James A. Low Research Day
Department of Obstetrics & Gynaecology

PROGRAMME
April 8, 2022

Queen's UNIVERSITY

Contents

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James A. Low Research Day

Friday, April 8, 2022

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12:00–12:30	**LUNCH BREAK |** ***Move back to Main Room***

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13:30	**O16 Samantha Levang** Examining Factors Associated with Adaptive Outcomes in Sexual Minority and Majority Women with Endometriosis (study proposal)
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13:50	**Closing Remarks |** Dr. Maria Velez

Zoom Links

James A Low Research Day - Main Room & Poster Session Room 1
Join Zoom Meeting
https://queensu.zoom.us/j/91520169545?pwd=Sy94Y2paZDFwL01MTkhUdlpzYnliQT09
Meeting ID: 915 2016 9545
Passcode: 131785
Find your local number: https://queensu.zoom.us/u/acskEBabNC

James A Low Research Day - Poster Session Room 2
Join Zoom Meeting
https://queensu.zoom.us/j/95575090984?pwd=aitzVWtPRWV6aHc1TU5xVENRSVhtUT09
Meeting ID: 955 7509 0984
Passcode: 863698
Find your local number: https://queensu.zoom.us/u/aeowLTJDhI

Queen's University is situated on the territory of the Haudenosaunee and Anishinaabek.

Ne Queen's University e'tho noṅwe nikanónhsote tsi noṅwe ne Haudenosaunee tánon Anishinaabek tehatihsnónhsahere ne óhontsa.

Gimaakwe Gchi-gkinoomaagegamig atemagad Naadowe miinwaa Anishinaabe aking.

To acknowledge this traditional territory is to recognize its longer history, one predating the establishment of the earliest European colonies. It is also to acknowledge this territory's significance for the Indigenous Peoples who lived, and continue to live, upon it and whose practices and spiritualities were tied to the land and continue to develop in relationship to the territory and its other inhabitants today.

Keynote Speaker

Darine El-Chaar, MD, FRCSC, Msc

Medical staff – Division Maternal-Fetal Medicine, Department of Obstetrics, Gynecology & Newborn Care, The Ottawa Hospital
Assistant Professor – Faculty of Medicine, uOttawa
Assistant Professor – School of Epidemiology Public Health & Prevention Medicine, uOttawa
Associate Scientist – Omni Research Group
Clinical Epidemiology Program – Ottawa Hospital Research Institute
Dr. El-Chaâr is Co-lead of the COPE Network, setup in response to COVID-19 pandemic

Darine completed her Obstetrical and Gynecology residency at The Ottawa Hospital in 2012. In July of 2014, Darine El-Chaâr completed her Maternal Fetal Medicine fellowship training at the University of Toronto. Darine maintained a keen interest in obstetrical research and its impact on women's health. Darine joined the Maternal Fetal Medicine Department at The Ottawa Hospital as of July 2014. She has completed a Master's in Clinical Epidemiology from the Harvard T.H. Chan School of Public Health in 2017.

In 2020, she was awarded a Junior Research Chair in Perinatal Research and Epidemiology from the University of Ottawa. Her research program has some current focus areas: (1) breastfeeding and diabetes: initiation, success and maintenance; (2) Maternal morbidities and prenatal care; and (3) COVID-19 in pregnancy (4) Cannabis use in pregnancy. She has secured funding through CIHR and other grant funding agencies as both a principal investigator and a collaborator. She has had the opportunity to present some of her research at international conferences such as SMFM, ISUOG, SGI, CNPRM and SOGC.

THE COPE NETWORK

In collaboration with a network of 13 obstetrical hospitals in 6 of Ontario's largest cities we are generating complete infection and antibody profiles of maternal and newborn tissues to assess the mother-to-infant transmission potential of SARS-CoV-2 among mothers with confirmed or suspected COVID-19. With these data, we will compile in-depth obstetrical profiles of pregnancies affected by COVID-19 to assess clinical characteristics, transmission patterns and maternal and neonatal outcomes associated with infection.

Objectives for the Keynote Address:

- Identify the health system and patient-level impacts of COVID-19 in pregnancy
- Describe the latest evidence on the uptake and safety of COVID-19 vaccines in the obstetrical population
- Describe the evolution of research on COVID-19 and COVID-19 vaccines in pregnancy
- Describe how health administrative datasets and cohorts in Ontario are being used to address knowledge gaps in this field of research

Abstracts

Oral Presentations

O1. Reproductive health needs in female adolescent and young adult survivors of Hodgkin's lymphoma cancer

Susan Luong[1] (R4), Jessica Pudwell[1], Chad McClintock[2], Jill Dudebout[3], Maria P. Velez[1,2]

[1]Dept OBGYN, Queen's University, Kingston Health Sciences Centre, Kingston, ON, Canada; [2]ICES Queen's, Kingston, ON, Canada; [3]Dept Medicine, Queen's University, Kingston, ON, Canada

OBJECTIVES: To examine the effects of cancer treatment on reproductive health in female adolescent and young adult (AYA) Hodgkin's Lymphoma cancer survivors, using a population-based approach in Ontario, Canada from 1995-2014.

METHODS: We conducted a retrospective, population-based, matched-cohort study of female patients with Hodgkin's Lymphoma diagnosed at 15-39 years of age. Three female individuals with no history of cancer were matched by birth year and census subdivision. Treatment exposures were considered as chemotherapy, radiation, and combined modality. Reproductive health outcomes were infertility, childbirth, primary ovarian insufficiency (POI) and early menopause at ≥12 months of cancer diagnosis. Relative risks (aRR) were calculated using modified Poisson regression adjusted for income quintile, immigration status, and parity.

RESULTS: 1,443 exposed and 4,329 unexposed patients formed our cohort. Hodgkin's Lymphoma patients were at an increased risk of infertility (aRR 1.86; 95% CI 1.57-2.20). When considering treatment exposure, all groups experienced increased risk of infertility. No differences in childbirth rates were observed, overall or by treatment exposure. Hodgkin's Lymphoma patients were at an increased risk of POI (aRR 2.81; 95% CI 2.16-3.65) and early menopause (aRR 2.47; 95% CI 1.98-3.08). All groups experienced similar increased risks of POI and early menopause, independent of treatment exposure.

CONCLUSION: All young Hodgkin's Lymphoma survivors face an increased risk of infertility, POI and early menopause relative to women without cancer. These results emphasize the importance of pre-treatment fertility counselling and reproductive health surveillance for AYAs diagnosed with Hodgkin's Lymphoma.

O2. "We didn't always think or feel this way about ourselves": How the surgical work and learning environment lead to Impostor Phenomenon and the ways in which female surgeons negotiate it

Jennifer McCall (R4), Afra Mehwish (Ph.D. Candidate), Zoe Hutchison (R1), Jessica Pudwell, Jamie S. Pyper, Romy Nitsch

OBJECTIVES: To characterize Impostor Phenomenon (IP) among female surgeons, explore the manifestations of IP on their practices, and learn how they manage or resolve IP.

METHODS: Female-identified people in Canada who have completed a surgical residency were invited to complete an anonymous online survey from September 2020 to February 2021. The Mixed Methods design using constant comparative analysis on the open-ended questions provided thematic results.

RESULTS: 387 persons completed the survey. Regarding the nature and impact of IP: 1) the work and learning environment have a major influence over the development of IP, 2) setbacks, transitions, and steppingstones are common triggers for IP, and 3) IP has an impact on career development, health, and home life requiring concerted effort to negotiate its effects. Surgeons identified that IP can be negotiated in the following ways: 1) strong, supportive leadership and female representation are key to changing the dynamic of the workplace, 2) female surgeons are resilient and - with time - often find ways to co-exist with or overcome IP, and 3) well-constructed feedback is a critical element to the effacement of IP, especially self-feedback and objective measures if the surgeon can integrate these successes into their sense of self and achievement.

CONCLUSION: IP has lasting impacts on surgeon well-being. The surgical work environment has a major influence over the development of IP and should be a target for improvement. Training is a time of high risk for onset of IP and well-constructed feedback can strongly mitigate this potential trigger.

FUNDING: PSI

O3. Prescribing Practices of Antihypertensive Medication and Postpartum Management in Patients with Hypertensive Disorders of Pregnancy

Naomi Wedel (Meds 2023), Jessica Pudwell, Graeme N Smith

Dept OBGYN, Queen's University, Kingston Health Sciences Centre, Kingston, ON, Canada

OBJECTIVES: Understand current practices for the prescription of antihypertensive medications and postpartum management for patients with a history of hypertensive disorder of pregnancy (HDP).

METHODS: Retrospective cohort study including deliveries at Kingston Health Sciences Centre at ≥20 weeks gestation from January 1st, 2019, to April 30th, 2021, with a diagnosis of HDP (excluding pre-existing essential hypertension, diabetes, or autoimmune conditions). Obtained data from the BORN Ontario database, from patient charts, and from the Maternal Health Clinic (MHC) database. Three sub-cohorts: those discharged from hospital ±medication, those followed by obstetrical internal medicine (OB-IM) and those seen in the MHC at 6-months postpartum. For each encounter collected: time postpartum, provider, prescription, and blood pressure (BP).

RESULTS: Of 4276 deliveries, 336 were included. Sixty-seven patients were discharged from hospital with a prescription. Postpartum, 153/336 patients required follow up and 62% required prescription. OB-IM followed 85/153 patients. Patients discharged with medication and those followed by OB-IM had multiple indicators of increased severity of condition associated with close-monitoring of BP and prescriptions: higher discharge BP ($p<0.001$), more required follow up ($p<0.001$) and for multiple visits ($p<0.001$), more required prescriptions ($p<0.001$) and required >1 medication ($p=0.005$, $p=0.011$). At the MHC, 74/153 patients were seen and 9.5% were still on medication. For the entire cohort: average BP at discontinuation of medication was 119.4 ± 11.3/76.5 ± 7.9 and median length of follow up was 169 days [IQR 39-201.5].

CONCLUSION: These findings highlight the current burden on the healthcare system when it comes to postpartum management of patients with HDP; patients are requiring multiple encounters postpartum with specialized services in addition to accessing emergent care, many are requiring prescriptions either at discharge or within the immediate postpartum window and certain patient groups required a greater degree of monitoring of BP and prescriptions.

These results support further investigations looking closer at the efficacy of close-monitoring of blood pressure within the first 6-months postpartum window compared to postnatal self-management and which groups would benefit most from each approach. Evidence is needed from randomised clinical trials, to support clinical decision making and policy on clinical follow-up for women with a history of HDP.

O4. The Effect of the COVID-19 Pandemic on Monthly Trends in Adolescent Conception in Kingston, ON

Wafa Khoja (Meds 2024), Jessica Pudwell, Ashley Waddington

Dept OBGYN, Queen's University, Kingston Health Sciences Centre, Kingston, ON, Canada

OBJECTIVES: Knowledge of trends in adolescent conception rates can aid in delivery of targeted contraceptive and prenatal resources. Conception rates during the COVID-19 pandemic years (2020-2021) are compared to pre-pandemic years (2016-2019) in Kingston, ON.

METHODS: Patients aged ≤19 at estimated date of conception between 2016-2021 who were seen for a pregnancy related visit at Kingston Health Sciences Centre were included. Pregnancies that ended <20 weeks gestational age (GA) were captured using ICD-10 procedure codes for pregnancy loss or termination. Data for births that occurred ≥20 weeks GA were obtained from the BORN database. Month and year of conception were calculated using chart review based on diagnostic imaging reports or provider estimates of GA.

RESULTS: To date, 728 adolescent conceptions have been captured between January 1st, 2016, and July 31st, 2020, with 53.7% of these pregnancies ending <20 weeks GA. Overall, there has been a decline in adolescent conception rates between January 2016-April 2020 (test for trend $p<0.001$). Contrary to published trends of peak adolescent conceptions in March 2004-2008, mean conceptions were highest in January (mean=13.5±2.4) during 2016-2019.

CONCLUSION: Conception rates in Kingston's adolescent population are decreasing. Further, current monthly conception rates differ from previously established trends and provide opportunity to deliver targeted contraceptive and prenatal resources. Data collection will continue until September 2022 and will be correlated with governmental COVID-19 lockdowns to determine if conception rates were affected by public health measures during the pandemic.

O5. Management of Women with type 2B von Willebrand Disease During Pregnancy and Postpartum: Evidence from Literature, Data from ISTH Registry and an International Survey- Communication from ISTH SSCs on VWF and Women's Health

Abdelrahman Noureldin (BHSc 2023),[1] Predrag Miljic[2], Michelle Lavin[3], Sajida Kazi[4], Analia Sanchez Luceros[5], Paula D James[6], Maha Othman (PI)[1,7]

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[6]*Department of Medicine, Division of Hematology, Queens's University, Kingston, ON, Canada*
[7]*School of Baccalaureate Nursing, St. Lawrence College, Kingston, ON, Canada*

Management of women with 2B VWD during pregnancy is challenging due to the associated physiological haemostatic alterations. The best approaches for lab monitoring, choice and goals of therapy remain ill-defined. Given the rarity of the condition, we aimed to examine current diagnostic and management approaches and outcomes of women with this disease during pregnancy via three avenues: 1-systematic review of literature, 2-an international registry supported by the International Society on Thrombosis and Haemostasis (ISTH) and 3-an international survey on physicians' practices on the management of pregnancy for women with VWD. A total of 55 pregnancies from across the globe (literature: 35, registry: 20) as well as data reported by 112 physicians were analyzed. We found that genetic testing confirmed diagnosis in only 28 (50.9%) pregnancies. The majority of reports included bleeding symptoms with no objective bleeding scores. Platelet count decreased significantly (p=0.0003) and VWF:RCo levels increased significantly (p=0.003) in third trimester compared to baseline levels with no changes in VWF Act/ Ag ratio. Post-partum hemorrhage was reported in 17 (30.9%) patients and that 38.7% of all women who received any sort of VWF replacement and 30% of those with platelet transfusion developed postpartum hemorrhage. Reported treatment varied between VWF/FVIII, VWF concentrate replacement, platelet transfusion, and antifibrinolytic therapy with substantial variation in the timing and duration of treatment and inconsistency in regimens. 43% of patients received treatment during or after labor with little/no haemostasias monitoring reported. This study reports the highest number of pregnant women with type 2BVWD so far. The data indicates management practices are diverse, bleeding complications remains a concern in this group, target safe VWF level and the best monitoring approach are unknown, and timing of VWF replacement and the use of other therapy protocols needs to be standardized. An international consensus and guidance are critically needed for better care of this cohort.

Funding: International Society of Thrombosis and Hemostasis (ISTH), Canadian Hemophilia Society (CHS)

06. Varying estimation of Infertility in Ethiopia: the need for a comprehensive definition

Bilen Mekonnen Araya (PhD candidate),[a] Heather M. Aldersey,[a] Saionara Camara,[b] Maria P. Velez.[b]

Departments of [a]Rehabilitation Science & [b]Obstetrics and Gynecology, Queen's University.

OBJECTIVES: Infertility – the inability to conceive – is a marginalized sexual and reproductive health issue in low resource settings. Globally, millions are affected by the condition, but the lack of a universal indicator of infertility has made it difficult to have an accurate estimation at the population level. According to the World Health Organization (2022), infertility is also considered a public health issue as it affects over 10% of women globally using a five-year frame or more and the estimates become 2.5 times larger when using a two-year time frame. The prevalence of global infertility is difficult to determine due to the influence of both male and female factors and the units of analysis – women, men, couple, or both – are often used interchangeably or without precision. Population-based surveys show that primary infertility ranges from 0.6 to 49.91, while secondary infertility is estimated at 4.8 to 49.79. Determining infertility estimates are necessary to target the prevention and treatment efforts of infertility. Estimating infertility helps to deliver targeted interventions (e.g., medical and rehabilitation services) by the health care system and policymakers, especially for a resource-limited country such as Ethiopia. This study aims to examine the changes in the estimate of infertility among women in Ethiopia using two different approaches: the DHS and the current duration approach.

METHODS: The Ethiopian Demographic and Health Survey 2016 data were used with a sample size of 15,683 women. The DHS approach estimates infertility among women who have been married/in a union for at least 5 years, not using contraceptives, and have a fertility desire. The current duration approach includes women who are 'at risk' of pregnancy at the time of the survey and calculates the time to pregnancy at 12, 24, and 36 months. We used logistic regression analysis to determine the prevalence of infertility using the DHS definition and factors associated, and parametric survival analysis to determine the prevalence of infertility using the current duration approach (time to pregnancy). All estimates used sampling weights to account for the complex survey design. STATA 14 and R were used to perform the statistical analysis.

RESULTS: Using the DHS definition, the prevalence of infertility was 7.6% (95% CI 6.6-8.8). When stratified as primary or secondary infertility, the prevalence was 1.4% (95% CI 1.0-1.9) and 8.7% (95% CI 7.5-10.1), respectively. Women's age, wealth index, number of children, age at first cohabitation, body mass index, smoking, and partner's work status were significantly associated with infertility. Using the current duration approach definition, the prevalence of infertility was 24.1% (95% CI 18.8-34.0) at 12-months, 13.4% (95% CI 10.1-18.6) at 24-months, and 8.8% (95% CI 6.5-12.3) at 36-months. When classified as primary infertility, the prevalence was 10.4% (95% CI 4.1-26.1) at 12-months, 5.4% (95% CI 1.9-13.5) at 24-months, and 3.6% (95% CI 1.2- 9.0) at 36-months. As for secondary infertility, the prevalence was 27.1% (95% CI 20.2- 39.4) at 12-months, 15.1% (95% CI 10.8- 21.5) at 24-months, and 9.8% (95% CI 7.0-14.0) at 36- months. In addition, we performed stratified analysis by variables found to be statistically different among nulliparous and parous women.

CONCLUSION: The DHS definition of infertility underestimates the prevalence of infertility as it uses five years time frame. The current duration approach definition is more appropriate for the early detection and management of infertility in Ethiopia. Population-based surveys like DHS should incorporate direct questions related to infertility to facilitate epidemiological surveillance.

O7. The Role of IL23 and the IL23/TH17 Axis in the Pathophysiology of Endometriosis

Danielle J. Sisnett (PhD Candidate)[1], Jessica E. Miller (PhD)[1], Katherine B. Zutautas (PhD Candidate)[1], Harshavardhan Lingegowda (PhD Candidate)[1], Olga Bougie (MPH, MD)[2], Bruce A. Lessey (PhD, MD)[3], Madhuri Koti (PhD)[1,2] and Chandrakant Tayade (DVM, PhD)[1]

[1]Queen's University, Dept of Biomedical and Molecular Sciences, Kingston, ON, CA; [2]Kingston General Hospital, Kingston, ON, CA; [3]Wake Forest Baptist Health, Winston-Salem, NC, USA

OBJECTIVES: Immune dysfunction is central to endometriosis (EM) pathogenesis, but the exact mechanisms are unclear. The IL23/IL17 axis plays a key role in pathogenic dysregulation of the T helper(T_H)17 pathway in various inflammatory/autoimmune diseases. Though this has yet to be explored in EM pathology. We hypothesize that endometriotic lesions are a source of IL23 and IL23 in turn plays a crucial role in evoking and maintaining a "pathogenic" profile in T_H17 cells, producing IL17, contributing to EM pathophysiology.

Aim 1: *Establish RNA/protein expression of IL-23 and other key mediators in the IL-23/T_H17 axis in EM patient samples.*
Aim 2: *Discover how human cell lines representative of the EM microenvironment individually respond to IL-23 treatment*.
Aim 3: *Determine the role of IL-23/ T_H17 cells in EM pathophysiology using our mouse model of EM.*

METHODS: *Located at Queen's University, Kingston ON*. Targeted qPCR was conducted in human EM patient eutopic (n=8)/ectopic (n=9) tissues and healthy endometrial samples (n=9) to quantify key gene expression in the IL23/T_H17 axis. To understand the impact of IL23 on cells representative of the EM microenvironment, human 12Z, EECC, HUVECs, and primary T cells were treated with rIL23 and analyzed for cytokine production (multiplex cytokine array). Human $CD4^+$ T cells isolated from peripheral blood were treated with rIL23 and analyzed via flow cytometry for T_H17/T regulatory (T_{REG}) cells. To further assess the causal role of IL23 and its influence on the T_H17 pathway, we induced EM in C57BL/6 mice (n=12) or sham controls (n=12). Mice in each group were treated with 1ug rIL23 (n=6), or PBS (controls; n=6), via intraperitoneal injections 3 times/week for 3 weeks. Relevant cytokines in IL23/T_H17 axis were measured in peritoneal fluid and plasma via multiplex cytokine array. Peritoneal fluid and splenocytes will be evaluated for T_H17/T_{REG} cells via flow cytometry. Immunohistochemistry will be conducted on murine lesions to evaluate IL17 and T_H17/T_{REG} cells.

RESULTS: qPCR revealed dysregulated expression of key genes in the IL23/T_H17 axis in patient samples. IL17A/F and IL23R were significantly increased by 6-fold in EM lesions compared to controls (p=0.001). IL23R (p=0.045) and IL23 p19/p40 subunit expression were also upregulated in patient eutopic tissues compared to controls. *In vitro* rIL23 stimulation significantly influenced the secretion of various cytokines known to establish lesions. Ongoing work reveals EM mice treated with rIL23 have significantly increased peritoneal fluid cells compared to controls (p=0.008). Rest of analysis is in progress.

CONCLUSION: Our results suggest dysregulation of key genes in the IL23/T_H17 axis at EM lesion level, proposing lesions as a potential source of these factors. IL23 influence on differential cytokine production from EM representative cell lines further supports notion that IL23 potentiates EM associated inflammation. Mechanistic studies in our mouse model will reveal how/whether IL23 contributes to pathogenic T_H17 cell expansion and or directly affects EM lesion initiation and growth. This work will reveal future potential therapeutic targeting of IL23/T_H17 axis in EM.

O8. Dysregulation of Leukemia Inhibitory Factor; Implications for Endometriosis Pathophysiology

Katie B. Zutautas (PhD Candidate), Danielle J. Sisnett, Jessica E. Miller, Harshavardan Lingegowda, Timothy Childs, Bruce A. Lessey, Madhuri Koti, Chandra Tayade

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INTRODUCTION: Endometriosis (EM), a chronic estrogen dependant inflammatory condition, remains to be understood from a pathophysiological perspective. A novel target that may contribute to disease progression is Leukemia Inhibitory Factor (LIF). LIF is responsible for successful implantation, facilitating decidualization and immune modulation within the endometrium. To date, LIF has only been studied in EM within the context of infertility. However, LIFs capacity to influence cellular changes as well as its immunomodulatory effects, make it an attractive player for study in EM pathophysiology. We hypothesize that LIF will maintain ectopic tissues by promoting cell proliferation, vascularization, as well as modulating immune phenotypes within the microenvironment through macrophage polarization and Treg stimulation.

METHODS: To quantify ectopic LIF, a tissue microarray (TMA) of eutopic and ectopic tissues (EM patients) and matched healthy endometria (controls) were stained for LIF using IHC. To understand the role of LIF family members in the EM lesion microenvironment RT2 qPCR was conducted for LIF, its receptor (LIFR) and downstream targets in ectopic, matched eutopic and normal samples. To understand the influence of LIF on EM pathophysiology, endometriotic epithelial (12Z) and endothelial (HUVEC) cell lines were treated with varying LIF concentrations (1-200ng/mL) to determine effects on cell proliferation (WST-1), apoptosis (Caspase 3/7) and cytokine secretion. To gain mechanistic insight on heightened LIF on EM associated inflammation and lesion development a mouse model of EM (C57/Bl6) was used. Mice were treated daily for 13 days using recombinant mouse LIF (300ng/100uL) and PBS (control) via intraperitoneal injection with blood samples collected on days 1, 7 and 14. Peritoneal fluid and spleen cells were harvested and processed with flow cytometry for myeloid and lymphoid markers. Plasma and peritoneal fluid were screened for inflammatory and angiogenic markers using multiplex analysis.

RESULTS: Preliminary results demonstrate a dysregulation of LIF across eutopic and ectopic sites. Significant downregulation ($p<0.01$) of LIF in eutopic EM tissues compared to controls was identified in the TMA. Transcript levels of LIF were significantly downregulated ($p<0.05$) while LIFR showed a two-fold upregulation of expression, when comparing ectopic and eutopic EM samples. At this time, remaining mouse and cell culture analysis are in progress.

CONCLUSION: Our study for the first time provides evidence that EM lesions express LIF and that the dysregulation in LIF/LIFR in the lesion microenvironment might play a role in EM lesion sustainment. Mechanistic studies in our EM mouse model will shed light on the potential causal role of LIF and associated members within EM pathophysiology.

O9. Sca-1 positive cells in the trophoblast stem cell niche and throughout placental development

Megan Cull[1] (MSc Candidate), Bryony Natale[2], Nicole Peterson[2], Avery McGinnis[1], David Natale[1,2].

[1]Dept. of Biomedical and Molecular Sciences, Queen's University; [2]Dept. of Obstetrics and Gynecology, Queen's University.

OBJECTIVES: Stem cell antigen-1 (Sca-1) is a cell surface marker commonly used to enrich for adult mouse stem and progenitor cells. Sca-1 mRNA and protein are highly expressed in cultured mouse trophoblast stem (TS) cells and Sca-1 allows for the isolation of proliferative, multipotent mouse trophoblast (TB) cells that persist into the mid-gestation placenta. **I hypothesize that Sca-1 identifies a unique subpopulation of TS cells and that Sca-1 positive TB will contribute to the labyrinth and junctional zone of the placenta.** This hypothesis was tested through the complementary objectives: **1)** a mouse TS cell culture model to determine whether Sca-1 identified a phenotypically unique subpopulation of TS cells *in vitro* and **2)** a transgenic mouse model to conduct lineage tracing and fate-mapping studies of Sca-1 *in vivo*.

METHODS: 1) Proliferating TS cells were sorted into Sca-1 positive (POS) and negative (NEG) subpopulations by fluorescence-activated cell sorting (FACS) and plated in triplicates in hypoxia (1% O_2) and a normoxia (ambient air) control. A serial passage study evaluated proliferation rate to establish both subpopulations' self-maintenance ability and their original RNA profile. TS and TB progenitor genes relative mRNA expression was assessed by qRT-PCR, with reactions conducted in triplicate on cDNA representing three independent experimental replicates for each gene. Sca-1 surface protein expression was quantified by flow cytometry. **2)** Tamoxifen inducible Sca-1 Cre mice were crossed with Ai6 reporter mice such that all Sca-1 cells and their progeny permanently expressed ZsGreen1, an enhanced green fluorescent protein. Placentae were collected at embryonic day (ED)12.5 and assessed using fluorescent microscopy and immunofluorescence. Endogenous GFP was colocalized to TB-specific antibodies using histological analysis to elucidate the placental contribution of Sca-1^{POS} TS cells and their daughter cells, and their spatial and temporal location.

RESULTS: Sca-$1^{POS/NEG}$ subpopulations isolated from proliferating culture conditions both express TS cell and progenitor genes. Both subpopulations can be passaged indefinitely in hypoxic and normoxic conditions, without significant difference ($p \geq 0.05$) in their growth after 3 days in culture. After 48 hours in culture, neither the Sca-1^{POS} or Sca-1^{NEG} culture was homogeneous with an 88:12 ratio of POS to NEG cells in the Sca-1^{POS} population, and a 51:49 ratio in the Sca-1^{NEG} population, with oxygen concentration not impacting the ratio of surface protein expression of Sca-1. In healthy placentation, new Sca-1^{POS} cells were activated between ED7.5-11.5. Colocalization of endogenous fluorescence identified endothelial and trophoblast cells of Sca-1 lineage. Specifically, Sca-1^{POS} trophoblast cells and their progeny were present in both the labyrinth and junctional zone of the placenta.

CONCLUSION: While the Sca-1^{NEG} subpopulation can be passaged indefinitely *in vitro*, it is interesting that the population became Sca-$1^{POS/NEG}$ heterogeneous. Because the Sca-1^{NEG} subpopulations were depleted of Sca-1^{POS} cells, we can conclude that Sca-1 was turned on in this population. This supports further investigation into the functional role of Sca-1 and the plasticity of TS cells. *In vivo* lineage tracing of Sca-1 cells identified that they have the capacity to give rise to TB of both the junctional zone and the labyrinth. These findings are highly relevant as TS cells may offer a target to treat placental pathologies in the future.

FUNDING: NIH/NICHD

O10. The Impact of Sex on D-Dimer Levels and Disease Outcomes in Hospitalized COVID-19 Patients: A Systematic Review and Meta-analysis

Olivia Saville (BSc 2022), Yousra Tera (Post Doc), Malak Elbatarny (R3, PhD candidate), Yan Deng (RA), Maha Othman (PI)

OBJECTIVES: Males and females are similarly susceptible to COVID-19 infection. Multiple studies report male mortality rate to be nearly double that of females. Hypercoagulability is common in severe COVID-19 patients. D-dimer was reported as a significant marker for disease severity and mortality risk. It is unclear whether D-dimer levels differ between males and females and the effect of D-dimer levels on disease outcomes remains under investigation. Thus, we aimed to evaluate the sex difference of D-dimer level among hospitalized COVID-19 patients and determine the effect of sex and D-dimer level on disease outcomes.

METHODS: We searched EMBASE for articles published prior to October 1, 2021, evaluating D-dimer in adult males and females hospitalized for COVID-19 and reporting on their mortality, ICU admission, hospital stay and thrombotic complications. 3225 articles were retrieved. Comparative, observational prospective or retrospective, or case control studies were included. Studies including pregnancy, children, or secondary disease focus were excluded. We meta-analysed data from 10 included studies using Cochrane RevMan 5 software.

RESULTS: Of 11827 hospitalized COVID-19+ adults from 10 included studies, 6519 (55%) were male and 5308 (45%) were female. Critical illness was experienced by 1681 (26%) males and 1228 (23%) females. Mortality occurred in 877 (13%) males and 548 (10%) females. In unadjusted meta-analysis, males had significantly higher odds of experiencing critical illness 1.53 [95% CI: 1.36-1.72, I2 =77%, P= <0.00001] and mortality 1.40 [95% CI: 1.24-1.57, I2=0%, P= <0.00001]. The mean D-dimer level was also significantly higher among males vs. females (0.18 [95% CI: 0.13-0.23, I2=83%, P= < 0.00001]). In subgroup analysis the magnitude of effect size was greater at lower D-dimer levels compared to higher D-dimer levels for odds of critical illness (2.31 [95% CI=1.73-2.63, I2=0%, P= <0.00001] vs. 1.36 [95% CI: 1.13-1.63, I2=70%, P=0.001]) and odds of mortality (1.51 [95% CI: 1.25-1.83, I2=56%, P= <0.0001] vs. 1.39 [95% CI: 1.15-1.67, I2=0%, P=0.0007]). The subgroup difference was statistically significant for odds of critical illness (P=0.001), but not significant for odds of mortality (P=0.52). The reporting of D-dimer assay calibration was inconsistent and D-dimer unit magnitude varied greatly between studies.

CONCLUSION: Males have higher mean D-dimer levels and are at higher risk of experiencing poor COVID-19 outcomes than females. The sex effect, in favour of females, for experiencing critical COVID-19 illness is greater at lower levels of D-dimer. These findings may have implications in D-dimer testing for patient outcome prognosis, which may help guide sex-based assessment and prediction of outcomes. Additionally, the diversity in D-dimer reporting impacts data interpretation and requires further investigation and attention.

O11. Population and diagnostic characteristics of patients diagnosed with gestational diabetes mellitus before and during the COVID-19 pandemic

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OBJECTIVES: Our study aimed to analyze differences in risk factors for developing gestational diabetes mellitus (GDM) and examine changes in diagnostic testing between pre-pandemic and pandemic cohorts.

METHODS: We undertook a retrospective assessment of patients with GDM who delivered at ≥20 weeks' gestation between January 1st, 2018 and April 30th, 2021 at Kingston Health Sciences Centre. The study cohort included 361 patients: 252 pre-pandemic and 109 during the pandemic. Patient demographics and pregnancy and birth outcomes were obtained from the BORN Ontario database and through patient charts. Patients diagnosed before March 13th, 2020 (the pre-pandemic group) were compared to those diagnosed thereafter (the pandemic group) through t-tests, chi-squared tests, and Mann-Whitney U tests using IBM SPSS Statistics.

RESULTS: The pandemic group had lower rates of previous macrosomia (6.5% vs 14.5%, p=0.036). While statistically insignificant, the pandemic group appeared to have fewer previous GDM diagnoses (14.3% vs 20.3%, p=0.18) and lower mean pre-pregnancy BMIs (29.6 [27.0-38.1] vs 32.7 [25.9-38.0], p=0.11). Both groups were mostly diagnosed using two contingent tests, with GCT and OGTT being the most common. The pandemic group was more likely to be diagnosed within the standard 24-28 week timeframe (78.8% vs 63.0%, P = 0.036).

CONCLUSION: Our findings suggest there may be a clinically significant decrease in frequency of traditional GDM risk factors in pandemic cohorts. It remains uncertain whether these differences are because of changing patient or testing characteristics or differing lifestyles during the pandemic. Future research using larger cohorts is warranted to further elucidate these findings.

O12. Elective induction of labour at 39 weeks compared with expectant management in nulliparous women delivering in a community hospital: A quality improvement study

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OBJECTIVES: To evaluate the impact of offering elective labour induction at 39 weeks of gestation in nulliparous women with low-risk pregnancies on perinatal and maternal outcomes of labour.

METHODS: The charts of all pregnant women seen at Brockville General Hospital between September 2018 and December 2021 were retrospectively reviewed using the Better Outcomes Registry Network (BORN) Ontario Database. The perinatal and maternal outcomes of low-risk nulliparous pregnant women who underwent elective labour induction at 39 weeks were extracted and compared with low-risk nulliparous pregnant women who underwent expectant management. Exclusion criteria included multiparous women, high-risk pregnancies, multiple gestations, deliveries at less than 39 weeks of gestation, and elective caesarean deliveries. Univariate and multivariate analysis was performed.

RESULTS: A total of 174 patients were included. Of these patients, 56 (32.2%) underwent elective induction of labour at 39 weeks, whereas 118 (67.8%) were expectantly managed at 39 weeks of gestation and beyond. Compared to expectant management, those induced at 39 weeks had a significantly lower risk of caesarean delivery (odds ratio [OR], 0.39; 95% confidence interval [CI], 0.15-0.99) and composite adverse maternal outcomes (OR, 0.34; 95% CI, 0.12-0.97).

CONCLUSION: Our results suggest that elective induction of labour at 39 weeks in low-risk nulliparous women is associated with a lower risk of caesarean delivery and composite adverse maternal outcomes compared with expectant management.

O13. Symptoms of Colorectal Pelvic Floor Dysfunction in Women following OASIS: A survey study comparing OASIS to control subjects adjusting for parity

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BACKGROUND: Obstetrical anal sphincter injuries (OASIS) occur in 4-6.6% of vaginal deliveries. They are associated with both short and long-term maternal morbidity, including defecation problems in the immediate postpartum period and long-term anal incontinence. Some studies have examined whether subsequent pregnancy, and mode of delivery, following OASIS affect anal incontinence symptoms, however the evidence is mixed, making it difficult for obstetrical providers to counsel their patients.

OBJECTIVES: The current study aimed to compare symptoms in those women with a history of OASIS who had subsequent vaginal deliveries to those with OASIS who did not have further vaginal deliveries, as well as to those women without OASIS, who either remained primiparous or went on to have subsequent vaginal deliveries.

METHODS: Ethics approval (OBGY-245-13) was obtained from the Queen's University and Affiliated Teaching Hospitals Health Sciences Research Ethics Board. Mail-out surveys which included demographics, Wexner score, CRADI8, Manchester General Health and Incontinence Impact Score, were sent to 247 women who suffered an OASIS at their first delivery between 2007-2012. Since the rate of anal incontinence in women who do not suffer OASIS is not well studied, for comparison, we sent the same questionnaires to 259 women who had vaginal deliveries during the same time frame, but who did not suffer OASIS. Exclusion criteria included multiple gestation, gross anatomic fetal anomalies, IUFD, GA < 37 weeks, and maternal age < 15 years at the time of delivery. To compare outcomes, t-test, Mann-Whitney-U and chi squared analyses were used. Logistic regression models were used to adjust for number of vaginal deliveries. Statistical analysis was completed using IBM SPSS statistics v27.

RESULTS: Survey response rate for OASIS and control groups were 36.8% (91/247) and 23.2% (60/259) respectively. During an in-depth chart review of those who returned surveys, we identified that hospital diagnostic codes did not consistently match hospital records. For this reason, 5 OASIS and 14 controls were excluded, and 5 controls were moved to the OASIS group. Within the OASIS cohort, 80 (88%) had a 3rd degree tear and 9 (10%) had a 4th degree tear. Women with OASIS had a longer mean (SD) active second stage (110 (61) vs 77 (57) minutes, p=0.01), a higher mean (SD) infant birth weight (3725g (446) vs 3499g (420), p=0.01), and were more likely to have had an operative vaginal delivery (57% vs 25%) (p=0.02). Women with OASIS were more likely to experience flatal incontinence (44% vs 18%) (aOR=3.74, 95% CI 1.41, 9.94; p=0.008), but there was no difference in frequency of fecal incontinence (11% vs 6%) (aOR=1.96, 95% CI 0.41, 9.64; p=0.41). There was a significant difference in symptom severity between the two groups, with significantly more women in the OASIS cohort above the median Manchester questionnaire score (aOR=3.16, 95% CI 1.24, 8.05; p=0.016). There was no statistical difference in the perception of impact of symptoms on quality of life. When adjusted for number of subsequent vaginal deliveries, these results remained true.

CONCLUSION: Within this study population, although women with a history of OASIS have more frequent flatal incontinence and more severe symptoms than those without a history of OASIS, this difference it does not translate to impact upon quality of life metrics.

O14. Qualitative assessment in the multi-stage development of a patient-reported outcome measure for genito-pelvic dyspareunia

Nisha Marshall (MSc Candidate), Samantha Levang, Heather Noga, A. Fuchsia Howard, Lori A. Brotto, Paul Yong, Caroline Pukall

INTRODUCTION: Dyspareunia affects between 8-22% of women worldwide and is a significant contributor to decreased sexual satisfaction and quality of life. Little is known about how deep versus superficial dyspareunia is conceptualized and communicated by patients compared to clinicians, which can lead to discrepant understandings of patient symptoms. The Deep and Superficial Dyspareunia Questionnaire (DSDQ) was created to capture the physical characteristics and psychosocial correlates of deep and superficial dyspareunia. Physical characteristic items assess the location, intensity, timing, and quality features of pain. Psychosocial items assess how pain affects one's behaviours, cognitions, affect and sexuality. Qualitative assessment is required to generate validity evidence for the DSDQ as a patient-reported outcome measure (PROM).

OBJECTIVES: The objective of this study was to make modifications to the DSDQ and assess its content and construct validity by conducting individual and group interviews with patients with lived experience of dyspareunia.

METHODS: This study followed the Patient-Reported Outcome Measure Information System (PROMIS) guidelines. Ten individual patient cognitive interviews and two focus groups with patients (n=3 and n=5 respectively) were conducted. Cognitive interviews assessed patient's cognitive appraisal of each item on the DSDQ. Focus groups prompted discussions regarding patient's overall appraisal of the DSDQ. Analysis of transcribed data followed a qualitative descriptive approach, using inductive and deductive coding techniques.

RESULTS: The DSDQ was perceived by patients to be patient-centered, sensitive to the dyspareunia experience, included items that comprehensively represented the domains of dyspareunia, and did not include irrelevant items. Items were also perceived to be understandable and appropriately formatted. However, the DSDQ was considered lengthy and emotionally and cognitively taxing to complete.

CONCLUSION: The DSDQ aims to phenotype genito-pelvic dyspareunia with respect to location and impact of pain. This qualitative study further refined the DSDQ and contributed to establishing its content and construct validity. Psychometric testing will be used in the future to generate validity and reliability evidence for this measure.

O15. Availability, Quality, and Implementability of Canadian Clinical Practice Guidelines for Female Sexual Dysfunction

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OBJECTIVES: Sexual health concerns are prevalent among Canadian women, though they often go undetected and unaddressed in clinical settings. Clinical practice guidelines (CPGs) include recommendations intended to optimize patient care for specific clinical circumstances. Their potential benefits to patients and practitioners are dependent upon rigorous CPG development processes and successful implementation into clinical practice. Little is known about the curation, availability, quality, and implementability of Canadian CPGs for women's sexual health problems and female sexual dysfunction (FSD). This study aims i) to determine the availability of protocols guiding the curation of Canadian CPGs and ii) to assess the availability, quality, and implementability of Canadian CPGs for women's sexual health concerns and FSD.

METHODS: A comprehensive search was conducted to retrieve publicly available documents referencing Canadian CPG development processes. Eligible records underwent full-text review focused on date of last update, scope, and qualitative content analysis. Using similar methodology, a separate search was conducted to retrieve Canadian CPGs specific to women's sexual health and FSD. Records that met specific eligibility criteria went on to subsequent analyses using validated CPG appraisal tools, AGREE-II and AGREE-REX, to assess CPG quality and implementability, respectively, and qualitative content analysis to identify the scope and thematic content of the CPGs.

RESULTS: Two national and three provincial protocols for Canadian CPG development were identified. These national and provincial documents were variable in their suggested methodologies for CPG curation and update. Six Canadian CPGs specific to women's sexual health and FSD were identified. However, only one by the Society of Obstetricians and Gynecologists of Canada (SOGC) met the required eligibility criteria and thus underwent subsequent analysis. The SOGC guideline scored highly with respect to Scope and Purpose (79%), and Clarity of Presentation (86%), though it did not sufficiently address the remaining AGREE-II domains, scoring lowest in Applicability (44%) and Editorial Independence (13%). AGREE-REX scoring was 58%, suggesting this CPG was moderately implementable. Qualitative analysis revealed a focus on the importance of healthcare providers ensuring they have the necessary skills and knowledge to assess and manage sexual health problems, though the details of these skills and knowledge were not consistently defined.

CONCLUSION: There is a lack of standardization over the process of CPG curation in Canada and only one Canadian CPG comprehensively guiding best practices for FSD. This study highlights the strengths and deficiencies in current Canadian CPGs for FSD. Canadian CPG developers should consider FSD a topic of priority and continue to make attempts to curate comprehensive, evidence-based CPGs in this field that are implementable in all Canadian contexts. The International Society for the Study of Women's Sexual Health Process of Care for the Identification of Sexual Concerns and Problems in Women may serve as a valuable resource in improving Canadian FSD CPGs.

O16. Examining Factors Associated with Adaptive Outcomes in Sexual Minority and Majority Women with Endometriosis (study proposal)

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OBJECTIVES: Current models utilized in the pain literature focus on risk factors contributing to the development of chronic pain and pain-related disability without considering factors that promote resilience and lead to adaptive outcomes; thus, treatments focusing on psychological factors in the endometriosis population are lacking. In addition, despite the well-known relationship between sexual health and quality of life, few studies have focused on the concept of sexual distress in the endometriosis population. Given the significant knowledge gaps related to adaptive outcomes in women with endometriosis, the proposed study aims to examine vulnerability and resilience factors contributing to sexual distress within a sample of women with endometriosis. It is hypothesized that: 1. Lower levels of sexual self-consciousness and higher levels of sexual flexibility will be associated with lower levels of sexual distress resulting from endometriosis. 2. Sexual minority women will report higher levels of sexual flexibility and lower levels of sexual distress associated with endometriosis as compared with sexual majority women.

METHODS: The proposed study will be conducted online to recruit a large, diverse sample of women with endometriosis. The proposed study will focus on self-identified women with a self-reported clinician-identified diagnosis of endometriosis. Inclusion criteria for the proposed study will include (1) identifying as a woman who is (2) 18 years of age or older, (2) fluent in reading and writing English, (3) currently in an intimate and/or romantic relationship with a partner or partners, and (4) has a clinician-identified diagnosis of endometriosis. All participants who satisfy the eligibility criteria will complete questions about sociodemographics and medical history, in addition to empirically-validated measures on resilience, sexual flexibility, pain self-efficacy, chronic pain acceptance, pain catastrophizing, sexual self-consciousness, pain anxiety, and sexual distress. In order to determine which factors predict adaptive outcomes related to lower levels of sexual distress, the proposed study will use a moderated multiple mediation model. The proposed sample size is 1,000 to achieve an adequate power level of .80.

RESULTS: Preliminary analyses will be conducted and results presented.

CONCLUSION: Since endometriosis was first identified over a century ago, there has been an increase in the number of reported cases of this condition. However, despite this increase, a lack of information regarding the pathogenesis, pathology, and progression of endometriosis remains. Moreover, interventions targeted at improving endometriosis symptoms and decreasing associated distress are lacking. Overall, there is a need for research that focuses on endometriosis and the contributing roles of vulnerability and resilience factors in sexual distress. As the first investigation of vulnerability and resilience factors associated with sexual distress as a result of endometriosis in a population inclusive of sexual minority women, the results of this proposed study will contribute significantly to clinical practice in terms of providing novel targets for psychotherapeutic treatment options. This innovative approach, in turn, can improve the psychological health, relationship satisfaction, and quality of life for women who experience sexual distress resulting from endometriosis.

O17. The Impact of The Female Urogenital Tract Microbiome Pre- and Post-LEEP on Sexual Dysfunction

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OBJECTIVES: The microbiome of the female urogenital tract (FUT), including the urethra, the vagina, and the cervix, is essential for maintaining a stable microenvironment. Due to the close anatomical relationship between regions of the FUT, it is possible that dysbiosis in one region because of disease, such as cervical dysplasia (CD), can impact other regions. Electrocautery of the cervix during the Loop Electrosurgical Excision Procedure (LEEP) effectively treats CD yet is known to alter the local microbiome. The impact of CD and its treatment (LEEP) on the FUT microbiomes has never been investigated. Given the potential for tissue damage from LEEP, it is likely that the FUT bacterial profile reflects a pro-inflammatory environment. Additionally, it is possible that persistent dysbiosis may be a mechanism of female sexual dysfunction (FSD), that has been reported in a subpopulation of post-LEEP patients, though this correlation has yet to be investigated. This study examined the FUT microbiome in patients with CD pre- and post-LEEP. It also evaluated the sexual function of patients pre-and post-LEEP using validated surveys and compared the survey responses to the patient microbial profiles.

METHODS: Twenty-five participants with CD undergoing LEEP were consented and recruited from the Colposcopy clinic at Kingston General Hospital. Vaginal swabs, cervical swabs, and urine samples were collected to examine the FUT microbiomes. All participants completed an online self-report survey including full FSFI pre-LEEP and three months post-LEEP. 16S rRNA analysis was performed to determine the presence and relative abundance of bacteria in the samples. Qualitative and statistical analyses were performed on survey responses using NVivo 12 and SPSS, respectively.

RESULTS: This study found that the relative abundance of Prevotella in participants with CD pre-LEEP was significantly increased ($p = <0.001$) in only the cervical microbiome. This showed that the cervix had a unique bacterial profile when compared to the vagina, though existing studies often examine them together. There was a further significant increase ($p = 0.0186$) in Prevotella in the cervical microbiome of participants post-LEEP versus pre-LEEP. The findings suggest that on average, patients with CD have a cervical microbiome in dysbiosis. This study also identified a subset of participants with decreased sexual function post-LEEP and correlative microbiome dysbiosis. Further bacterial analysis regarding these profiles is ongoing.

CONCLUSION: This study showed that patients with CD have a cervical microbiome in dysbiosis, that does not induce dysbiosis in the vaginal or urethral microbiome. It also showed that CD patients may have persistent inflammation post-LEEP, which could result in FSD as detected by self-report surveys. Information gained from characteristic FUT bacterial profiles may be translated into therapies to regulate the microbiome pre- and post-LEEP and may indicate that the microenvironment of the FUT can be optimised to facilitate healing following procedures.

FUNDING: Funded by the 2021 ISSWSH Scholars in Women's Sexual Health Research Grant Program.

Abstracts

Poster Presentations

P1. Localization of Cannabinoid Receptors in the Mouse Placenta

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OBJECTIVE: Exposure to ingredients in cannabis has been evidenced to contribute to placental dysfunction and labyrinth-specific vascular defects of the rodent placenta, this model serving as a functional analogue of human placentae. An imperative need remains to elucidate the mechanism by which exposure to exogenous cannabinoids contributes to placental dysfunction, which receptors within the placenta are potential cannabinoid targets, and their localization. My research project aims to characterize the spatial and temporal expression of cannabinoid receptors 1 and 2 (CNR1 and CNR2) and other well-characterized molecular targets of cannabinoids, including the transient receptor potential vanilloid 1 (TRPV1), the peroxisome proliferator-activated receptor gamma (PPARg), and g-coupled protein receptor 55 (GPR55) within the mouse placenta. I hypothesize that canonical and non-canonical receptors of interest in placental cannabinoid signaling (CNR1, CNR2, TRPV1, PPARg, GPR55) will each have unique spatiotemporal expression profiles, punctuated by generally increased expression in the labyrinth layer by mid-mouse gestation onwards.

METHODS: Wild-type CD31 mice were mated, pregnant females were dissected at embryonic day (E) 8.5, E10.5 and E18.5 and placentae were harvested, paraformaldehyde-fixed (4%) and paraffin-embedded (FFPE). RNA in situ hybridization (RNAscope) in 5-μm tissue sections was performed. The hybridization-based signal amplification system uses proprietary sequences of target probes, preamplifier, amplifier, and label probes, in the multiplex fluorescent detection of receptor-specific mRNA (Advanced Cell Diagnostics, Hayward, CA). 3-plex assays were conducted with receptor-specific probes and to enable colocalization, probes for two placental cell populations (Ctsq identifies the sinusoidal trophoblast giant cells (S-TGC) that line the maternal blood spaces and αSMA identifies the pericytes that wrap the fetal capillaries), in varying combinations on placentae sections (E8.5, E10.5, E18.5), with images captured on an M7000 microscope (Life Technologies).

RESULTS: CNR1, CNR2, and PPARg were expressed throughout the mouse placenta with differing levels of expression at representative gestational timepoints. CNR1 and CNR2 expression were higher earlier in gestation, decreasing with the progression of pregnancy, albeit still present at E18.5. Receptor expression was localized to both the mouse placental junctional zone and labyrinth layers and was not colocalized to Ctsq+ (S-TGC) or αSMA+ pericytes. Expression of PPARg increased throughout gestation and was localized to S-TGC in the placental labyrinth.
Conclusion: Increased patterns of expression of canonical CNR1 and CNR2 at E8.5 and E10.5 suggest increased susceptibility of the mouse placenta to endogenous and exogenous cannabinoids that bind these receptors in early-mid gestation. The increased expression of PPARg throughout gestation implicates this non-canonical receptor as increasing the organ's susceptibility to being acted on by cannabinoids into late gestation. The expression of canonical receptors must be investigated in relation to the remaining cell populations of the junctional zone and labyrinth layer to further specify receptor localization and susceptible cell types.

SIGNIFICANCE: Localization of these receptors in healthy placentae will identify which cell populations may be most vulnerable to cannabis exposure and specific windows of susceptibility. Based on functional similarities between the mouse and human placentae and the increasing use of cannabis in human pregnancy, these findings will provide valuable insights into proposed cannabinoid signaling and future directions in humans.

FUNDING: Research Initiation Grant, Queen's University; CFI; NICHD

P2. The effects of PlGF/NRP1 signaling on trophoblast cells in the mouse placenta

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OBJECTIVES: Placental Growth Factor (PlGF), a member of the vascular endothelial growth factor family, has widespread roles in non-branching angiogenesis, cell proliferation, cell migration, and immune cell regulation. The observation that Plgf -/- mice develop abnormal placental vasculature and elevated maternal PlGF levels in human pregnancy coincides with a switch to increased non-branching angiogenesis and terminal villi formation in the placenta supports the critical role of PlGF in proper placental development. It is established that PlGF increases placental trophoblast (TB) proliferation, survivorship, and migration; however, the effects of PlGF on TB differentiation are unknown. In addition to signaling through VEGFR1, PlGF also signals through neuropilin-1 (NRP1), though this interaction has not been investigated in the placenta. This study aims to (1) characterize PlGF and NRP1 gene and protein expression in mouse trophoblast stem (mTS) cells and the mouse placenta over gestation and (2) determine the effect of PlGF/NRP1 signaling on the trajectory of trophoblast differentiation. Since NRP1 null mice are embryonically lethal during a period that overlaps with labyrinth development, ***I hypothesize that PlGF signaling through NRP1 alters murine trophoblast differentiation towards a labyrinth fate.***

METHODS: To identify endogenous *PlGF* and *NRP1* in undifferentiated mTS and differentiated TB, mRNA expression of *PlGF*, *NRP1* and markers of TB subtypes were analyzed by RT-qPCR in cells cultured for 2-6 days in proliferative and differentiating culture conditions. To identify how inhibition of PlGF acting through the receptor NRP1 impacted TB differentiation as assessed by markers of TB subtypes, RT-qPCR analysis was performed on mTS cells cultured in differentiating conditions following 4 and 6 days of PlGF or PlGF + NRP1 inhibitor treatment. In each of these *in vitro* experiments respectively, unpaired t-tests were performed between averaged samples from each day and the proliferative Day 2 control or the untreated group. Paraffin-embedded mouse placenta sections were used for histological analysis to localize *PlGF* and NRP1 expression across gestation (E10.5 – E18.5). Given that PlGF is secreted, RNAscope, an *in situ* hybridization technique, was used to characterize the distribution and intensity of *PlGF* expression between the maternal decidua and fetal-derived junctional zone and labyrinth layers. NRP1 was similarly charcterized in the mouse placenta using immunohistochemistry.

RESULTS: *PlGF* expression was significantly increased during trophoblast differentiation ($p=0.0158$). *NRP1* expression showed a similar, albeit nonsignificant, trend. In a preliminary analysis, PlGF-treated undifferentiated mTS cells expressed significantly less *Cdx2*, a marker of TS cells, and *SYNA*, a differentiated syncytiotrophoblast marker, suggesting that PlGF may function to guide trophoblast differentiation towards a non-syncytiotrophoblast phenotype ($p=0.0062$; $p=0.0002$). Although NRP1 was broadly expressed in the mouse placenta, it appeared to concentrate in the labyrinth as gestation progressed. NRP1 staining was consistently highest at the fetal blood spaces. Experiments investigating the function of PlGF/NRP1 signaling are ongoing.

SIGNIFICANCE: Low maternal PlGF is being trialed as an antenatal biomarker for placentally-mediated pregnancy complications such as Fetal Growth Restriction and Preeclampsia. There is hope that exogenous PlGF could be used to treat these complications. Despite support for these uses of PlGF, the effects of exogenous PlGF on placental development and trophoblast differentiation is still lacking. As such, in addition to elaborating on the contributions of angiogenic factors in placental development, my study will provide fundamental knowledge to improve the development of PlGF as a clinical tool.

FUNDING: NIH/NICHD & CIHR

P3. Mast cells in the pathophysiology of Endometriosis

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**Queen's University, Kingston, ON, Canada, †University of Toronto, ON, Canada; ‡University of North Carolina, Chapel Hill, NC, USA*

OBJECTIVES: Endometriosis (EMS) is an estrogen (E2) dependent, chronic inflammatory disease characterized by the growth of endometriotic tissue outside the uterus. Immune cells contributing a network of chemokines and cytokines affecting EMS lesion growth is an evolving concept. Mast cells (MCs) have emerged as key players in mechanisms such as angiogenesis and fibrosis. The influence of E2 on MC function has been recognized as a potential driver of disease in a number of chronic inflammatory conditions, however a knowledge gap remains for MCs in EMS pathophysiology. **Specifically, does the EMS lesion microenvironment recruit MCs, and how does E2 impact MC activity in EMS?**

METHODS: MC numbers within EMS lesions and matched endometrium were measured with immunohistochemical analysis. Concentration of stem cell factor (SCF), a vital growth factor for MCs, was measured in EMS lesions and endometrium by ELISA. To evaluate propensity of EMS lesions to recruit and differentiate MCs, patient samples of EMS lesions, eutopic endometrium, and healthy control endometrium were analyzed with a targeted qPCR array of genes relevant to MC biology. To observe crosstalk *in vitro*, endometriotic epithelial cells (12Z) were cultured with MC-conditioned media. Multiplex cytokine analysis was performed on supernatant. To observe impact of E2 on MC recruitment in EMS, we induced EMS in 12 C57BL/6 mice and treated 6 with subcutaneous E2 pellets. After 10 days, peritoneal cells were analyzed by flow cytometry using MC markers CD117, FCERIα and MC progenitor marker integrin-β7. Mouse EMS lesions were stained with alcian blue to analyze MC density.

RESULTS: We observed significantly higher MCs in EMS lesions compared to matched endometrium. Compared to endometrium, EMS lesions had significantly higher SCF concentration ($p \leq 0.05$). Our targeted qPCR array revealed EMS lesions harbour a microenvironment conducive to MC recruitment and differentiation (upregulated CPA3, VCAM1, CCL2, CMA1, CCR1, and SCF, $p \leq 0.05$). Cytokine analysis showed MC-conditioned media significantly increased 12Z cells' production of cytokines IL-6 and IL-8 ($p \leq 0.05$). Flow cytometry analysis of mouse peritoneal immune cells showed significantly higher frequency of MC progenitors in E2-treated mice compared to non-treated mice ($p \leq 0.05$). The EMS lesions from E2-treated mice had significantly higher density of alcian blue stained MCs compared to healthy control endometrium ($p \leq 0.05$).

CONCLUSIONS: Collectively, these findings suggest that EMS lesions provide a microenvironment necessary for recruitment and differentiation of MCs. In turn, MCs potentially release pro-inflammatory mediators that contribute to EMS pathogenesis.

P4. Thromboelastography as a Tool for Evaluation of Hypercoagulability Associated with Hormonal Contraception in Young Women

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OBJECTIVES: To assess the coagulation profile in association with hormonal contraception in young female using thromboelastography (TEG) and evaluate the potential value of TEG in monitoring possible risk of thrombosis and guiding individualized approach hormonal contraception.

METHODS: 300 young females were recruited from two post-secondary institutions (Queen's University and St Lawrence College) for this study. Data on age, type, duration and whether first or recurrent use, were collected. Citrated whole blood was drawn within the first 14 day of menstrual cycle. TEG was performed using a TEG® 5000 Hemostasis System. The following major parameters were evaluated: time to clot formation (R), rate of clot formation (K), speed of clot propagation (α), strength of clot (MA), Clot lysis after 30 min. (LY30) and clotting index (CI). Student t test was used to assess the difference in TEG parameters between HC users and non-users.

RESULTS: 40 females (24 users and 16 non-users), aged 19- 29 were tested to date. Average reported duration of use was 5 years. Comparative analysis of TEG parameters of the two age-matched groups showed no significant difference in any of the parameters, in HC-users compared to the non-users (Table 1). However, a significant hypercoagulability was observed in α angle (p= 0.02) and there was a trend towards hypercoagulability in CI (0.09) with increased duration of HC use (Table 2).

CONCLUSIONS: Based on this small sample, there seems to be no change in coagulation profile with HC use but increased coagulability is observed over time with longer duration of use. Additional assessments are needed before a final conclusion can be made.

FUNDING: SLC Ignite Funds, St Lawrence College.

Table 1: Comparison between female non-HC users and HC users in relation to TEG parameters

AGE & TEG PARAMETERS	NON HC USERS (N=16)	HC USERS (N=24)	P-VALUE
AGE (Mean ±SD)	21.7±3.1	21.6±2.3	0.9
R (Mean ±SD)	9.6±2.9	8.3±2.4	0.13
K (Mean ±SD)	2.8±1.4	2.5±1.6	0.55
α (Mean ±SD)	55.2±10.9	58.6±10.8	0.3
MA (Mean ±SD)	65.8±8.4	65±5.6	0.7
CI (Mean ±SD)	2±0.7	2.3±1	0.4
LY30 (Mean min-max)	0.67 (0.06-1.3)	1.4 (0.7-2)	0.14

Table 2: Comparison between TEG parameters means in relation to HC duration of use by the female participants

TEG PARAMETERS	HC USERS			P-VALUE
	Less than 1 year	1 year to 5 years	More than 5 years	
R (Mean ±SD)	9	7.9	9.5	0.3
K (Mean ±SD)	2.8	2.27	2.1	0.7
α (Mean ±SD)	35	59.9	61.1	0.02
MA (Mean ±SD)	69.3	62.5	65.6	0.2
CI (Mean ±SD)	-	1.8	2.7	0.09
LY30 (Mean min-max)	-	1.4	1.15	0.7

P5. A peripartum vascular assessment of women with preeclampsia.

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Department of Obstetrics & Gynecology and Queen's University.

OBJECTIVES: To determine if there are microvascular structural differences in individuals diagnosed with preeclampsia during pregnancy, compared to controls, and if these differences persist into the early postpartum period.

METHODS: This study was undertaken at KHSC – KGH. Included in the study are 36 control participants and 12 participants diagnosed with preeclampsia. Eligible participants were between the ages of eighteen and forty and were pregnancy with a single neonate. Exclusion criteria included a history of hypertension, gestational hypertension, diabetes, gestational diabetes, lupus, kidney disease, coronary heart disease, adverse cardiac events, Raynaud's syndrome, scleroderma, arthritis or other collagen-vascular diseases. Consented participants took part in two study visits, the first within 2-weeks prior to delivery, and the second within 48-hours postpartum. Due to a lack of interest in antepartum visits by participants with preeclampsia, six of the twelve participants were only evaluated postpartum. In order to assess microvascular structure, nailfold video capillaroscopy (NVC) was used. NVC is non-invasive, easy to use at the bedside, and allows for the visualization of the nailbed. The images captured were then manually counted to determine the number of capillaries per 1mm2. GraphPad Prism was used for statistical analysis. Repeated measures two-way ANOVA test was used for nailbed capillary density comparisons.

RESULTS: Preliminary data indicates that there is no difference in nailbed capillary density between individuals with preeclampsia (P=0.58). Additionally, no significant difference was found when comparing nailfold capillary density antepartum and postpartum in participants with preeclampsia (P=0.46). In both groups, nailfold capillary density did significantly increase after inducing venous occlusion at both antepartum (P=0.003) and postpartum (P=<0.0001) study visits.

CONCLUSIONS: Our results suggest that the microvascular structure of individuals with preeclampsia may not be impacted at the time of diagnosis before delivery nor in the short term postpartum. Moreover, the significant increase in density after inducing venous occlusion in both groups may further indicate that microvascular structure is not affected by preeclampsia. However, further investigation is required to clarify these initial findings and their clinical significance.

P6. Incidence and Risk Factors of Thromboembolic Events in Ovarian Cancer Patients - Results from a Population Database

Sydney Penfound (BScH, 2022), Alexandra Lukey, Jessica Hodgson, Wilma Hopman, Gillian Hanley, Maha Othman

OBJECTIVES: Ovarian cancer (OC) patients are at high risk of thromboembolism due to the hypercoagulable state of malignancy. While this association has been well studied regarding venous thromboembolism (VTE), there is a lack of evidence regarding the risk of arterial thromboembolism (ATE). It is also unknown if other risk factors for thrombosis are involved. Appropriate identification of the incidence and risk factors for VTE and ATE present in patients with OC from a Canadian population will enable more targeted, effective, and safe thromboprophylaxis.

METHODS: We analyzed thromboembolic events in all patients diagnosed with epithelial OC between January 1996, and December 2017, in British Columbia, Canada (n = 4,491). This retrospective cohort study was conducted using medical records obtained from PopDataBC, a de-identified health record database. VTE, ATE and comorbidities in medical records were identified using ICD-9-CM and ICD-10-CM codes. The presence of comorbidities was compared between cancer patients who developed VTE or ATE and those who did not. Statistical analysis was performed using Chi-squared test or Fisher's exact test in cases where cell counts were <5 patients. A p-value <0.05 was considered significant.

RESULTS: Of 4,491 patients with epithelial OC (mean age of 61.4 years), 1.36% experienced ATE and 6.75% experienced VTE. Mean follow-up time was 5.76 years. Sepsis was significantly associated with VTE and ATE, wJshile the top four risk factors for ATE only were: sepsis, peripheral vascular disease, open wound, and intracranial injury. The occurrence of ATE and VTE was significantly associated with overall mortality.

CONCLUSIONS: Risk factors predicting thromboembolic events in OC patients are not consistent between both ATE and VTE. Thrombosis risk assessment is needed to reduce thrombosis occurrence and improve the quality of care in this cohort.

P7. 10-Year Review of the Postpartum Maternal Health Clinic at the Kingston Health Sciences Center

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Department of Obstetrics & Gynecology and Queen's University.

BACKGROUND: The Postpartum Maternal Health Clinic sees patients with pregnancy complications designated as pregnancy-related cardiovascular risk indicators (hypertensive disorders of pregnancy, gestational diabetes, placental abruption, idiopathic preterm delivery, and intrauterine growth restriction) at 6 months postpartum for cardiovascular risk screening.

OBJECTIVES: To summarize the past 10 years of the clinic and identify trends in patient characteristics and cardiovascular disease risk assessments over time.

METHODS: Patients included in this study have experienced one or more pregnancy-related cardiovascular risk indicator(s) and have delivered between April 2011 and April 2021. These patients would have attended the clinic during the period of interest, November 2011 to November 2021. To identify trends, this period of interest has been divided into 4 clinically significant time periods (2011/01 – 2013/12, 2014/01 – 2015/06, 2015/07 – 2020/02, 2020/03 – 2021/11). Descriptive statistics (mean ± standard deviation, median [interquartile range], and counts (percentages)) are used to describe patient characteristics and cardiovascular risk profiles and factors. Time periods were compared using a Kruskal Wallis or Chi Square test. Multiple comparisons were adjusted using the Bonferroni correction.

RESULTS: The clinic has seen 1,030 patients in the last 10 years, with 561 referred for hypertensive disorders of pregnancy (54.5%), 363 for gestational diabetes (35.2%), 45 for idiopathic preterm birth (4.4%), 87 for intrauterine growth restrictions (8.4%), and 41 for placental abruption (4.0%).

The characteristics of patients have remained largely consistent. However, there has been an increase in the proportion of patients seen because of a hypertensive disorder and an increase in the proportion of patients with obesity, abnormal total cholesterol, and elevated fasting glucose.

Among all patients, 431 (48.7%) were found to be at high lifetime risk for cardiovascular disease, 378 (39.9%) had a 30-year CVD risk score calculated using BMI ≥10%, 244 (27.7%) had a 30-year CVD risk score calculated using lipids ≥10%, and 202 (19.6%) met the criteria for the metabolic syndrome.

CONCLUSIONS: The proportion of MHC patients with high lifetime and 30-year cardiovascular disease risk scores as well as prevalence of metabolic syndrome have remained consistent over the years. There remains a need to screen these patients for cardiovascular risk and counsel them on risk reduction.

P8. Attention Deficit Hyperactivity Disorder in Children Born to Mothers with Infertility: A Population Based Cohort Study

Alexa Fine (Meds 2023), Natalie Dayan, Maya Djerboua, Jessica Pudwell, Deshayne B. Fell, Simone Vigod, Joel G. Ray, Maria P. Velez.

Department of Obstetrics and Gynaecology, Queen's University

BACKGROUND: Long-term neurodevelopmental outcomes of children conceived with fertility treatment are unknown. Studies linking fertility treatment and attention deficit hyperactivity disorder (ADHD) have been inconclusive, and limited by confounding by indication. This study investigated the association between infertility, fertility treatment, and risk of childhood ADHD.

METHODS: This population-based cohort study included infants born at ≥ 24 weeks' gestation across Ontario, 2006-2014. The study exposure was conception type: i) unassisted conception (referent), ii) infertility without fertility treatment, iii) ovulation induction or intrauterine insemination (OI/IUI), or iv) *in vitro* fertilization or intracytoplasmic sperm injection (IVF/ICSI). The study outcome was ADHD diagnosed from age 4 years. Cox proportional-hazards models generated hazard ratios (HR), adjusted for maternal age, income quintile, rurality, immigration status, smoking, obesity, parity, any drug or alcohol use, maternal history of mental illness, including ADHD, pre-pregnancy diabetes mellitus or chronic hypertension, and infant sex.

RESULTS: 925,488 children were born to 663,144 mothers: 87.0% following unassisted conception; 10.2% following infertility without fertility treatment, 1.3% OI/IUI, and 1.5% IVF/ICSI. Starting at age 4 years, children were followed for a median of 6 years (IQR 4-8). ADHD occurred among 7.0% of offspring in the unassisted conception group, 7.5% in the infertility without fertility treatment group, 6.8% after OI/IUI, and 6.3% following IVF/ICSI. Relative to the unassisted conception, the adjusted HR for ADHD was 1.19 (95% CI 1.16-1.22) in the infertility without fertility treatment group, 1.09 (95% CI 1.01-1.17) following OI/IUI, and 1.12 (95% CI 1.04-1.20) after IVF/ICSI. Female children had lower overall absolute rates of ADHD in all exposure categories than males, but higher HRs, than seen among males.

CONCLUSIONS: Infertility itself may be an unrealized risk factor for ADHD in offspring, which is not apparently amplified by use of fertility treatment. The reason underlying this finding warrants further study.

P9. Factors affecting contraceptive choice and decision making in persons of reproductive age in Kingston, Ontario

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Department of Obstetrics and Gynaecology, Queen's University

BACKGROUND: There are over 180,700 unintended pregnancies yearly in Canada. Unintended pregnancies can have negative health, social, financial, and psychological consequences. Healthcare provider counselling has been shown to have a positive influence on contraceptive use, uptake, and adherence, which can reduce the likelihood of unintended pregnancy. Successful contraceptive counselling has been shown to use comprehensive, personalized information provision and decision-making support. Previous studies that have explored contraceptive choice have focused on autonomy, acceptability of methods, factors influencing choice, and counselling practices. Those that assessed importance of specific factors in choice were limited by lack of ranked list, and by population studied.

OBJECTIVES: To assess which factors influence and are most important in decision-making regarding contraceptive choice for persons of reproductive age in Kingston, Ontario.

METHODS: A cross-sectional survey of persons of reproductive age attending appointments at Kingston Health Sciences Centre (KHSC) was conducted. Active recruitment was done at obstetrics and gynecology clinics while posters were used for recruitment at family medicine clinics. Demographic information was collected as well as pregnancy history, previous contraceptive use, and choice of contraception at their appointment. Primary outcomes studied included which factors influence contraceptive choice and which factors are most important to participants. A Likert scale and a ranked list were used to assess importance of factors.

RESULTS: There were 96 survey respondents between [insert dates] that met eligibility criteria. Among respondents, 63.16% chose a long-acting reversible contraceptive (LARC) method at their appointment. Effectiveness, ease of use, and safety were rated as "very important" the most frequently. Effectiveness was most frequently ranked first, followed by safety and negative effects. Affordability, ease of starting the method, impact on breast feeding, and medical condition contraindications, were most often rated "not at all important". Affordability, ease of starting the method and medical condition contraindications were least often ranked in the top three positions on the ranked list. Limitations of the project include a limited population used for sampling, as most participants were recruited from clinics which specialize in offering certain types of contraception such as the IUD and implant. Effectiveness and ease of use are factors often attributed to LARC methods of contraception, which were most often chosen at appointments.

CONCLUSIONS: Effectiveness, ease of use and safety, as well as negative side effects, are very important to those seeking contraception, which are characteristics common to LARC methods. The results from the Likert rating scale were similar to those from the ranked list. This information about factors important to people in contraceptive choice can improve healthcare provider counselling and allow for targeted design of future contraceptive methods that would have improved acceptability. Future studies should focus more on a general population, such as that presenting to a family physician for contraception.

P10. Menopause Hormone Therapy and sarco-dynapenia among postmenopausal women: analysis of the Canadian Longitudinal Study on Aging

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BACKGROUND: The decline in muscle mass (sarcopenia) and strength (dynapenia) that women experience after menopause could be associated with low estrogen levels in this life stage. The role of Menopause Hormone Therapy (MHT) on preventing or delaying sarco-dynapenia is unknown.

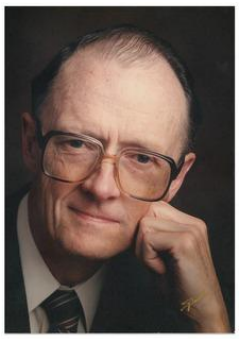
OBJECTIVES: To study the association between MHT and sarco-dynapenia in postmenopausal women from the Canadian Longitudinal Study on Aging (CLSA).

METHODS: Cross-sectional study of 10,834 postmenopausal women from CLSA. Sarcopenia was defined as an appendicular lean mass <5.72 kg/m^2 using DXA. Dynapenia was defined as a grip strength <20.4kg using a hand-held dynamometer. The concomitant presence of sarcopenia and dynapenia was defined as sarco-dynapenia. Women self-reported previous or current use of MHT and this variable dichotomized in never or ever. Poisson regression analysis assessed the associations between sarco-dynapenia and MHT adjusted by covariates (age, education, study site, smoking, diabetes, hypertension, and body mass index). Additional analyses were conducted by MHT duration (≤5 years vs. >5 years), age categories (45-64 vs 65 and older) and physical activity level (less active vs. more active, according to the Physical Activity Scale for Elderly score).

RESULTS: The prevalence ratio of sarco-dynapenia did not significantly differ according to MHT use (PR=1.10, 95%CI= 0.89; 1.35), irrespectively of age and physical activity. MHT use for ≤5 years was associated with a higher prevalence of sarco-dynapenia among less active women (PR=1.57, 95%CI=1.11; 2.21), and with a lower prevalence among those more active (PR=0.60, 95%CI=0.39; 0.92), compared to non-use. MHT >5 years was not associated with sarco-dynapenia.

CONCLUSIONS: Our findings that MHT for ≤5 years is associated with lower prevalence of sarco-dynapenia among physical active women, but not in those less active. Strategies to promote an active lifestyle among MHT users are needed to attain benefits on musculoskeletal health.

Remembering Dr. Low



James A Low, MD
1925-2015
Professor and Head of the Department of Obstetrics & Gynaecology and Chief of Service at KGH from 1965 to 1985

Dr. Low came to Kingston in 1965 to assume the position of Professor and Head of Obstetrics & Gynaecology, Queen's University and the Chief of Service at the Kingston General Hospital. During the twenty years as Head, he was instrumental in shaping the Queen's Department of Obstetrics & Gynaecology into one of the most respected academic clinical departments and one of the most sought after postgraduate residency programs in the country. Furthermore, during his tenure as the Head, the department became recognized for academic excellence at the national and international levels in the areas of maternal-fetal medicine, urogynecology and gynecologic oncology. It was through the philosophy and ideals of Dr. Low that the department continues to flourish and remains to this day one of the country's more successful academic departments of obstetrics and gynaecology.

At various times during his career, Dr. Low served as Secretary/Treasurer, Vice President and President of the Association of Professors of Obstetrics and Gynaecology of Canada (APOG), Chair of the Specialty Committee for Obstetrics & Gynecology and Chair of the Manpower Committee for the Royal College of Physicians and Surgeons of Canada, Chair of the Postgraduate Manpower Committee of the Council of Ontario Faculties of Medicine, Chair of the Perinatal Medicine Committee for the Society of Obstetricians and Gynaecologists of Canada (SOGC) and member of the Editorial Board for the two most prestigious journals in our specialty; Obstetrics & Gynecology and the American Journal of Obstetrics & Gynecology.

From his first peer-reviewed publication in 1959 to finishing his last manuscript the week before he died, Dr. Low has had one of the most influential and productive careers as an academic obstetrician and gynecologist in Canada. He is recognized as a world-renowned expert in the fields of fetal asphyxia, cerebral palsy and female urinary incontinence. With all of these achievements, Dr. Low always identified that his successes have been a part of his role with the Department at Queen's and has always promoted recognition of this university.

Following his retirement from clinical practice in the early 1990s, he embarked on a second career when he established and had been leading and promoting the Museum of Health Care at Kingston until shortly before his passing.

Dr. Low received many awards during his lengthy career including being named a Fellow of the Royal College of Obstetricians and Gynaecologists (United Kingdom), Queen's University Distinguished Service Award, Kingston First Capital Honourable Achievement Award, Queen Elizabeth Diamond Jubilee Medal and this year, just prior to his death, Dr. Low was invested into the Order of Canada, specifically for his work with the Museum of Health Care.

Visit our website at: https://obgyn.queensu.ca/research/james-low-research-day-2022