Pregnancy and outcomes in women with an autoimmune disease: A five year review
COOK C-M and PEEK MJ
The aim of this review was to examine the pregnancies and their outcomes in women with an autoimmune disease at Nepean Hospital over the past 5 years and to compare these to the non-autoimmune women.

To achieve this, a retrospective review of the Obstetric Database of all births from 1998 to 2002 (inclusive) was performed. Comparisons included medical conditions, medications during pregnancy and pregnancy outcomes. Sub analyses were used to explore differences in the various autoimmune disease groups and also medication regimes in all women.

There were a total of 16617 births with 166 births to women with an autoimmune disease. There was a significantly higher incidence in autoimmune women compared to nonautoimmune women of cardiac (15 vs 4%; \(P < 0.001\)), valvular (4 vs 0.5%; \(P < 0.001\)), renal (25 vs 12%; \(P < 0.001\)), haematological (17 vs 8%; \(P < 0.001\)), respiratory (27 vs 19%; \(P = 0.019\)), skin (17 vs 10%; \(P = 0.006\)), endocrine (12 vs 5%; \(P < 0.001\)) and hypertensive (27 vs 10%; \(P < 0.001\)) disorders. The major measure of pregnancy outcome was the stillbirth rate which was significantly higher \((P = 0.039)\) in the autoimmune women (2.4%) than in the nonautoimmune women (0.9%).

This review confirms the high-risk status of pregnant women with an autoimmune disease and will be the basis for future prospective studies directed at those factors that can be modified.

Outcome in pregnancies affected by severe acute respiratory syndrome
MAXWELL C, HONG SF and SERMER M
The recent worldwide outbreak of severe acute respiratory syndrome (SARS) has been implicated in the development of a life-threatening, atypical pneumonia in humans. Several cases have been reported in pregnant women in Hong Kong, and isolated cases have been reported in Singapore and Canada. Recent microbiological evidence points to a novel coronavirus that is spread via contact or droplet transmission. Limited data are available regarding the epidemiology and natural history of this disease, and there is no published information regarding the outcomes associated with pregnancy. Given the apparent virulence of the SARS organism and the decrease in cell-mediated immunity associated with pregnancy, disease progression in pregnant women may be comparable to the more severe types of viral pneumonia that result in high maternal and perinatal morbidity and mortality rates. Given the significant maternal and perinatal morbidity and mortality of viral pneumonia in pregnancy, SARS may impose greater risk in pregnant compared to non-pregnant individuals. Caring for SARS-affected pregnant women also poses several questions regarding labour and delivery management, as well as the protection of health care providers. We report outcomes of 10 women diagnosed with SARS during pregnancy from collaborating centres in Canada and Hong Kong. The clinical presentation of SARS in pregnant women is described. Fifty percent of pregnant women with SARS required intubation. Thirty percent of patients were delivered preterm. The rate of Caesarean section was 60%. Three maternal deaths were reported. We also describe our centre’s approach to labour and delivery suite organisation in view of caring for SARS-exposed and affected pregnant individuals, as well as the management of exposed neonates.

Pregnancy complicated by heart disease: A review of contemporary Canadian experience
SERMER M, COLMAN J and SIU SS
The physiologic adaptations to pregnancy can potentially worsen the prognosis in women whose pregnancy is complicated by heart disease. A comprehensive systematic approach to risk identification is desirable. The ability to predict a subgroup of women that are at a particularly increased risk of pregnancy-related complications can enhance the obstetric care we provide to this population.

A retrospective review of 276 pregnancies associated with pre-existing heart disease was undertaken in three Toronto teaching institutions. During the course of the pregnancy, 45 (18%) out of 252 completed gestations were complicated by adverse cardiovascular events (congestive heart failure, arrhythmia, and stroke). Poor maternal functional class or cyanosis, myocardial dysfunction, left heart obstruction, prior arrhythmia, and prior cardiac events were predictive of maternal cardiac complications. These prior predictors were converted into a point score. If a point score was 0, 1, or more than 1, the risk of a patient developing an adverse cardiac event, was 5, 27, and 75%, respectively. The Canadian Prospective Multicentre Study allowed validation and simplification of this prediction rule. In this study, 13 centres prospectively recruited 599 patients with
completed gestations. Similar factors were identified that predicted adverse cardiac events. In addition neonatal complications (20% of pregnancies) were associated with poor functional class or cyanosis, left heart obstruction, anticoagulation, smoking, and multiple gestation. A sample of this prospective cohort (302 pregnancies) was compared to 572 matched pregnancies with no underlying heart disease. The neonatal complication rate was higher in the study group when compared to controls, 18 versus 7%, respectively. The highest neonatal complication rate (33%) was seen in gravidas with underlying heart disease, who had previously identified cardiac risk factors, who were at both extremes of reproductive age, who had obstetrical risk factors, who smoked, or who received anticoagulants.

Both maternal and neonatal morbidity is significantly increased in gravidas with pre-existing heart disease, although mortality is low. Factors that place the mother and the neonate at risk can be identified prior to pregnancy. This allows informed counselling and development of patient-specific management plan.

Cardiac disease in pregnancy – Indian experience
Bhatla N, Lal S, Behera G, Kriplani A, Mittal S, Kumar S, Mukhopadhyay A, Agarwal N, Yadav R and Talwar KK
To evaluate the maternal and fetal outcome of pregnancies complicated by cardiac disease in a developing country, a retrospective analysis was carried out of 207 pregnancies in women with cardiac disease who delivered at ≥28 weeks of gestation from June 1994 to December 2000 at a tertiary care centre.

Rheumatic heart disease (n = 183, 88%) with isolated mitral stenosis (n = 71) was the predominant cardiac problem. Septal defects were the most common form of congenital heart disease (n = 24). In 28 (13.52%) women, the diagnosis of cardiac disease was made during pregnancy. Cardiac complications were noted in 62 (29.95%) and fetal complications in 42 (20.28%) pregnancies. Patients in New York Heart Association (NYHA) class I-II (n = 175, 84.54%) had fewer maternal complications and their babies had a higher birthweight than those in NYHA class III-IV (n = 32, 15.43%). Cardiac intervention was performed prior to pregnancy in 111 (60.65%) patients with rheumatic heart disease: PTMC/CMV in 73 and valve replacement (VR) in 38. Maternal and fetal outcome was better in patients with prosthetic valves (n = 38) and the majority (97.4%) of them remained in NYHA class I-II. Cardiac intervention was safely carried out during pregnancy in 10 women (PTMC in seven, CMV in one, and VR in two). One of them developed congestive cardiac failure during labour. None of the newborns of the 41 women who had received anticoagulants had any congenital malformation.

Rheumatic heart disease was the predominant type. Patients in NYHA class I-II had a better maternal and fetal outcome than those in NYHA class III-IV. Surgical correction of the cardiac lesion prior to pregnancy was associated with better pregnancy outcome. Pregnant women with prosthetic valves tolerated pregnancy well.

The CHIPS pilot trial (Control of Hypertension In Pregnancy Study) [Work in Progress]
Côté AM
The CHIPS Trial will determine if ‘less tight’ (vs ‘tight’) control of mild-moderate non-proteinuric hypertension in pregnancy will decrease adverse perinatal outcome without increasing maternal risk. First, the CHIPS Pilot Trial will determine compliance with the trial intervention of differential BP control.

The CHIPS Pilot will recruit 132 women (66 per arm) internationally over 1 year. Inclusion: dBP 90–109 mmHg due to pre-existing or gestational hypertension; live fetus(es); and 20–33+6 week. Exclusion: Severe hypertension; proteinuria; contraindication to either arm or to pregnancy prolongation; or known major fetal anomaly.

Treatment: Randomisation to either ‘less tight’ control (target dBP 100 ± 5 mmHg) or ‘tight’ control (target dBP 85 ± 5 mmHg) of BP.

Interventions: ‘Less tight’ control: BP therapy stopped/decreased if dBP < 95 mmHg; and started/increased if dBP > 105 mmHg. If dBP 95–105 mmHg, no change. ‘Tight’ control: BP therapy stopped/decreased if dBP < 80 mmHg, and started/increased if dBP > 90 mmHg. If dBP 80–90 mmHg, no change. Both groups: Labetalol preferred. Otherwise, usual care. Data will be collected on obstetric complications.

Outcomes: Primary: Mean dBP at 28, 32 and 36 weeks. Secondary: Clinician compliance with interventions; women’s satisfaction with care. Other: Outcomes for main CHIPS, including serious perinatal complications or birthweight <3rd percentile (primary); serious maternal complications (secondary).

Follow-up: Standardised BP measurement. dBP and BP therapy will be recorded in a patient-held diary. At 28, 32, and 36 weeks, the trial co-ordinator will meet with women to review the diary and BP management, and have dBP measured independently. Other outcomes will be assessed during delivery admission when women will complete a questionnaire about their views.

CIHR funded. Recruitment from Apr/03. Interested centres should contact L Magee (LMagee@cw.bc.ca) for CHIPS Study Group.

Maternal pulse pressure in severe early onset pre-eclampsia
Steyn W
Assessment and management of hypertension in pregnancy depend on systolic blood pressure (SBP) and diastolic blood pressure (DBP). Relatively little has been published about pulse pressure. We assessed the characteristics of maternal pulse pressure (PP) in severe early onset pre-eclampsia (PE).

Blood pressure in mothers with severe PE before 34 weeks’ gestation who were managed expectantly was also measured every 30 min on alternative days with the pregnancy validated Spacelabs 90207 ambulatory monitor. These results were not available to managing clinicians. Women were managed according to departmental policy.

The mean PP of 19196 measurements obtained from 87 women was 52.1 ± 11.1 mmHg. The PP correlated significantly with the SBP (r = 0.894; P < 0.001), the DBP (r = −0.116, P < 0.001) and the mean arterial pressure (MAP) (r = 0.165, P < 0.001). This correlation between PP and SBP remained significant for all PP values. The correlation between PP and DBP was not significant when only the upper quartile of PP was considered. PP was also significantly influenced by parity (multipara = 50.6 mmHg; primipara = 47.8 mmHg, P < 0.001), medication used and gestational age (GA) (GA 28–31 weeks = 53.7 mmHg; GA 32–34 weeks = 52.6 mmHg, P < 0.001). The
mean PP was higher at night (55.1 ± 2.0 vs 52.9 ± 11.0; P < 0.001). Mean SBP and mean MAP were significantly higher in the upper quartile of PP compared with the lower quartile (148.7 vs 127.3 mmHg and 106.3 vs 101.3 mmHg, respectively), while DBP decreased (82.5 mmHg vs 87.5 mmHg).

Pulse pressure changes in women with severe pre-eclampsia are compatible with increased arterial stiffness and seem to be influenced more by SBP than DBP. The implications of these findings should be further investigated.

Two step screening for pre-eclampsia and fetal growth restriction
BARKEHALL-THOMAS A, WILSON C, BAKER L, NI BHUINNEAN M and WALLACE EM

Objectives: Both elevated mid-trimester maternal serum hCG and abnormal uterine artery Doppler flow velocity waveforms have been associated with adverse pregnancy outcomes but neither test has been demonstrated to have adequate utility as a predictive marker. We set out to assess the predictive capacity of a two step screening process.

Methods: In our institution women with an unexplained elevated mid-trimester hCG level (≥ 4.0 MoM) are offered uterine artery Doppler assessment at 22–24 weeks’ gestation. We have audited the utility of this practice by reviewing the prevalence of the adverse outcomes of gestational hypertension, intrauterine growth restriction (IUGR) and preterm birth.

Results: Sixty-two women had a serum hCG = 4.0 MoM and underwent Doppler study of uterine artery flow velocity waveform (Ut AFVW). Notching of the Ut AFVW afforded better predictive utility for any outcome than the resistance index (RI) alone or in combination with notching. For a composite adverse outcome of gestational hypertension, birthweight <10th centile and preterm delivery (<36 weeks) the presence of a uterine notch alone had sensitivity of 30.7%, specificity of 93.8%, a positive likelihood ratio of 4.95 and a negative likelihood ratio of 0.7. For the identification of severe fetal growth restriction, <5th centile, and pre-eclampsia, the presence of a notch offered a sensitivity of 50%, specificity of 96.3%, a positive likelihood ratio of 13.5 and a negative likelihood ratio of 0.5.

Conclusions: The identification of uterine artery notching by Doppler ultrasound as a component of the surveillance of women with unexplained elevated hCG levels significantly improves the prediction of pre-eclampsia and severe IUGR.

Treatment of deep venous thrombosis with low-molecular-weight heparin during pregnancy
ULANDER V-M and KAAJA R

Low-molecular-weight (LMW) heparins have been shown to be at least as effective as unfractionated (UF) heparin in the treatment of deep venous thrombosis (DVT) in non-pregnant subjects. LMW heparins have been shown to be safe when used during pregnancy as they do not cross the placenta. Up to now they have been used mainly in thromboprophylaxis during pregnancy and rarely in the treatment of acute DVT in pregnant women.

In a prospective observational study we compared the effectiveness and safety of the LMW heparin dalteparin versus UF heparin as initial treatment (first week) of DVT during pregnancy. After confirmation of DVT by ultrasonography, 10 women were treated with UF heparin (25430 IU/day, mean) and 21 women with dalteparin (16000 IU/day, mean) for 7 days and thereafter all women were given treatment doses of LMW-heparin for another 2 weeks. The dose was then gradually decreased and kept at high prophylactic dose until delivery.

One patient in the dalteparin group had recurrence of DVT 2 weeks after starting the treatment. No differences were observed between the groups in symptoms or bleeding complications during pregnancy and delivery.

Our results indicate that LMW heparin is as effective and safe as UF heparin for the first week of treatment, but LMW heparin has the advantage that it is easily administered and few laboratory controls are required.

Metastatic paraganglioma and pregnancy: a case report of a successful pregnancy outcome
ADAIR S, ELLWOOD D, YIP D, CARNEY G, KECSKES Z and TUCKER K

Metastatic para-ganglioma is a very rare condition, recently shown to be sometimes due to autosomal, dominantly transmitted mutations in SDHB, D and C genes. The patient (28 years old) presented with recurrent abdominal pain and a 3 year history of hypertension. CT scan demonstrated a para-aortic mass, and MIBG scan revealed three intra-abdominal foci. Surgical resection of the tumours followed and histology confirmed metastatic paraganglioma. She subsequently developed additional lesions in her thorax and left hip, and was treated with ablative MIBG therapy.

She became inadvertently pregnant in early 2003, and underwent further MIBG and CT scans in early pregnancy prior to the diagnosis. She was seen for antenatal care at 12 weeks and counselled about the risks of continuing the pregnancy, as well as the risks to the fetus. Blood pressure medication initially was with Phenoxybenzamine, but this was changed to Labetalol 100 mg b.d. at 18 weeks with good control. Ultrasound scans at 12, 18, 24, 28 and 31 weeks were normal. After corticosteroid administration, she underwent elective Caesarean section at 32 weeks to allow for further MIBG ablative therapy to take place. The infant was female, weighed 1820 g and required only short-term ventilation for hyaline membrane disease.

This case illustrates a successful pregnancy outcome in a woman with a serious, and potentially lethal condition. There were particular unknown fetal risks, both teratogenic and genetic, as well as potentially serious maternal risks of severe hypertension and disease progression. A multidisciplinary approach to management was an essential ingredient in this case.

Visual disturbance in pre-eclampsia
DHANJAL MK and ANTHONY J

Case reports have shown that pre-eclamptics with visual disturbances can have retinal detachments. The aim of this study was to identify the nature of ophthalmological abnormalities in patients with pre-eclampsia and persistent visual disturbance beyond delivery.

All women with pre-eclampsia and visual disturbance persisting beyond the first postnatal day at Groote Schuur Hospital over a 1 year period underwent formal ophthalmological review.

Twenty-two pre-eclamptic women required ophthalmological assessment for persisting visual disturbance postpartum. All women had severe pre-eclampsia with at least 3+ proteinuria.
and a mean highest antenatal blood pressure of 192/120. Twenty-one (95.5%) women had an abnormality identified at fundoscopy or CT scan. Seventeen (77.3%) women had exudative serous retinal detachments (10 of which were bilateral). Eight (36.4%) women had Elshnig’s spots (ischaemic infarcts in the choroid). All those with Elshnig’s spots had retinal detachments. Three (13.6%) women had parieto-occipital infarcts identified on CT scan. One patient had cortical blindness and one had optic atrophy.

Fundoscopically defined retinal abnormality occurs in most pre-eclamptic women with visual disturbances persisting beyond the first postnatal day. The most common abnormalities are exudative serous retinal detachment, which are usually reversible, and Elshnig’s spots. These are both manifestations of choroidal ischaemia. Parieto-occipital infarction, cortical blindness and optic atrophy can also occur.

Liver transplantation and pregnancy
MORTON AP

Fertility returns within months of successful liver transplantation. By June 2001 approximately 350 liver transplants had been performed on Australian women of potentially child-bearing age. The course and outcome of seven pregnancies in four liver transplant recipients is described. Four of the pregnancies in three mothers were complicated by intrahepatic cholestasis, and one pregnancy was complicated by acute on chronic renal failure requiring dialysis. The literature on pregnancy outcome in liver transplant recipients and the management of acute on chronic renal failure in pregnancy is discussed.

Review of our current clinical practice and outcomes related to bile acid measurements in obstetric cholestasis
THEIN AT, BREWSTER J, HIRST D and HORNER J

Until recently the diagnosis of obstetric cholestasis (OC), if made at all, was made on the basis of clinical observation, with apparent considerable inaccuracy. However, while the condition can increase risk of perinatal mortality and maternal morbidity, the current treatment of Ursodeoxycholic acid to reduce bile acid level in blood, involve use of this medication which is said to be potentially teratogenic and not licensed for use in pregnancy. Hence, it is extremely desirable to be able to identify with accuracy those cases really need of such treatment. Accordingly, we are attempting to identify a suitable local protocol for management of these.

We have carried out a review of all pregnant women who had had serum total bile acid levels measured during the whole of 2002. They were identified from the biochemistry database, and individual case notes were reviewed.

An initial review was carried out on women who had had serum bile acid levels measured on one or more occasions during the last quarter of 2002. A total of 78 tests had been performed on 32 cases during the period. Eighteen cases were found to have levels within normal limits, four required Ursodeoxycholic acid, and labour was induced in three women who were approaching term and remained symptomatic (but serum bile acid levels were only slightly raised). The remaining six cases resolved spontaneously, with raised initial bile acid levels falling to within normal in subsequent tests.

We shall present the outcomes of the review of all 2002 cases, with reference to our own normal range, and on the basis of this, we shall make recommendations for a protocol for diagnosis and management of OC, with a view to reduce perinatal mortality and maternal morbidity.

Serum glutathione S-transferase alpha 1–1, an index of hepatocellular damage, is raised at 24 weeks’ gestation in women who develop obstetric cholestasis
GIRLING J, DANN A, KENYON A, SEED P, NELSONPIERCY C, WILLIAMSON C, SHENNAN A and TRIBE R

Statement of Purpose: Glutathione S-transferase alpha 1–1 (GSTA1-1) is a highly sensitive and early indicator of hepatocellular damage. To determine in a longitudinal study whether GSTA1-1 is a useful marker for obstetric cholestasis (OC) and whether it distinguishes between OC and pruritus gravidarum (PG).

Statement of method: Serum GSTA1-1 was measured in 54 women who developed OC at a median gestation of 33.7 weeks (range 21–40.7) (those on ursodeoxycholic acid were excluded); 29 with PG and 22 with normal pregnancy. Serum was sampled at least three times between 16 weeks’ gestation and delivery.

Summary of Results: GSTA1-1 increased with gestation in the OC group (but not the other groups) and was significantly greater by 24 weeks’ gestation than in normal pregnancy and PG. In the OC group there was a highly significant correlation (P < 0.0001) between GSTA1-1 level and alanine aminotransferase (Spearman’s rank correlation: r = 0.764), and total

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bile acids ($r = 0.620$). GSTA1-1 was not related to severity of pruritus ($r = 0.069$, $P = 0.462$). A GSTA1-1 concentration of 5.5 µg/L had sensitivity 84.13% (CI: 72.74–92.12%), specificity 81.40% (CI: 66.60–91.61%), positive predictive value 86.89% (CI: 75.78–94.16%), negative predictive value 77.78% (CI: 62.91–88.80%), and the likelihood ratio for a positive test of 4.5 in differentiating OC from PG.

**Conclusion:** This is the first series of GSTA1-1 measurement in OC or PG. GSTA1-1 is a useful marker of liver dysfunction in distinguishing women with OC from those with PG.

**An unusual case of pre eclampsia**
SANGALLI M
Interactive case presentation. No abstract available.