95% CI 0.39–0.922; p = 0.026) and very pre-term birth rates (RR-inverse 1.089; 95% CI 1.002–1.184; p = 0.041) in the CGM group. There was a significant reduction in the length of maternal antenatal inpatient hospital stay (p < 0.01) and Adult Special Care Unit stay (p = 0.013) and NICU admission (p = 0.026) in the continuous glucose monitoring group when compared to the self-monitoring group. Continuous glucose monitors represented a net cost saving to the health care sector of $12,063 per pregnancy where the device was used. When only accounting for the cost of devices, we calculated an incremental cost-effectiveness ratio of $2185 per pre-term birth prevented.
Conclusions: Continuous glucose monitor use in pregnancy is a cost-effective intervention for reducing the risk of pre-term birth in women with type 1 diabetes. As well as improving pregnancy outcomes, continuous glucose monitoring results in a net cost-benefit to the health sector when compared to self-monitoring of blood glucose.

117. Severe hyperemesis gravidarum resulting in concealed miscarriage and Wernicke’s encephalopathy

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Abstract
Wernicke’s encephalopathy (WE) is a serious neurological syndrome caused by severe thiamine (vitamin B1) deficiency. In pregnancy thiamine requirements are increased. If the pregnancy is complicated by hyperemesis gravidarum (HG), thiamine rapidly depletes. WE is a rare but known complication of severe HG and in non-alcoholic patients, the prevalence ranges from 0.04% to 0.13%. Its acute recognition and treatment are crucial to prevent long-term neurological sequelae or death. We report the case of a 36-year-old G3P at 16 + 1 weeks of gestation, who presented to emergency with intractable nausea and vomiting, decreased oral intake for 11 weeks and progressive inability to mobilise. Her presentation was complicated by a concealed miscarriage concurrent with 14 weeks gestation. Investigations showed severe micro and macro nutritional deficiencies from HG associated with 24 kg weight loss, microcytic anaemia (Hb 102 g/l, mean corpuscular volume 59 fl), hypokalaemia (2.2 mmol/l), hypercalcaemia (2.75 mmol/l corrected), hypoalbuminaemia (22 g/l), thyroid stimulating hormone <0.02 and Free T4 of 22. On assessment, she was confused and slow to respond. Examination revealed mouth ulcers and oculomotor abnormalities including nystagmus and ataxia. She was in urinary retention and suffering from severe constipation. The patient was treated symptomatically with antiemetics, intravenous fluids, thiamine, electrolyte and multi-vitamin replacement. Induction of labour for miscarriage was completed post stabilisation on day 4 of admission with mifepristone and misoprostol. An magnetic resonance imaging (MRI) brain showed type 2 (T2) hyperintensity involving periventricular aspects of the thalamus bilaterally without significant associated mass effect. She was monitored closely for refeeding syndrome and did not require total parenteral nutrition (TPN). She was managed via a multi-disciplinary team approach and remained in hospital for over three weeks and was subsequently discharged to a private hospital for ongoing rehabilitation and strengthening. This case highlights the importance of early diagnosis and treatment of WE in pregnancy and demonstrates the importance of a multi-disciplinary approach in managing such complex patients.

118. Success rates of epidural extension in emergency caesarean section at a tertiary referral hospital

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Abstract
Background: Epidural extension for caesarean section (CS) is an anaesthetic technique used at Royal Brisbane and Women’s Hospital (RBWH). We aimed to review the success rate of epidural extension for emergency CS and compare the results with a cohort audited in 2013, prior to the implementation of an institutional guideline.
Methods: Ethics exemption was obtained. Data was obtained from the Anaesthesia Benchmarking System Database and the electronic medical record. Information included: patient characteristics, mode of delivery, urgency of the CS, epidural drugs and volumes, requirement for general anaesthesia (GA) and reasons for conversion to GA. A successful epidural extension was defined as completion of caesarean section under epidural anaesthesia with no intraoperative conversion to GA. A chi-square test was used to compare success before and after the guideline.

Results: One hundred and seventy-eight women had an epidural and proceeded to Category 1 or 2 CS between July and December 2020. Their mean (SD) age was 31 (4.9) years and 154 (87%) were nulliparous. A successful epidural extension was achieved in 165 patients (92.6%). Epidural extension failed in 4 of 14 Category 1 (29%) and 9 of 164 Category 2 cases (6%). Lignocaine was the most commonly-used local anaesthetic (156, 87%), followed by ropivacaine (14, 7%). The median (IQR) volume of local anaesthetic for top-up was 20 ml (16.3–22.0). In the 2013 cohort, 132 women had an epidural inserted and 122 (92%) had successful epidural extension for CS. The median (IQR) volume of local anaesthetic used in 2013 was 15 ml (10–20). There was no significant difference between epidural extension before and after guideline implementation ($p = 0.93$).

Conclusion: Epidural extension success at RBWH has changed following the introduction of an institutional guideline, however, the median volume of local anaesthetic used has increased. Extension failure was more common in Category 1 CS.

119. Spontaneous heterotopic pregnancy with subsequent ruptured ectopic pregnancy: A case study
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Abstract
Heterotopic pregnancy is an uncommon and potentially life-threatening condition in which there is a simultaneous occurrence of intrauterine and ectopic pregnancies. It has an incidence of approximately 1:3900 pregnancies, occurring in only 1:30,000 spontaneous pregnancies. Here, we present a rare case of spontaneous heterotopic pregnancy in a 34-year-old primiparous woman who was brought in by ambulance to the emergency department following collapse at 20+1 weeks gestation after normal first-trimester screening and morphology scan. She was haemodynamically unstable and foetal heart rate was 60 bpm. Initial resuscitation included blood transfusion of 2 units packed red blood cells and 1 g of intravenous tranexamic acid. Bedside ultrasound revealed evidence of approximately 1000 ml clot in the right upper quadrant. She underwent a diagnostic laparoscopy and washout, which proceeded to a midline exploratory laparotomy. This revealed a 2.6 l haemoperitoneum and query right ectopic pregnancy with calcified areas and clot, with no other cause of bleeding identified. Right salpingectomy was performed, and pathology later confirmed ectopic pregnancy. The intrauterine pregnancy had no complications, and she delivered a healthy full-term baby. This case demonstrates that ultrasound confirmation of intrauterine pregnancy does not exclude coexisting ectopic pregnancy. Heterotopic pregnancy should be considered in any pregnant woman presenting with abdominal pain or signs of haemorrhagic shock, as prompt diagnosis and treatment are essential to minimise foetal and maternal morbidity and mortality.

Reference
1. Howie BA, Davidson IU, Tanenbaum JE, et al. Thoracic epidural abscesses: A systematic review. Global Spine J 2018; 8(4 Suppl): 685-84S. doi: 10.1177/2192568218763524. Epub 2018 Dec 13. PMID: 30574442; PMCID: PMC6295817.

120. Spinal epidural abscess in pregnancy: A case report
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Abstract
Introduction: Spinal epidural abscesses (SEA) are frequently misdiagnosed and the delays in diagnosis can result in significant morbidity and mortality. There are very few cases reported in pregnancy. We present a case of a multiparous 34-year-old woman with a complex medical and obstetric background with an SEA.

Case: A 34-year-old G6P2+1 with an obstetric history of one vaginal delivery, one elective caesarean for dichorionic diamniotic (DCDA) twins and three elective terminations presented to the Emergency Department at 30 weeks gestation with severe back pain radiating through her chest with pleuritic pain, tachycardia, fever and hypotension with an elevated white cell count (18.6 × 10^9/l) and C reactive protein (103.9 mg/l). Her medical history included previous intravenous drug use, Hepatitis C, fatty liver disease, systemic lupus erythematosus and recent methicillin-sensitive staphylococcus aureus (MSSA) infective endocarditis with cardiomyopathy. She was treated presumptively for sepsis of unknown origin and pulmonary embolism (PE) and transferred to intensive care unit. VQ scan was negative for PE. Magnetic resonance imaging (MRI) 4 days from admission showed posterior epidural abscess at T2–T4 level with moderate spinal canal stenosis, left T3–T4 facet joint effusion consistent with septic arthritis and adjacent soft tissue inflammation. Transeosophageal echo showed moderate LV dysfunction and incidental cephalic and internal jugular vein thrombus but did not demonstrate endocarditis. Microbiological investigations indicated an MSSA bacteraemia. Dental assessment demonstrated grossly carious dentition. Five teeth were extracted and she was treated with 6 weeks of IV fluoxacillin and therapeutic enoxaparin and responded well. Repeat imaging showed complete resolution of the SEA and associated septic arthritis. Elective repeat caesarean section with bilateral salpingectomy was carried out at 38+5 weeks, a male infant (2963 g, 21st percentile) was delivered. She was discharged on 6 weeks of oral fluoxacillin with infectious diseases follow-up, and on 12 weeks of therapeutic enoxaparin.

Discussion: This case emphasises the complexity of diagnosis of SEA in pregnancy particularly in women with multiple confounding medical comorbidities. Pregnancy may delay a diagnosis but the physiological changes may result in more complications than non-pregnant SEA.

Reference
1. Howie BA, Davidson IU, Tanenbaum JE, et al. Thoracic epidural abscesses: A systematic review. Global Spine J 2018; 8(4 Suppl): 685-84S. doi: 10.1177/2192568218763524. Epub 2018 Dec 13. PMID: 30574442; PMCID: PMC6295817.

121. Per rectum bleeding in third trimester: A case report on colorectal cancer in a young woman
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Abstract
Introduction: Rectal bleeding is a common presentation in pregnancy, usually related to hemorrhoids, anal fissures, or diverticulosis. However, it is important to consider other causes such as colorectal cancer. Here, we report a case of a young woman who presented with per rectum bleeding in the third trimester of pregnancy.

Case: A 31-year-old gravida 2 para 1 woman presented at 38 weeks gestation with rectal bleeding. She was otherwise asymptomatic and referred to the obstetrician for evaluation. Initial investigations, including ultrasound and magnetic resonance imaging, revealed a mass in the rectum. Colonoscopy confirmed a large rectal polyp, which was biopsied and found to be adenocarcinoma.

Discussion: This case highlights the importance of considering colorectal cancer as a cause of rectal bleeding in pregnancy. Early diagnosis and intervention are critical to ensure maternal and fetal outcomes.

Reference
1. Lai SC, Cheung AK, Law CT, et al. Per rectum bleeding in pregnancy: A systematic review. J Obstet Gynaecol Res 2019; 45(3): 483-91. doi: 10.1111/jog.13296. Epub 2019 May 21. PMID: 31153628; PMCID: PMC6594837.
Abstract

Introduction: Colorectal cancer was, in 2020, the third most prevalent cancer worldwide, the second leading cause of cancer death and accounted for 11% of cancer diagnoses and deaths in Australia. Haemorrhoidal bleeding is not uncommon in pregnancy. We present a case of a 29-year-old multiparous woman who presented at 35 + 4 weeks gestation with rectal bleeding.

Case: A 29-year-old female in her third trimester presented with 4 months of worsening rectal bleeding on a background of 8 years of intermittent bleeding associated with haemorrhoids. She was otherwise fit. She had been scheduled for a colonoscopy which was delayed due to pregnancy. She presented to the Emergency Department three times in two weeks with worsening rectal bleeding. She was admitted on her third presentation with a haemoglobin of 98 g/l, no bowel motion for 6 days and 3 kg weight loss in 1 month. The decision for delivery by caesarean section was made due to persistent bleeding necessitating transfusion. A male infant was delivered at 36 + 5 in good condition. An intraoperative flexible sigmoidoscopy demonstrated a rectal mass 8 cm from the anorectal line which was biopsied. The patient showed no clinical signs of bowel obstruction immediately postpartum. A postpartum showed a 14 cm segment of sigmoidorectal intussusception with upstream large bowel dilatation and focal soft tissue thickening within the rectum without evidence of metastatic disease. She underwent an open high anterior resection. Histopathological examination of the 34 cm specimen confirmed moderately differentiated adenocarcinoma of the sigmoid colon. The immediate postoperative recovery period was uncomplicated and the patient was discharged home 5 days following anterior resection. A follow-up genetic assessment was undertaken and testing for hereditary forms of colorectal cancer is underway.

Discussion: This case highlights the potential difficulties in diagnosis and investigation of colorectal cancer in pregnancy. It is pertinent that recurrent presentations and red flag symptoms not be ignored and that a multidisciplinary approach be utilised to appropriately investigate and manage these women.

References
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2. Cancer data in Australia. Australian Institute of Health and Welfare, Australian Government. https://www.aihw.gov.au/reports/cancer/cancer-data-in-australia/contents/summary (accessed 28 April 2021).

122. Pregnancy outcome in a primiparous woman with a single kidney and advanced chronic kidney disease – A rare case report

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Abstract

Pregnancy in women with chronic kidney disease (CKD) continues to present a challenging clinical scenario. Over the past decade, there has been a substantial increase in data published, which has influenced the approach and management of CKD in pregnancy. However, pregnancy outcomes in women with a solitary kidney remain an under-researched phenomenon due to a scarcity of cases. Most of our knowledge stems from studies of living kidney donors, a group biased by strict selection criteria. Therefore, pregnancy outcomes in women with CKD and a solitary kidney remain an enigma, as the rarity of this unique clinical scenario has limited the opportunity for further research. We report a case of successful pregnancy outcome in a 30-year-old primiparous woman, with stage 3b CKD, on a background of a solitary kidney, with previous pelvic–ureteric junction obstruction requiring pyeloplasty at the age of 15. Despite the absence of hypertension and minimal proteinuria, her risk of maternal and foetal complications was assessed as high, given her estimated Glomerular Filtration Rate (eGFR) of 31 to 37 ml/min (creatinine 160–180 μmol/l) pre-conception. Her pregnancy was complicated by significant pelvicalyceal system dilatation, which exceeded the accepted physiological changes in pregnancy, and generated concern for obstruction and the need for stent or nephrostomy insertion. Her right kidney measured 26 cm longitudinally with an AP pelvis measurement of 6.6 cm. Her creatinine, which had increased to 180–200 μmol/l in her second trimester, remained stable, suggesting that her solitary kidney was not functionally obstructed. She was, therefore, able to be managed conservatively, with regular surveillance imaging and blood tests, and invasive intervention was avoided. Both her imaging and blood tests remained stable during her pregnancy and she delivered at 36 weeks’ gestation without complications. Post-partum, her hydronephrosis improved significantly with repeat imaging showing a reduction in the size of her kidney to 12 cm. Her creatinine remained stable between 160 and 190 μmol/l. This case report not only adds invaluable data to the scarce CKD-pregnancy literature but also highlights the rare underlying pathophysiology and its impact on antenatal management and outcomes in this high-risk population.

123. An audit of the early pregnancy assessment service (EPAS): A retrospective cohort study

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Abstract

Introduction: Miscarriage (pregnancy loss prior to the 20th-week gestation) can affect up to 20% of all pregnancies. Current clinical practice streamlines early pregnancy assessment via an early pregnancy assessment service (EPAS). We conducted a retrospective study to assess the outcomes of this clinic.

Method: All women seen over a 1 year period (1 January 2018–31 December 2018) in the EPAS clinic at Liverpool Hospital were included in the study. Data was extracted from the electronic medical record and paper records of the clinic. Data collected included demographic data, background medical and pregnancy information, treatment undertaken, presentations to emergency department, units of blood administered and outcome of the EPAS assessment. Data was analyzed using SPSSv 26, and significance set at p < 0.05.

Results: A total of 966 women were assessed at an average of 9 (8–11) weeks gestation, were 32.2 (28.9–37.9) years of age, with 40.7% of women born overseas and 25.7% from culturally and linguistically diverse population. Women presenting for their third or more miscarriage accounted for 13.4% of EPAS presentations and occurred more likely in older women likelihood ratio 1.07 (1.04–1.1) and women that had undergone a previous cesarean section. Of all EPAS presentations 63% miscarried, 30% were found to have a continuing viable pregnancy, 4.3% had an ectopic and 0.9% had a molar pregnancy diagnosis. Of all miscarriages 55% (n = 331) were managed conservatively, 17.4% (n = 104) had a medical management and 25.3% (n = 151) required surgical treatment. Medical management was successful in 72.3% of women and conservative in 92.3% of episodes.

Conclusion: Treatment via EPAS is effective but requires significant time for assessment and follow-up visits. Women with recurrent miscarriages may need an improved referral for follow-up and assessment.
Abstract

**Introduction:** Australia and New Zealand (NZ) have maintained different oral glucose tolerance test (OGTT) cut-offs to diagnose gestational diabetes mellitus (GDM). We wanted to determine whether there were different pregnancy outcomes between Liverpool Hospital (LH) in Australia and Waikato Hospital (WH) in NZ depending on whether they met the NZ GDM OGTT diagnostic criteria (NZGDM).

**Method:** NZGDM has higher OGTT criteria with fasting \( \geq 5.5 \text{ mmol/l} \), 2-h \( \geq 8.0 \) and \( \geq 8.5 \text{ mmol/l} \). Two groups from LH were defined as NZGDM OGTT positive or negative. We devised a composite outcome of macrosomia, perinatal death, postterm delivery, neonatal hypoglycaemia and phototherapy.

**Results:** There were 7518 pregnancies.

**Conclusions:** Women who were NZGDM negative had less pregnancy complications than NZGDM positive women. Women at Liverpool Hospital had less pregnancy complications than women at WH in spite of comparable HbA1c in the third trimester.
Obstetric Medicine, Nephrology and Haematology was that of an active and progressive thrombotic microangiopathy with a severe acute kidney injury consistent with aHUS, presumably triggered by haemolysis, elevated liver enzymes and low platelet count (HELLP) or acute fatty liver of pregnancy. Eculizumab was commenced following PBS approval. A renal biopsy performed to further evaluate underlying aetiology demonstrated an eosinophilic acute interstitial nephritis (AIN). This was thought to be a drug-induced phenomenon, potentially from antibiotic or non-steroidal anti-inflammatory use in the peripartum period. A short course of prednisolone was given for AIN and eculizumab was ceased after the first dose. The patient’s renal and haematological parameters improved following temporary renal replacement therapy on day 6 postpartum and she was discharged on day 17 of admission. We present this diagnostic dilemma to encourage physicians to consider a renal biopsy in women with suspected aHUS and to consider medication-induced acute kidney injury given the frequency of antibiotic and non-steroidal anti-inflammatory drug use in the postpartum setting.

126. Audit of an obstetric medicine unit: Presenting the case mix of inpatient presentations
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Abstract
Background: Obstetric Medicine is an evolving speciality and provides physician-led input to a growing number of women with medical disorders in pregnancy. The Obstetric Medicine service at the Royal Brisbane and Women’s Hospital has expanded in recent years to include an obstetric medicine inpatient unit in 2017. To date, there are no studies describing the range of presentations to an obstetric medicine inpatient service.
Aim: To report on the indications for inpatient referral to the Obstetric Medicine inpatient service over a 12-month period at a tertiary teaching hospital.
Methodology: A retrospective audit of all women admitted to the obstetric medicine inpatient unit or referred to the obstetric medicine team’s consultation service at the Royal Brisbane and Women’s Hospital between October 2017 and October 2018.
Results: The obstetric medicine team reviewed 553 presentations in 430 women. A total of 427 initial reviews were provided as a consultative service and 126 reviews were patient admissions to the obstetric medicine inpatient unit. The most frequent reasons for obstetric medicine team referral included gestational diabetes mellitus (125/553, 22.6%), pre-eclampsia (101/553, 18.3%) and cardiovascular issues (81/553, 14.6%). Ninety-one re-admissions required obstetric medicine review. Hypertensive disorders of pregnancy 24/91 (26.0%), cardiovascular pathology 18/91 (20.0%) and neurological diagnoses 11/91 (12.0%) were the most common obstetric medicine issues on re-admission.
Conclusion: This audit provides data regarding the inpatient case mix for an obstetric medicine service in an Australian tertiary hospital.

127. Interactive blood glucose management platform for women with gestational diabetes: A pilot study
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Abstract
Background: Gestational diabetes mellitus (GDM) affects 12% to 14% of pregnancies in Australia.1 The associated excess risk for mother and baby can be attenuated with close monitoring and tight glycaemic control, however, comes at a cost of significant treatment burden for the woman and the healthcare system.2–4 Innovative care models are needed.
Aims: To determine the feasibility, safety, user satisfaction and impact on resource utilisation of a smartphone-based, remote blood glucose level (BGL) monitoring platform in women with GDM compared with a historical control group treated using the standard model of care.
Methods: This pre–post intervention study prospectively enrolled women with GDM diagnosed between 24 and 30 weeks gestation to the use of a smartphone-based GBL management platform and compared them to a historical control group of women diagnosed with GDM prior to the introduction of the application. The NET-Health smartphone app allowed automatic, real-time upload of BGLs to a central secure server where NET Health software scanned the number and value of levels to determine if they were outside a prespecified range. If identified, an automatic email notification was sent to the healthcare provider for action. Demographic data was collected at the time of enrollment. Occasions of service (OOS) and maternal and neonatal outcomes were recorded for comparison to previously collected historical data. Women completed a semi-quantitative validated satisfaction questionnaire post-delivery.
Results: A total of 192 women were included – 98 prospectively enrolled and 94 in the historical control group. The groups were well matched with no significant differences at enrollment apart from a higher number of women with a pre-pregnancy body mass index (BMI) >30 in the intervention group. There were no significant differences in maternal or neonatal clinical outcomes. Intervention with the NET-Health application reduced resource utilisation, with 1.9 fewer OOS and 37 fewer minutes of clinician time which equated to $6800 saved per hundred women (based on clinician time only). Trends toward longer gestation, more elective and fewer emergency caesarean sections with fewer neonatal complications and neonatal intensive care admissions were seen in the intervention group. A total of 51 women (53%) answered the survey with high satisfaction across all questions asked (median score either 4–5/5).
Conclusions: The use of a smartphone-based, remote BGL monitoring platform in women with GDM is feasible, safe, has a high rate of patient satisfaction and results in a reduction in resource utilisation without compromising outcomes. Further studies involving larger numbers are needed.
128. The impact of COVID-19 on diet and lifestyle behaviours for pregnant women with diabetes

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Abstract

Background/aims: Many women do not meet nutritional guidelines for pregnancy, including women with diabetes in pregnancy. During COVID-19 lockdown restrictions in New Zealand, women faced significant external stressors and lifestyle changes: such as food availability, reduced physical activity, and financial uncertainty. We were concerned that nutrition may have been further compromised by these restrictions. A self-reported online survey was performed to investigate the immediate effect of COVID-19 lockdown restrictions on dietary intake and lifestyle behaviours among pregnant women with diabetes.

Subjects/methods: The survey was sent to 82 pregnant women who had Type 1, Type 2, or gestational diabetes, and attended the Diabetes in Pregnancy Clinic in Wellington, New Zealand in May 2020, while the most restrictive COVID-19 measures were in place. All women received standard pregnancy nutrition advice provided by a dietitian and monitored blood glucose levels during pregnancy and childhood adiposity in the hyperglycaemia and adverse pregnancy outcome follow-up study. Diabetologia 2019; 62: 598–610.4. Crowther CA, Hiller JE, Moss JR, et al. Australian carbohydrate intolerance study in pregnant women (ACHOIS) trial group. N Engl J Med 2005; 352(24): 2477–2486.

Results: Fifty women (61%) responded to the survey. There was no evidence of differences in dietary intake during, compared to before the restrictions, for most food items. There was evidence women consumed more bread OR (95% CI): 0.39 (0.18–0.83) p = 0.02; less battered fish: 3.11 (1.20–8.05) p = 0.02; and less hot chips/fries: 6.32 (2.67–14.93) p < 0.0001, during the restrictions. During lockdown women consumed more meals at home: 0.05 (0.14–0.15) p < 0.0001; less takeaways: 3.63 (1.54–7.34) p = 0.003; and less restaurant and cafe meals: 15.05 (6.03–37.59) p < 0.0001, when the services reopened.

Conclusions: The nutrition of pregnant women with diabetes was not compromised during a brief COVID-19 lockdown restriction. This finding is reassuring, with countries worldwide adopting brief intermittent lockdown periods to restrict the spread of the COVID-19 virus. See published full Journal Article DOI: https://doi.org/10.1016/j.clnesp.2021.07.011

I29. Examining maternal attitudes towards medicines for treating severe nausea and vomiting of pregnancy or hyperemesis gravidarum: An Australian consumer survey

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Abstract

Background: Few studies have examined critical factors involved in decision making regarding the treatment of severe nausea and vomiting of pregnancy (NVP) or hyperemesis gravidarum (HG).

Methods: Online, national survey of Australian women who are currently or have previously experienced severe NVP or HG distributed through the HG consumer group, Hyperemesis Australia, between July and September 2020. We asked women about the use of information sources and their perceived helpfulness, attitudes towards medicines use during pregnancy, as well as perceived safety of treatments to the mother and baby.

Results: A total of 326 responses were received. The most common information sources included General Physician’s (83%), Obstetrician/Gynaecologist (65%), midwives (56%), Emergency Department doctors (55%), internet (47%), social media (43%) and community pharmacists (42%). The mean number of information sources used was 6 (range 1–16). Information sources rated as being the most helpful included Specialist doctors (e.g. Obstetric Medicine), Obstetrician/Gynaecologist, social media and blogs, while the least helpful included community pharmacists, naturopaths, and family/friends. Positive attitudes towards taking medicines and getting better rather than exposing the fetus to untreated illness were more common among those who reported seeking information from social media (87% vs. 69%) or a specialist (87% vs. 73%). Notably, women were more likely to report choosing information from a community pharmacist (16% vs. 8%). Maternal attitudes towards medicines correlated with perceptions of safety. That is, women who reported attitudes towards avoiding or using less medicines than needed during pregnancy perceived treatments as being riskier.

Conclusions: The study findings demonstrate that women use a variety of information sources to support decision making regarding the treatment of NVP/HG and that a clear relationship exists between attitudes towards medicine use in pregnancy, the perceived safety of medicines, and the use of information sources.
130. Case report: Intrauterine fetal death of fetus with congenital Dandy–Walker malformation secondary to the teratogenic effects of warfarin exposure in the first trimester

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Abstract

Introduction: Warfarin exposure exhibits teratogenic effects most during 6 to 12 weeks of gestation. Dandy–Walker Malformation is a rare central nervous system (CNS) complication of a fetus exposed to warfarin in the first trimester. It has scarcely been reported in the literature, overshadowed by the more common warfarin embryopathy of bone and cartilage in the first trimester or the CNS effects of exposure in later trimesters as a result of foetal haemorrhages.

Case presentation: This case describes a 36-year-old multigravida woman of Cook Islander origin with five previous spontaneous vaginal deliveries who had an unplanned pregnancy, incidentally detected at 11 + 5 weeks of gestation on pelvic ultrasound. She has a significant cardiac history – rheumatic heart disease with mechanical aortic valve replacement, mitral valve repair and tricuspid valve annuloplasty – which she is on lifelong warfarin therapy. She previously had suffered a right middle cerebral artery infarct in the setting of ceasing anticoagulation for an elective haemorrhoidectomy. The morphology scan detected severe hydrocephalus, and a subsequent tertiary morphology scan at 23 + 1 weeks of gestation diagnosed the foetus with Dandy–Walker malformation with associated severe hydrocephalus and secondary perforation across the anterior midline. Foetal demise was confirmed on ultrasound scan at 31 + 1 weeks of gestation with suspected foetal haemorrhages. The woman was transferred to a tertiary hospital for delivery and anticoagulation management during planned induction of labour under Maternal Foetal Medicine with cardiology input.

Conclusion: This case report provides evidence that warfarin exposure in the first trimester has a direct teratogenic effect on CNS morphogenesis, and can result in Dandy–Walker malformation. This case demonstrates that pregnant women with significant cardiac history of therapeutic anticoagulation require a meticulous and multidisciplinary approach to therapeutic anticoagulation management at preconception, during pregnancy, intrapartum and post-partum to ensure effects on mother and foetus are recognised and minimised.

131. Severe physiological hyperventilation in pregnancy

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Abstract

Introduction: Physiological hyperventilation and dyspnoea in pregnancy are well-established and mild dyspnoea begins in the first or second trimester. We report the case of a 35-year-old female with severe physiological hyperventilation of pregnancy from 18 weeks’ gestation until delivery.

Case: A 35-year-old (G4P3) presented at 18 weeks’ gestation with profound dyspnoea, presyncpe, upper limb paraesthesia and limited exercise tolerance to 20 m. Examination revealed tachypnoea at 24 breaths per minute, increased work of breathing and ability to speak in short sentences. Oxygen saturations were 100% on room air, blood pressure was 116/66 mmHg and pulse rate 80 beats per minute. Arterial blood gas demonstrated a chronic respiratory alkalosis with partial metabolic compensation. Extensive brain, cardiac and pulmonary investigations were unremarkable.

Discussion: Hyperventilation and dyspnoea occur during pregnancy secondary to physiological adaptations. The respiratory rate increases approximately 40% towards the end of the third trimester. Importantly, this increase is associated with a higher tidal volume, while respiratory rate remains unchanged. Our patient had a persistent and sustained tachypnoea ranging from 22 to 26 breaths per minute from 18 weeks’ gestation to term. Progesterone-induced hyperventilation is considered a key driver in increasing ventilation during pregnancy to meet metabolic demands. Progesterone increases the sensitivity of the respiratory centre to carbon dioxide via an oestrogen-dependent progesterone-receptor mediated facilitation of central neural mechanisms, independent of hydrogen and the respiratory chemoreflexes. Hyperventilation with respiratory alkalosis is secondary to more complex interactions than simply hormonal-induced changes in the setting of a complex interplay between acid-base balance, wakefulness drives breathe, increased metabolism and decreased cerebral blood flow. This in combination with this case demonstrates while there have been advances in the understanding of respiratory adaptations in pregnancy, the complete underlying pathophysiology is not entirely clear.

Conclusion: This case highlights a rare case of severe tachypnoea and dyspnoea secondary to exaggerated physiological hyperventilation in pregnancy. Since physiological dyspnoea in pregnancy remains a diagnosis of exclusion, it remains vital to ensure underlying pathological dyspnoea is excluded.

132. Women with gestational diabetes mellitus and neonatal outcomes at the Northern Beaches Hospital after one year of operation

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Abstract

Background: Good control of maternal hyperglycaemia in gestational diabetes mellitus (GDM) is associated with improved neonatal outcomes. Amongst the logistical challenges of opening a new large public hospital, it is important to ensure that patient outcomes are maintained at a high standard.

Aims: To compare the demographics and neonatal outcomes of women and babies with GDM seen at Northern Beaches Hospital (NBH) in its first year of operation (2019) with those seen at Manly Hospital in 2015 and 2012.

Methods: A retrospective audit was conducted of all women presenting to NBH with GDM in 2019 and compared to previously available data from Manly Hospital. Data were compared with unpaired t- and X²-tests.

Results: A total of 135 women were treated for GDM at NBH in 2019 compared to 160 at Manly in 2015 and 109 in 2012. The characteristics of the women treated were not significantly different, and the proportion treated with insulin was not different. Timing and mode of delivery, as well as rates of macrosomia and shoulder dystocia, were not significantly different in 2019, but there was a significant increase in rate of neonatal respiratory distress (21% in 2019 vs. 13% in 2015), hypoglycaemia (30% in 2019 vs. 5% in 2015) and jaundice (12% in 2019 vs. 3.5% in 2015). Antenatal expression of breast milk, a new intervention introduced in 2015 which was correlated with reduced rates of neonatal hypoglycaemia, was not performed at the same rate at NBH (43% in 2019 vs. 85% in 2015).
Conclusion: Short-term morbidity for infants of mothers treated for GDM at NBH has increased compared to those treated at Manly Hospital. We have re-invigorated our focus on educating and assisting women with an antenatal expression of breastfeeding, and we closely examine how trends improve now the hospital is more well established.

133. Gestational diabetes mellitus is associated with changes in the microRNA expression in extracellular vesicles and potential role of miR-92a-3p in skeletal muscle insulin sensitivity
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Abstract
Extracellular vesicles (EVs) play important roles in cell communication in physiological and pathological contexts. The aim of this study was to identify the role of circulating small EVs (sEVs) in the regulation of maternal insulin sensitivity in gestational diabetes mellitus (GDM). sEVs were isolated from maternal plasma obtained at early, mid and late gestation (GDM = 8, normal glucose tolerant (NGT) = 14) and a panel of miRNAs was quantified by real-time polymerase chain reaction (RT-PCR). The potential targets of the miRNAs were identified and their effect on skeletal muscle insulin sensitivity was analyzed by glucose uptake assay. We identified that six miRNAs namely miR-16-2-3p, miR-16-5p, miR-1910-5p, miR-423-5p, miR-92a-3p, and miR-92b-3p were differentially expressed in GDM compared to NGT pregnancies. On bioinformatic analysis, these miRNAs were targeting the pathways associated with glucose homeostasis, particularly, the insulin response and Janus kinase (JAK)/signal transducer and activator of transcription (STAT) pathway. We analyzed the specific pattern of expression of these miRNAs across gestation. Interestingly, miR-92a-3p expression was higher in GDM than NGT in the second trimester, whereas in the third trimester its expression is lower in GDM than NGT. Using a PCR array, we identified that miR-92a-3p induces the expression of suppressor of cytokine signaling-2 and suppresses the expression of nitric oxide synthase-2 in the JAK/STAT signaling pathway in skeletal muscle cells. Also, in the glucose uptake assay, miR-92a-3p increased the insulin-stimulated glucose uptake compared to negative miRNA in primary skeletal muscle cells. Together, the pattern of expression of miR-92a-3p in circulating sEVs in GDM and its impact on skeletal muscle insulin response indicate a protective mechanism of this miRNA to reduce the hyperglycemia in GDM. This study shows that sEV-associated miRNAs may contribute to the pathophysiology of insulin resistance and maternal metabolic changes in GDM. Finally, we identify that miR-92a-3p in circulating EVs in GDM can target JAK/STAT signaling and regulate insulin sensitivity in skeletal muscle cells.

134. Insulin wastage in GDM – Is sustainability a pipe dream?
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Abstract
Introduction: Gestational diabetes mellitus (GDM) management continues to evolve; however few studies have evaluated drug utilisation to improve sustainability. We aimed to determine the total requirement of women who commenced on isophane insulin, to reduce resource wastage in the GDM setting.
Method: We conducted a retrospective antenatal audit of women diagnosed with GDM at Mater Mothers’ Hospital, Brisbane between 1 January 2018 and 1 October 2020 and prescribed isophane insulin (Protophane®). Mater Mothers’ Hospital is a large quaternary centre servicing a culturally diverse community. Antenatal records were reviewed to determine their actual insulin usage. Those diagnosed prior to week 24 were grouped separately to reduce confounding. The primary outcome was the average insulin requirement at term compared with insulin supplied.
Results: For 1981 identified women, 604 met the inclusion criteria. Of this group, 86 women were excluded due to incomplete records: interhospital transfer or moving interstate. The remaining 518 women were stratified, with the 386 diagnosed at/post-week 24 having a mean insulin requirement at term of 26iu daily (median 22iu) versus 132 women pre-week 24 with a mean final insulin requirement at term of 40iu daily (median 34iu). An isophane insulin requirement of 45iu was found to service the needs of 88% of the GDM population requiring isophane insulin. The outpatient supply of insulin was largely serviced by community providers with only 16% having their prescription filled onsite.
Conclusion: Our results strongly indicate that the current practice of supplying 5 × 5 pens of isophane insulin (current pharmaceutical benefits scheme (PBS) maximum supply) is a gross patient oversupply. Supplying patients with 3 × 5 pens would meet the majority of insulin needs and greatly reduce the cost burden to the PBS, with an estimated national savings of $812,736 based on Australian Bureau of Statistics data. We plan to pilot a programme of staged dispensing to address this issue, reducing the pharmaceutical footprint of GDM management.
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