



Department of  
Obstetrics and Gynaecology

**26<sup>th</sup> Annual Resident Research Day**

Friday, April 27, 2012

Parker Reception Room  
IWK Health Centre

## **Program Sponsorship**

We gratefully acknowledge financial support for this program from:

**Atlantic Society of  
Obstetricians and Gynecologists**

**Research Services, IWK Health Centre**

and

**Canadian Foundation for Women's Health**

## Thank you to our Judges:

**Dr. Janice Kwon,**  
Division of Gynaecologic Oncology  
University of British Columbia

**Dr. Shelly McNeil,**  
Division of Infectious Diseases  
Dalhousie University

**Dr. Stefan Kuhle**  
Perinatal Epidemiology Research Unit  
Dalhousie University

## Resident Research Day Department of Obstetrics and Gynaecology Dalhousie University

April 27, 2012

- 0800 Morning Reception with refreshments  
PARKER RECEPTION ROOM
- 0815 Welcome – Dr. B.A. Armson  
Professor and Head,  
Department of Obstetrics and Gynaecology  
Dalhousie University
- Session I: Moderator, Dr. Linda Dodds**
- 0825 INVITED SPEAKER**  
Dr. Shelly McNeil, Division of Infectious Diseases,  
Dalhousie  
*“Vaccine clinical trials: “challenges” and opportunities”*
- 0900 Anita Smith, PGY2  
*Is Preterm Prolonged Rupture of Membranes latency associated with antibiotic prophylaxis regimen in known GBS positive women?*
- 0915 Kyungsoo Shin, MSc candidate, Physiology  
*“Differential apelin isoform production and involvement in obesity “*
- 0930 Mila Smithies, PGY3  
*“The prevalence of smoking among pregnant women in Nova Scotia from 1997 to 2010”*
- 0946 Jason Burrows, MFM Fellow  
*“The Effect of Initial Mode of Delivery on Stillbirth Risk in a Subsequent Pregnancy”*
- 1000 NUTRITION BREAK**

- 1030 Erin MacDonald, PGY2  
*Day 3 follicle stimulating hormone as a predictor of ovarian stimulation protocols – a work in progress*
- 1044 Mary (Molly) MacCormick, MSc candidate  
Applied Human Nutrition, MSVU  
*“The Effect of Snacking on Glycaemic Regulation and Satiety in Children”*
- 1100 Amanda O’Reilly, Med2  
*Patient factors predicting choice of hysterectomy for the management of menorrhagia*
- 1116 Mike Ripley, PGY4  
*“Psychological stress among women undergoing in vitro fertilization treatment”*
- 1132 Catherine Brown, MSc candidate, CH&E  
*“Exploring the Gap Between Breastfeeding Practices and Recommendation: The Rate and Determinants of Exclusive Breastfeeding to Six Months in Nova Scotia Mothers”*
- 1148 Trina Stryker, MFM Fellow  
*In Pregnancies Complicated by Diabetes, Does Prelabour Rupture of Membranes Increase Perinatal Risk?*

**1200-1300 LUNCH (Classroom B&C)**

**Session II: Moderator Dr. Christy Woolcott**

- 1300 INVITED SPEAKER:**  
**Introduction By Dr. Katharina Kieser, Division of Gyn-Oncology, Dalhousie**  
Dr. Janice Kwon, University of British Columbia  
*“The Ob/Gyn's role in hereditary cancer syndromes: How to save a life”*
- 1400 Priscilla Frenette, Med2  
*“Effect of latency on neonatal and maternal outcomes following preterm premature rupture of membranes”*
- 1416 Alex Legge, Med2  
*“Obesity does not impact in vitro fertilization outcomes in women”*
- 1432 Jason Kim, PGY2  
*“The effect of e-learning modules on exam scores of third year Dalhousie obstetrics and gynecology students”*
- 1446 Rebekah Zee, Med2  
*Once a Caesarean, always a Caesarean? VBAC trends in Nova Scotia*
- 1502 Jeffery Gagnon, PhD candidate, Physiology  
*“Investigating the Mechanism of Ghrelin Release”*
- 1518 Amanda O’Reilly, Med2  
*“Factor V Leiden and pregnancy complications: a systematic review & meta-analysis”*
- 1645 Awards Presentation**  
Cocktails and Hors d’oeuvres to be served in the Parker Reception Room

## Abstracts

### **Is preterm prolonged rupture of membranes latency associated with antibiotic prophylaxis regimen in known GBS positive women?**

A Smith, V Allen, J Walsh, K Jangaard

**Background:** Presently there are no guidelines pertaining to appropriate management of GBS positive women with PPROM. GBS colonization has previously been found to complicate PPROM compared to women negative for GBS in terms of maternal and neonatal outcomes. The SOGC PPROM guidelines state that either a regimen of amoxicillin and erythromycin or erythromycin alone, are equally effective with respect to pregnancy prolongation and neonatal outcomes in pregnancies affected by PPROM. There are no equivalency or superiority trials in the literature, making it unclear which antibiotic regimen is optimal. Recent literature has demonstrated an increasing macrolide resistance among GBS isolates and a paucity of data demonstrating reliable tissue penetration of erythromycin.

**Hypothesis:** The investigators hypothesize that GBS colonized women with PPROM who are GBS colonized may benefit from the administration of both ampicillin and erythromycin for the management of PPROM, compared to erythromycin alone.

**Methods:** This population based retrospective cohort study will use the Nova Scotia Atlee Perinatal Database and supplemental chart review to evaluate the influence of ampicillin and erythromycin on PPROM latency and neonatal sepsis compared to erythromycin alone at the IWK Health Centre.

**Data Analysis:** The primary outcome of the study is latency, defined as a continuous variable, and a Wilcoxon rank sum test analysis will be conducted comparing those exposed to erythromycin only versus erythromycin and ampicillin for the management of PPROM. We will also conduct survival analysis of the primary outcome

represented by a Kaplan Myer curve. We will define our secondary outcome, neonatal infection, as a dichotomous variable, and conduct a Fisher Exact Test. Propensity scores will be used to account for confounders.

### **Differential apelin isoform production and involvement in obesity**

K. Shin, A. Pandey, J.K. Rainey, Y. Anini

**Introduction:** Apelin is a peptide hormone expressed as a 77-amino acid preproprotein that is processed into bioactive isoforms 13-36 residues in length. The 55-residue proapelin isoform contains dibasic sites suggestive of proprotein convertase subtilisin kexin (PCSK)-dependent processing. Apelin is an adipokine secreted from adipose and other tissues with increased expression in obesity. Apelin has been shown to have protective roles in cardiovascular disease.

**Aims:** To test the mechanism of differential production of the bioactive apelin isoforms, we correlated the structural properties of proapelin to furin-mediated cleavage. In parallel, the role of apelin isoforms in fat cell regulation was explored by monitoring free fatty acid release (adipolysis) and cAMP signaling in adipocytes.

**Methods:** Furin-mediated proapelin processing is being quantified by high performance liquid chromatography. Proapelin structure is being analyzed by circular dichroism, fluorescence and nuclear magnetic resonance spectroscopy. Adipolysis is monitored using 3T3-L1 adipocytes incubated in apelin-KRBH solution for 1 hour at 37°C with media analyzed for free glycerol. cAMP is quantified in cell lysates from adipocytes treated with apelin for 30 minutes at 37°C.

**Results:** Proapelin structure is dependent on pH, but independent of temperature. All apelin isoforms except apelin-36 significantly inhibited isoproterenol-stimulated adipolysis through cAMP dependent pathway.

**Discussion:** Our findings are the first to demonstrate the inhibition of adipolysis by all apelin isoforms in 3T3-L1 adipocytes through cAMP dependent pathway. Apelin has therapeutic potential against obesity-mediated complications. pH-dependent structural changes

are suggestive of proapelin obtaining specific structuring at different points in the secretory pathway.

### **The prevalence of smoking among pregnant women in Nova Scotia from 1997 to 2010**

M Smithies, L Dodds, C O'Connell

**Background:** Although smoking among pregnant women is becoming less common in Canada, it remains a significant and preventable cause of adverse outcomes, both in the perinatal period as well as later in childhood. Canadian data on maternal smoking in pregnancy is limited, and primarily based on data from surveys rather than data that are population-based. Despite a national decreasing trend in maternal smoking rates, recent data suggest that the number of women smoking during pregnancy in Nova Scotia is stable or increasing. The primary objective of this study is to determine the prevalence of smoking during pregnancy in Nova Scotia between 1997-2010. The secondary objective is to identify socio-demographic and pregnancy characteristics associated with maternal smoking status.

**Methods:** This population-based descriptive study used the Atlee Perinatal Database to determine the prevalence of smoking during pregnancy between 1997-2010. The primary outcome was smoking during pregnancy (at the 1<sup>st</sup> prenatal visit and/or admission). Socio-demographic and pregnancy factors (maternal age at 1<sup>st</sup> pregnancy, parity, number of fetuses, substance abuse, psychiatric illness, rural/urban residence, socio-economic status, partnered status, and weight) that were found to be significantly associated with maternal smoking status at the bivariate level were then examined at the multivariate level using logistic regression.

**Results:** In total, 123,180 residents of Nova Scotia delivered a live or stillborn baby (birth weight  $\geq$  500g), between the years of 1997 and 2010, and had available smoking status information for at least one of the pregnancy time points (1<sup>st</sup> prenatal visit and/or admission). Overall, the maternal smoking rate was 24.8%. The rate decreased from 30.2% in 1997 to 21.7% in 2010. The prevalence of heavy smoking (defined as  $\geq$  12 cig/day) in pregnancy dropped from 19.9% to 11.8% during this same time frame. All of the socio-demographic and pregnancy factors examined except number of fetuses (singleton/multiple) remained significant at the multivariate level. Women who smoked in pregnancy were more likely to be younger at the time of their first pregnancy, multiparous, substance abusers, diagnosed with a psychiatric illness, living in a rural community, of low socio-economic status, not partnered, and not obese.

**Interpretation:** Although maternal smoking rates in pregnancy in Nova Scotia continue to drop, the rate has plateaued since 2003, closely mirroring the trend in pre-pregnancy smoking among these same women. More encouraging is the decreasing rate of heavy smoking in pregnancy, highlighting the importance and effectiveness of harm reduction counselling in the pre-natal period. By identifying

those characteristics associated with women in Nova Scotia who continue to smoke while pregnant, smoking cessation interventions can be better targeted to the subgroup of women who are most likely to smoke during pregnancy

### **The Effect of Initial Mode of Delivery on Stillbirth Risk in a Subsequent Pregnancy**

J Burrows, H Scott, L Dodds, V

**Objective:** To determine the effect of initial mode of delivery (MOD) on subsequent stillbirth risk.

**Study Methods:** Data for all paired first (nulliparous) and second (primiparous) pregnancies between 1980 and 2009 was derived from the Nova Scotia Atlee Perinatal Database. Primiparous women were assessed for unexplained stillbirth risk by previous MOD. Second pregnancy multifetal gestation, major fetal anomalies or first pregnancy stillbirth cases were excluded. Adjusted hazard ratios (aHR) and 95% confidence intervals (CI) controlling for age, obesity, pre-existing hypertension, diabetes, severe pre-eclampsia, socioeconomic status, and smoking were estimated using cox regression. Subanalyses of stillbirth risk by previous MOD were performed for gestational age (GA) at stillbirth, GA at initial delivery, and type of previous Caesarean delivery (CS).

**Results:** 55,116 paired eligible pregnancies were identified. There were 83 unexplained stillbirths in second pregnancies (0.15% prevalence). There was no difference in unexplained stillbirth risk between CS and vaginal delivery (aHR 1.07, 95% CI 0.64–1.79). Subanalysis by GA of stillbirth showed no difference in stillbirth risk (aHR 0.45, 95% CI 0.08–2.72 < 28 weeks, aHR 1.07, 95% CI 0.61–1.89 ≥ 28 weeks). Subanalyses by GA of first pregnancy delivery and by type of CS also showed no difference in stillbirth risk (aHR 3.96, 95% CI 0.23–68.39 ≤ 34 weeks, aHR 1.08, 95% CI 0.63–1.84 > 34 weeks, and aHR 1.12, 95% CI 0.66–1.89 for low transverse uterine incisions vs. vaginal delivery, respectively).

**Conclusion:** This large population-based study demonstrated no increase in risk of unexplained stillbirth with caesarean delivery in the initial delivery.

### **Day 3 follicle stimulating hormone as a predictor of ovarian stimulation protocols – a work in progress**

E MacDonald, L Hamilton, R Bouzayen

**Background** In the developed world rates of assisted reproductive technology and in-vitro fertilization are rising. ART is not publically funded in the Maritimes. Patients must incur significant cost to under go these therapies if they have infertility; additionally there are some health risks associated with ART. Currently ovarian stimulation protocols are based on published protocols and clinician preference. The primary objective of ovarian stimulation is to retrieve the most number of follicles while preventing ovarian hyper stimulation syndrome (OHSS). No one has yet evaluated if the best ovarian stimulation protocol can be based on a simple hormonal marker, day 3 Follicle Stimulating Hormone (FSH).

**Objective** This study aims to identify the relationship between patient baseline day 3 FSH and ovarian response to low, medium and high dose gonadotropin stimulation protocols.

**Study Design** This study is a retrospective cohort study, which will review women who have undergone an ovarian stimulation protocol with gonadotropins at The Atlantic Assisted Reproductive Therapies Centre from 2007-2012 via the AART database. Primary out come measures will be number of oocytes retrieved. Secondary out come measures will include day 5 estradiol, quality of embryos, successful pregnancy, live birth, and incidence of OHSS. Factors affecting fertility will also be collected, these would include but are not limited to demographics, subfertility cause, past ovarian procedures, day 3 FSH, IVF versus IVF+ICSI, FSH protocol followed, number of ovarian stimulation cycles, increase in FSH dose mid cycle, cancelled cycles due to (poor response to stimulation, elected to freeze embryos, or other reasons), failed fertilization, and absence of normal embryos. Research ethics approval is pending.

## **The Effect of Snacking on Glycaemic Regulation and Satiety in Children**

M McCormick, B Luhovyy, Y Anini

**Background:** The obesity rate in children has doubled in last few decades. At the same time, there has been an escalation in the incidence of type-2 diabetes in children, previously known as adult-onset diabetes. In Canada, approximately 95% of children with type 2 diabetes are obese at diagnosis, their average age is 13.7 years and 8% of them are younger than 10 years old. The analyses of food patterns and consumption rates in children showed that the energy intake and frequency of snacking events has increased in last thirty years. Therefore it is important to identify how snacking contributes to the glycaemic regulation in children.

**Hypothesis:** Dairy-based snack will provide better glycaemic control and greater satiety compared to a popular non-dairy snack food.

**Objective:** To determine glycaemic and insulin responses to dairy and non-dairy snack products and their effect on subjective appetite in 9-14 y children.

**Methods:** This randomized crossover study will consist of two sessions over two weeks. Ten normal weight and ten overweight children 9-14 y will be recruited and invited to CCfV IWK for each session. Children will fast for 12 hours before breakfast and after breakfast until their arrival. A standardized breakfast will be supplied and will be consumed at home on the day of each session. Children will be randomized to either a dairy (yogurt) or non-dairy (cookies) dietary treatments. Both treatments will contain 25 g of available carbohydrates. Upon arrival, children will be asked to complete the visual analogue scale (VAS) for subjective appetite and physical comfort. Following completion of the VAS questionnaires, a registered nurse will take baseline blood samples and children will be provided with a treatment (yogurt or cookies). Following the consumption of the treatment, blood samples will be collected and VAS will be completed at 30, 60, 90 and 120 min. All blood samples will be aliquoted and frozen at -80°C. Blood glucose and insulin will be analyzed with commercially available kits (enzymatic, EIA/ELISA) or with clinical biochemical analyzers (e.g. Roche Modular, Roche Diagnostics). Data will be analyzed with SAS software (SAS Institute Inc, Cary, NC). All results will be presented as mean  $\pm$  standard error of the mean (SEM). The statistical significance will be concluded with the P-value less than 0.05.

**Acknowledgment:** This study is supported by the grant from Dairy Farmers of Canada

## **Patient factors predicting choice of hysterectomy for the management of menorrhagia**

**A O'Reilly, G Graves**

**Objective:** The objective of this study was to investigate factors predicting treatment choice for women with menorrhagia.

**Methods:** A retrospective chart review of premenopausal women referred to a gynaecology clinic of the IWK Health Centre from June 2008 - January 2011 with menorrhagia (n = 181) was conducted. Patients who were treated with various medical or surgical options were compared with respect to demographics, menorrhagia characteristics, structural pathology, and past medical history. Factors were analyzed using ANOVAs with LSD or chi-squared tests with Fisher's exact test, as well as a logistic regression model.

**Results:** The majority of patients opted for surgical treatment (60.8 %, 27.1% hysterectomy, 27.6% endometrial ablation, 6.1% other) rather than medical options (37.0%, 4.4% non-hormonal medications, 23.8% hormonal medications, 8.8% hormonal intrauterine system), while 2.2% chose no treatment. Mean BMI was  $29.2 \pm 7.0$  and it did not differ among treatment groups. A significant number of patients who chose medical treatments over hysterectomy or ablation wanted to maintain fertility. The following factors were associated with significant numbers of patients choosing hysterectomy: age, fibroids, adenomyosis, large uterus, ovarian cysts, and family history of hysterectomy. The logistic regression model demonstrated that older age (mean  $43.4 \pm 5.5$  years), fibroids, adenomyosis, ovarian cysts, longer duration of menorrhagia prior to referral (mean  $30.4 \pm 31.7$  months), and previous caesarean section predicted preference of hysterectomy treatment.

**Conclusion:** While treatment choices are individualized, this study suggests that patient factors such as older age, previous surgery, and uterine pathology favour hysterectomy and should be considered during decision making.

## **Psychological stress among women undergoing in vitro fertilization treatment.**

M Ripley, R Bouzayen

**Objective:** To evaluate whether psychological stress varies with phase of in vitro fertilization treatment.

**Design:** Prospective cohort study.

**Setting:** Infertility clinic in Halifax, Nova Scotia between 2009 and 2012.

**Patients:** Twenty women completed four questionnaires on four occasions during an IVF cycle.

**Intervention(s):** Patients completed measures of psychological stress including the Beck Depression Inventory - II, State-Trait Anxiety Scale, Infertility Experiences Questionnaire, and Dyadic Adjustment Scale.

**Main Outcome Measure(s):** Scores of above psychological questionnaires at four points during an IVF cycle: at the beginning of GnRH agonist treatment, after 8-10 days of agonist treatment, the day of embryo transfer, and the day of the pregnancy test.

**Results:** Mean psychological distress scores did not differ significantly throughout the IVF cycle for any of the psychological stress indices.

**Conclusions:** Psychological stress does not change during the different phases of an IVF cycle.

## **Exploring the Gap Between Breastfeeding Practices and Recommendation: The Rate and Determinants of Exclusive Breastfeeding to Six Months in Nova Scotia Mothers**

CRL Brown, L Dodds, R Attenborough, J Bryanton, A Elliott Rose, G Flowerdew, D Langille, L Lauzon, S Semenic

**Background:** In spite of the strong evidence supporting the importance of breastfeeding during the first six months of life, rates of exclusive breastfeeding remain low in Canada. Only 14% of Canadian women are currently meeting Health Canada's recommended standard of exclusive breastfeeding for six months, with an even lower rate of 9% in Nova Scotia.

**Objective:** This study aims to identify the rate and determinants of exclusive breastfeeding to six months in a Nova Scotia population-based cohort.

**Methods:** We conducted a retrospective cohort study of infants born between 2006 and 2009 in two District Health Authorities (DHAs) in Nova Scotia, Canada. We obtained data from record linkage between a perinatal database and a public health database, which captured breastfeeding status in infants for six months. The main outcome was exclusive breastfeeding at six months. We determined adjusted odds ratios through multivariate logistic regression.

**Results:** Among the 4,533 women in this cohort, 64% initiated breastfeeding. The rate of exclusive breastfeeding at six months was 9%. The largest drop-off in exclusive breastfeeding occurred within the first six weeks after birth; the rate of exclusive breastfeeding at six weeks was 31.5%. Significant predictors of longer exclusive breastfeeding duration identified by multivariate modeling included higher maternal education level, being married or in a common-law relationship, being a non-smoker, having a normal weight, and DHA of residence.

**Conclusions:** Rates of exclusive breastfeeding remain lower in these districts than elsewhere in Canada. Of importance, the first six weeks after birth represents a critical intervention window. Understanding the determinants of longer exclusive breastfeeding will assist policy makers in designing interventions to better support mothers and their newborns.



## **In Pregnancies Complicated by Diabetes, Does Prelabour Rupture of Membranes Increase Perinatal Risk?**

T. Stryker, D. Simpson, L. Dodds, BA Armson, V. Allen

**OBJECTIVE:** To estimate the influence of prelabour rupture of membranes (PROM) on term and preterm outcomes in infants born to diabetic mothers.

**METHODS:** We conducted a population-based cohort study of women with diabetes in pregnancy (preexisting or gestational) using data from the Nova Scotia Atlee Perinatal Database from 1988 to 2009. Outcomes in newborns of diabetic women following birth at term with PROM were compared to those without PROM. In a second analysis, outcomes in newborns of diabetic women following preterm birth (<37 weeks) with preterm PROM (PPROM) were compared to those without PPRM. Logistic regression was used to control for biologically plausible confounding variables. The effects were expressed as odds ratios and 95% confidence intervals.

**RESULTS:** A total of 6503 diabetic women delivered 6488 liveborn infants (5818 at term and 630 preterm). Among term births, there was an increased risk of composite neonatal morbidity and mortality (aOR = 1.81, 1.09-3.01) and composite neonatal infection (aOR = 2.09, 1.20 – 3.64), though risk of chorioamnionitis or funisitis was not significantly increased (aOR = 1.41 0.84-2.38) in those with PROM (N = 706) compared to those without PROM (N = 5125). Among preterm births, risk of composite neonatal morbidity and mortality was not increased (aOR = 1.17, 0.69-1.97) with PPRM (N = 223) compared to without PPRM (N = 427). There was, however, an increased risk of chorioamnionitis or funisitis (aOR = 6.27, 2.47-15.92) and composite neonatal infection (aOR = 2.18, 1.03-4.59).

**CONCLUSIONS:** There is an increased risk of infectious and overall morbidity in infants born at term to diabetic women following PROM. Prior to term, overall morbidity and mortality is not increased. However, there is an increased risk of neonatal infectious morbidity following PPRM. Further research is needed to develop strategies to reduce perinatal risk following PROM in diabetic patients.

## **Effect of latency on neonatal and maternal outcomes following preterm premature rupture of membranes**

P. Frenette, L. Dodds, BA Armson, K. Jangaard

**Background:** Preterm premature rupture of membranes (PROM) has been associated with significant morbidity in both mother and neonate. This study investigated the effect of latency between membrane rupture and delivery on maternal and neonatal outcomes in a cohort of live hospital births.

**Methods:** Cases of PROM occurring between 24<sup>0/7</sup> and 36<sup>6/7</sup> weeks of gestation from 1988 to 2009 were identified from a Nova Scotia population-based clinical database. Associations between pre-defined latency periods (< 24 hours, 48 hours-7 days and > 7 days) and outcomes pertaining to mother and neonate were investigated using multivariate logistic regression. Primary outcomes included a composite neonatal infectious morbidity variable (sepsis, pneumonia, necrotizing enterocolitis, death), a composite neonatal prematurity morbidity variable (moderate or severe respiratory distress syndrome, chronic pulmonary disease of prematurity, grade 3 or 4 intra-ventricular haemorrhage, periventricular leukomalacia, death), and a composite maternal infectious morbidity variable (endometritis, septicaemia, peritonitis, wound infection).

**Results:** Four thousand three hundred twenty-nine cases of preterm PROM were included in the study cohort. Between gestational ages of 24<sup>0/7</sup> and 33<sup>6/7</sup> weeks, the odds of composite neonatal prematurity-related morbidity were significantly decreased at latencies of 48 hours - 7 days (OR: 0.39; 95% CI: 0.23-0.65) and > 7 days (OR: 0.23; 95% CI: 0.13, 0.41) when compared to latencies of < 24 hours. Similar results were observed between 34<sup>0/7</sup> and 36<sup>6/7</sup> weeks of gestation. There were no significant differences in the odds of composite neonatal or maternal infectious morbidity in either gestational age grouping.

**Conclusions:** The results suggest that prolonging pregnancy following preterm PROM may contribute to less prematurity-related morbidity without placing mother or neonate at risk for serious infection.

## **Obesity does not impact in vitro fertilization outcomes in women**

A Legge, L Hamilton, R Bouzayen, D Young

**Introduction:** While the negative effects of obesity on spontaneous reproduction are well known, the impact of obesity on assisted reproductive technologies, such as in vitro fertilization (IVF), remains controversial. The objective of this study was to examine the effect of body mass index (BMI) on gonadotropin dose requirements and other cycle outcomes in women undergoing in vitro fertilization.

**Methods:** A retrospective cohort study of 752 women who underwent a total of 951 IVF or IVF/ICSI cycles with fresh, autologous embryos between January 2007 and May 2011. Patients were classified into three groups based on body mass index: BMI < 25 kg/m<sup>2</sup> (461 cycles), 25 ≤ BMI < 30 (277 cycles), and BMI > 30 (179 cycles). Patient characteristics and IVF cycle outcomes were compared between the three groups. Main outcome measures included total FSH dose required, duration of stimulation, cycle cancellation, number of oocytes collected, fertilization rate, implantation rate and ongoing pregnancy. We performed multivariable analyses, adjusting for potential confounders such as age at cycle start, day 3 serum FSH level, smoking status, PCOS status, and duration of infertility.

**Results:** There were no significant differences between the three BMI groups for any of the IVF cycle outcomes measured, including the total FSH dose required for ovarian stimulation. Odds of cycle cancellation or clinical pregnancy were not significantly different between normal weight, overweight, and obese women.

**Conclusions:** Obese patients do not require higher doses of gonadotropins for ovarian stimulation than normal weight individuals. At our center, female obesity does not negatively impact the outcomes of in vitro fertilization. Our findings call into question the legitimacy of policies limiting IVF access based on elevated BMI.

## **The effect of e-learning modules on exam scores of third year Dalhousie obstetrics and gynecology students.**

J Kim, J Coolen

**Introduction:** The Dalhousie Obstetrics and Gynaecology clinical clerkship program has distributed sites throughout the maritime provinces. As a result, the clinical exposure obtained by an individual student may notably differ from that of another classmate. With the expansion of medical schools, the importance of online learning materials has grown significantly. Online modules can supplement and/or reinforce a student's learning experience, and be available to all students regardless of location. The additional learning resource will aid in the development of future clinicians.

**Purpose:** The objective of this project is to develop six online modules for the Dalhousie clerkship program that students will be able to complete during their Obstetrics and Gynaecology rotation. The modules will be available to all students by April 2013. To determine the effect of the online modules, the obstetrics and gynaecology exam results of the initial group of students (those completing the rotation from September 2012 to March 2013) will be compared to that of the final group of students (those completing the rotation from April 2013 to September 2014), who will be the first to access the e-learning modules.

**Methods:** Six online modules will be developed focusing on three main topics of obstetrics and gynecology respectively. They will be created using the SoftChalk software program, and students will be able to gain access through the Dal Blackboard learning system. Data analysis will be performed using a t-test calculation to determine if the e-learning modules improve the exam scores of Dalhousie clinical clerks.

**Hypothesis:** This project will provide the Dalhousie obstetrics and gynaecology clerkship program with an additional learning resource. The e-learning modules will improve the overall exam scores of the clinical clerks, and provide them with a more well rounded learning experience.

## **Once a Caesarean, always a Caesarean? VBAC trends in Nova Scotia**

RA Zee, C O'Connell, BA. Armson

**Objective:** 1) To estimate the rates of vaginal birth after Caesarean (VBAC) in Nova Scotia over time, 2) To describe maternal and neonatal outcomes of women undergoing trial of labour versus elective Caesarean delivery.

**Methods:** A population-based retrospective cohort study of women with one prior Caesarean birth with a transverse incision and singleton pregnancy in the vertex position was conducted using the Nova Scotia Atlee Perinatal Database from 1990 – 2009. Temporal trends were determined for the study period and maternal and neonatal outcomes were compared. SAS 9.2 software was used for descriptive and comparative analyses.

**Results:** From a total of 179,212 live, term births 15,901 met inclusion criteria and were candidates for VBAC. Of these mothers, 47.3% opted for an elective Caesarean section and 52.7% planned a trial of labour (TOL). Although the percent of VBAC candidates remained relatively constant, the percent of those attempting VBAC decreased significantly from a maximum of 76.2% in 1995 to a low of 32.7% in 2007. Throughout this period, the rate of successful VBAC attempts remained constant at 66.5%. Women who had a TOL were more likely to experience uterine rupture and obstetrical trauma. More neonates delivered vaginally experienced major trauma and birth depression but fewer required mechanical ventilation.

**Conclusion:** Though VBAC rates have declined significantly in Nova Scotia since 1995, the likelihood of a successful VBAC attempt remains high. Maternal and neonatal morbidity are higher in women attempting VBAC than those who elect caesarean birth

## **Investigating the Mechanism of Ghrelin Release**

J Gagnon, Y Anini

**Background:** An important aspect in appetite regulation is the hormonal signaling of energy status. Ghrelin is a peptide hormone, produced in the endocrine cells of the stomach, that increases feeding and promotes the storage ingested calories. Accordingly, ghrelin levels are highest in the fasted state. Furthermore, obesity is correlated with reduced circulating ghrelin. Despite the extensive literature examining how ghrelin levels may change in response to energy status, little is known on the actual mechanism of ghrelin release from the stomach. Our group recently developed a ghrelin secreting primary stomach cell culture to address this question.

**Objective:** We aim to determine the impact of energy sensing hormones (insulin, glucagon) and neurotransmitters on the release of ghrelin and the cellular mechanism of how this occurs.

**Methods:** Primary culture of new born rat stomach cells was completed by whole stomach enzymatic dispersion. Cells were maintained in serum supplemented media. Treatments were given directly into culture media for 4 hours, media was collected and analyzed for ghrelin peptide content by immunoassay.

**Results:** We found that ghrelin secretion is stimulated through the  $\beta$ -adrenergic but not through the cholinergic pathway. We found that insulin inhibited while glucagon stimulated ghrelin release. We then showed that the inhibitory effect of insulin is occurring through the PI3K-AKT signaling pathway. Interestingly, we demonstrated that ghrelin cells could be made insulin resistant by exposure to high levels of insulin.

**Conclusions:** Our findings show the role of neurotransmitters and hormones as well as highlight the mechanism of insulin and insulin resistance in the regulation of ghrelin secretion. Understanding how ghrelin levels can be directly altered may enable new strategies for appetite regulating therapies.

## **Factor V Leiden and pregnancy complications: a systematic review & meta-analysis**

**A O'Reilly, J-A Brock, V Allen**

**Background:** The Factor V Leiden (FVL) mutation is a common inherited thrombophilia. Some previous studies have reported an association between FVL and obstetric complications, while others have yielded conflicting results. We have conducted a systematic review and meta-analysis to examine the controversial potential link between FVL and intrauterine growth restriction (IUGR), preterm birth and preeclampsia.

**Methods:** We searched PubMed (Medline), Embase, Scopus, CINAHL, and the Cochrane Library through March 2012. We also identified studies from reference lists of relevant articles and reviews. We included cohort and case-control studies with maternal or neonatal participants with homozygous or heterozygous FVL mutations as determined by DNA-based PCR assay. Our outcome measures included IUGR, preterm birth, and preeclampsia. Study quality was appraised based on predetermined criteria for internal and external validity. Data were extracted by two independent reviewers and pooled where appropriate. Odds ratios with 95% confidence intervals were computed.

**Results:** 119 studies met our inclusion criteria. We conducted a preliminary analysis of 6 case-control studies investigating IUGR defined as birth weight less than the 10<sup>th</sup> percentile according to standards for gestational age. A chi-squared test of the data in these studies indicated that there is no significant association between FVL and IUGR ( $X^2 = 1.50$ ,  $p < 0.25$ ). Results are pending for alternate IUGR definitions, cohort studies, and preterm birth and preeclampsia outcomes.

**Conclusion:** Based on our initial analysis, FVL mutation is not associated with IUGR.