New additions to publications by NALHN Staff 14 Dec 2018

Dr Zacharia Bazzi, Dr Ned Kinnear & Dr Greg Otto, Department of Surgery, who are joint authors of the attached article which was published in the ANZ Journal of Surgery. (Paper 1)

Dr Mahajan Rajiv, Department of Cardiology, who is one of the authors of the attached paper which was published in the journal, Seminars in Fetal and Neonatal Medicine. (Paper 2)

Dr Gus Dekker, Department of Obstetrics and Gynaecology, who is one of the authors of the attached article which was published in the The Lancet Diabetes & Endocrinology. (Paper 3)

The papers are now on display in the Library (Level 2). Please let us know if you or a colleague have had a paper published, and we will add it to our collection and email it out.

**Paper 1**

Impact of an acute surgical unit on outcomes in acute cholecystitis


**Background:** The acute surgical unit (ASU) model has been associated with improved outcomes for emergency general surgical patients. Few Australasian studies have investigated patients with cholecystitis and none from South Australia.

**Methods:** A retrospective cohort study compared patients admitted to our institution with acute cholecystitis during the 2 years before (traditional period) and after (ASU period) introduction of an ASU on 1 August 2012. Primary outcomes were length of stay, rates of definitive surgery on index admission, time to definitive surgery and proportion of cases performed in-hours. Secondary outcomes were time from emergency department referral to admission, time from radiologically confirmed diagnosis to theatre start, rates of conversion to open cholecystectomy, complications and cholelithiasis-related representations while awaiting definitive procedure.

**Results:** A total of 319 patients met the inclusion criteria; 172 and 147 pre- and post-ASU introduction, respectively. Compared with the traditional period, ASU patients had shorter length of stay (3.80 versus 2.83 days, \( P < 0.0001 \)), higher rates of surgery on index admission (70.9% versus 95.3%, \( P < 0.0001 \)), shorter time to definitive surgery (28.1 versus 22.1 days, \( P < 0.001 \)), lower rates of conversion to open cholecystectomy (18.0% versus 7.1%, \( P = 0.007 \)) and fewer complications (24.4% versus 6.1%, \( P < 0.0001 \)). Other outcomes were not significantly different.

**Conclusion:** Introduction of an ASU was associated with superior outcomes amongst patients admitted with acute cholecystitis. These findings extend the literature in support of the current model of care.

**Paper 2**

Characterizing localised re-entry with high resolution mapping: evidence for multiple slow conducting isthmuses within the circuit.


**Abstract:**

**Background:** Reentry circuits are considered to be critically dependent on a single protected slow conducting isthmus.

**Objectives:** To investigate conduction properties and EGM characteristics of the entire circuit in localised atrial re-entry circuits using high resolution mapping.

**Methods:** 15 localised re-entry atrial tachycardias were studied with high resolution mapping (Rhythmia). EGMs along the entire circuit were analysed off-line for fractionation, duration and amplitude. Maps were exported to MATLAB (MathWorks) to measure bipolar voltage and conduction velocities [CV] within the circuit. Slow conduction was defined as < 30 cm/s.

**Results:** 15 localised reentry (12: left atrial, 3: right atrial) with mean CL 273 +/-40ms were analysed using high resolution maps (22389/-13375 EGMs). A mean of 4.5+/1.6 slow conduction corridors were identified per circuit. Although the entire circuit was of low voltage, the bipolar voltage in slow conducting corridors was significantly lower than the rest of the circuit (0.22+/0.20mV vs 0.50+/0.48mV; \( p <0.001 \)). The mean conduction velocity of the circuit, excluding slow conduction areas, was 90.3 +/-34.3 cm/s vs 13.9 +/-3.5 cm/s (\( p<0.001 \)) in the slow conduction corridors. EGM analysis at slowest conduction corridors...
demonstrated fractionation (100%) with longer EGM duration when compared to the others slow conduction corridors along the circuit (99+/−9 ms vs 74+/−11 ms; p = 0.003).

**Conclusions:** In contrast to current understanding, localised atrial reentry circuits have multiple sequential "corridors" of very slow conduction (2 to 7) which contribute to maintenance of arrhythmia. The localised reentry occurs in low voltage areas with voltage further reduced in these multiple slow conducting corridors.

**Paper 3**

Effect of metformin in additional to dietary and lifestyles advice for pregnant woman who are overweight or obese: the GRoW randomised, double-blind, placebo-controlled trail.


**Abstract:**

**Background:** Maternal overweight and obesity are associated with well recognised pregnancy complications. Antenatal dietary and lifestyle interventions have a modest effect on gestational weight gain without affecting pregnancy outcomes. We aimed to assess the effects on maternal and infant outcomes of antenatal metformin given in addition to dietary and lifestyle advice among overweight and obese pregnant women.

**Methods:** GRoW was a multicentre, randomised, double-blind, placebo-controlled trial in which pregnant women at 10-20 weeks' gestation with a BMI of 25 kg/m2 or higher were recruited from three public maternity units in Adelaide, SA, Australia. Women were randomly assigned (1:1) via a computer-generated schedule to receive either metformin (to a maximum dose of 2000 mg per day) or matching placebo. Participants, their antenatal care providers, and research staff (including outcome assessors) were masked to treatment allocation. All women received an antenatal dietary and lifestyle intervention. The primary outcome was the proportion of infants with birthweight greater than 4000 g. Secondary outcomes included measures of maternal weight gain, maternal diet and physical activity, maternal pregnancy and birth outcomes, maternal quality of life and emotional wellbeing, and infant birth outcomes. Outcomes were analysed on an intention-to-treat basis (including all randomly assigned women who did not withdraw consent to use their data, and who did not have a miscarriage or termination of pregnancy before 20 weeks' gestation, or a stillbirth). The trial is registered with the Australian New Zealand Clinical Trials Registry, number ACTRN12612001277831.

**Findings:** Of 524 women who were randomly assigned between May, 28 2013 and April 26, 2016, 514 were included in outcome analyses (256 in the metformin group and 258 in the placebo group). Median gestational age at trial entry was 16.29 weeks (IQR 14.43-18.00) and median BMI was 32.32 kg/m2 (28.90-37.10); 167 (32%) participants were overweight and 347 (68%) were obese. There was no significant difference in the proportion of infants with birthweight greater than 4000 g (40 [16%] with metformin vs 37 [14%] with placebo; adjusted risk ratio [aRR] 0.97, 95% CI 0.65 to 1.47; p=0.899). Women receiving metformin had lower average weekly gestational weight gain (adjusted mean difference -0.08 kg, 95% CI -0.14 to -0.02; p=0.007) and were more likely to have gestational weight gain below recommendations (aRR 1.46, 95% CI 1.10 to 1.94; p=0.008). Total gestational weight gain, pregnancy and birth outcomes, maternal diet and physical activity, and maternal quality of life and emotional wellbeing did not differ significantly between groups. Similar numbers of women in both treatment groups (76% [159/208] in the metformin group and 73% [144/196] in the placebo group) reported side-effects including nausea, diarrhoea, and vomiting. Two stillbirths (placebo group) and one neonatal death (metformin group) occurred; none of the perinatal deaths were determined to be attributable to participation in the trial.

**Interpretation:** For pregnant women who are overweight or obese, metformin given in addition to dietary and lifestyle advice initiated at 10-20 weeks' gestation does not improve pregnancy and birth outcomes.