TOUR01

Retinal Toxicity in a Multinational Inception Cohort of Systemic Lupus Patients on Hydroxychloroquine

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Objectives: Despite the beneficial effects of hydroxychloroquine (HCQ) in systemic lupus erythematosus (SLE), retinal toxicity is a concern. Factors associated with retinal toxicity have been studied among long-term HCQ users but have not been described for incident SLE patients. We evaluated the incidence of HCQ-related retinal toxicity in a large, international, inception cohort of SLE patients, and assessed factors potentially associated with this event.

Methods: We analyzed prospective data from the Systemic Lupus International Collaborating Clinics (SLICC) cohort, that includes SLE patients from 33 sites in Europe, Asia, and North America, enrolled within 15 months of diagnosis. Using annual study visits between 1999-2019, we followed patients from first visit on HCQ (time zero/baseline) up to the time of retinal toxicity documentation (outcome) or death, loss to follow-up, or censoring at end of study interval. Retinal toxicity was identified based on the SLICC/ACR damage index item for retinal damage and cases were confirmed with chart review. Multivariable Cox regression was used to estimate adjusted hazard ratios (aHRs) and 95% confidence intervals (CIs) for baseline factors potentially associated with retinal toxicity (i.e., sex, race/ethnicity, age at SLE onset, HCQ daily dose/kg, body mass index, and smoking). We also plotted a Kaplan-Meier curve for probability of retinal toxicity related to total duration of HCQ therapy.

Results: A total of 1460 patients (89% female, 52% Caucasian) were included. Mean SLE duration at time zero (HCQ initiation) was 2.4 (standard deviation, SD 2.2) years and patients remained on HCQ an average of 6.4 (SD 4.2) years. Retinal toxicity was confirmed for 11 patients (incidence 1.0 per 1000 person-years) at a mean of 8.8 (SD 4.0) years. Our hazards

regression model identified greater risk in patients who were older at SLE diagnosis, and non-significant trends for greater risk in black patients, those receiving more than 5 mg per kg at baseline, and overweight patients. In the Kaplan-Meier curve, the crude probability of retinal toxicity was less than 1% until 10 years of cumulative HCQ use, but increased around 1% each year after that, reaching 5% after 14 years.

Conclusion: In recent-onset SLE patients receiving HCQ, the probability of retinal toxicity increases after 10 years of cumulative use. We observed higher risks among those older at SLE onset and there were non-significant trends for greater risk in black patients, those receiving more than 5 mg/kg at baseline, and overweight patients. More sophisticated analyses with time-dependent variables are under way.

TOUR02

Risk of Serious Infections in Offspring Exposed In Utero to Ustekinumab

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Objectives: Ustekinumab and other biologics, which harbour an Fc portion, are actively transported across the placenta, often reaching higher fetal than maternal levels. Ustekinumab, an IL-12/23 inhibitor, is indicated for use among patients with psoriasis (PsO), psoriatic arthritis (PsA), and inflammatory bowel disease (IBD), but there is currently little evidence regarding its safety in pregnancy. We compared the risk of serious infections in offspring exposed to ustekinumab, tumour necrosis factor inhibitors (TNFi), non-TNFi biologics, and non-biologic immunosupressives versus offspring unexposed during pregnancy among women with PsO, PsA, or IBD.

Methods: We conducted a retrospective cohort study using the US MarketScan database, an employment insurance database. We included live (01/2011-12/2018) births among women with PsO, PsA, and/or IBD and a randomly selected group of unaffected mothers matched 10:1 on age, geographic location and year of delivery. Drug exposure was defined as ≥1 filled prescription or infusion procedure code during or within 3 months prior to pregnancy. In offspring, we evaluated serious infections within the first year of life. We performed multivariate analyses using logistic regression, adjusting for maternal age, co-morbidities, corticosteroids use, and preterm birth

Results: We included 16,130 offspring born to 7,623 women with PsO/PsA, 8,319 with IBD, 188 with PsO/PsA and IBD, and 160,762 matched controls. A total of 52 women were exposed to ustekinumab, 51 to other non-TNFi biologics (mostly vedolizumab, n=36), 1,588 to TNFi, 1,861 to non-biologic immunosuppressives alone, and 12,578 unexposed to any drug. The percent of serious infections in children exposed to ustekinumab (3.9%; 95% CI 0.5-13.9) was identical to that observed among children exposed to other non-TNFi biologics (3.9%; 95% CI 0.5-14.2). The risk was 2.6% (95%CI 1.9-3.6) in children exposed to TNFi, 2.4% (95%CI 1.8-3.3) among those exposed only to non-biologic immunosuppressives, and 2.6% (95% CI 2.3-2.9) among those unexposed to any drug. The percent of serious infections in children born to control mothers was 2.0% (95% CI 1.9-2.1). In multivariate analyses of children exposed to ustekinumab or non-TNFi biologics versus unexposed offspring born to affected mothers, our point estimates were consistent with increased risk, but the CIs were wide, including the null value [OR for ustekinumab 1.47 (95% CI 0.35-6.1); OR for non-TNFi biologics 1.38 (95% CI 0.34-5.54)].

Conclusion: In a large cohort of inflammatory disease offspring, we observed a potential trend

for more serious infections in children exposed to ustekinumab or non-TNFi biologics versus unexposed offspring, although the CIs were wide, precluding strong conclusions.

TOUR03

Genome-wide Sequencing Identified Rare Genetic Variants for Childhood-onset Monogenic Systemic Lupus Erythematosus

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Objectives: Our aim was to calculate the burden of rare variants in monogenic systemic lupus erythematosus (SLE) genes, in children suspected of monogenic SLE or lupus-like disease.

Methods: From our multiethnic cohort of cSLE patients at SickKids, Toronto, we examined demographic and clinical features, comparing groups with t-tests for continuous variables, and Fisher's exact test for categorical variables. We completed paired end whole genome sequencing (WGS) or whole exome sequencing (WES) in patients suspected of monogenic SLE. We prioritized rare (MAF<1%) nonsynonymous variants (frameshift, missense and stop-gain) in 36 monogenic SLE genes and compared allele frequencies in our cohort to population frequencies in gnomAD (Chi-squared tests (Bonferroni correction P<7x10-4)). We further prioritized predicted deleterious variants using Polyphen (>0.446), SIFT (<0.05) and/or CADD scores (≥15). We then considered zygosity and predicted mode of inheritance. We filtered for copy number variants (CNVs) >1kb in 36 monogenic SLE genes. Participants also underwent genotyping on the Illumina multiethnic MEGA or GSA array. Additive non-HLA and HLA SLE genetic risk scores (GRS) were calculated using common risk alleles. We tested the association between GRSs and the burden of nonsynonymous variants with logistic (0 vs. ≥1 variant) and multivariate analyses (0 vs. 1 vs. >1), adjusted for sex (female, male), ancestry (Admixed, African, Amerindian, East Asian, Middle Eastern, South Asian) and age at diagnosis.

Results: The cohort included 71 patients (80% female), with a mean age at diagnosis of 8.5 years (SD=±2.9) and 42% of patients with kidney or neuropsychiatric disease. We identified predicted disease-causing variants in 9 patients (13%) who were significantly younger at SLE diagnosis compared to those without a rare disease-causing variant (6.9 years (SD=±2.1) vs. 8.8 years (SD=±3.0), P=0.048). We did not identify disease causing CNVs >1kb. We did not find a significant association between non-HLA GRS and carrying 1 or more rare nonsynonymous variants (OR=1.42; 95% CI=0.73, 2.91; P=0.32), nor between HLA GRS and rare nonsynonymous variants (OR=1.28; 95% CI=0.12, 14.8; P=0.89), in univariate and multivariable adjusted models. We also did not find a significant association between GRSs and rare nonsynonymous variant count in multivariate analyses.

Conclusion: We identified a likely causal genetic variant for monogenic SLE in 13% of patients sequenced. We did not detect a significant association between SLE-GRSs comprised of

common SLE risk variants, and the number of rare nonsynonymous variants. Additional studies are needed to validate our findings.

TOUR04

Marijuana (Herbal Cannabis) Use in Patients Attending Outpatient Rheumatology Clinics after Cannabis Legalization

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Objectives: Following recreational cannabis legalization in Canada, increased interest in medical marijuana is anticipated among rheumatology patients. There are limited data regarding cannabis for the treatment of rheumatic diseases, and little Canadian data regarding the prevalence of cannabis use in these patients. Furthermore, doses and routes are not standardized, product concentrations are not regulated, and physicians do not have control over how patients use cannabis after it is prescribed. Our aim is to assess the prevalence of marijuana use in a hospital-based rheumatology clinic patient population and to examine factors associated with the use of marijuana including perceived benefits and harms, associations with patient demographics, diagnoses, and severity of disease.

Methods: This is an observational study involving one thousand consecutive patients attending the Health Sciences Centre (HSC) Rheumatology Clinic. Patients are provided a questionnaire regarding cannabis use. Questions include whether cannabis use was recreational/for pleasure, or for medical reasons/symptom relief, previous and/or current use, specific symptoms relieved or side effects experienced and form, route and dose and source of cannabis. Rheumatologists complete a questionnaire to provide information regarding patients' diagnosis, demographics, comorbidities, rheumatologic medications and physician global disease severity.

Results: Preliminary data was analyzed from 675 initial patient surveys. A history of medical cannabis use was reported in 170 patients (25.2%), with 106 patients (15.7%) reporting current medical use. A history of recreational use was reported in 440 patients (65.2%), with current recreational use in 83 patients (12.3%). Sixty percent (n=305) of patients with no history of medical cannabis use reported that they would consider it. The most common symptoms reported to be alleviated by marijuana among the 170 patients that had used medical cannabis were joint pain (141, 82.9%), poor sleep (117, 68.8%), anxiety (72, 42.4%), other pain (64, 37.6%), and fatigue (37, 21.8%).

Conclusion: These preliminary data suggest that a significant proportion of patients followed at the HSC Rheumatology Clinic use medical cannabis for symptom management. Our prevalence appears to be much higher than the 8.2% ever /6.5% current medical cannabis use reported (Fitzcharles et al, 2020) at McGill. This may indicate growing popularity of medical cannabis as the McGill study was conducted one year earlier, demographic factors such as age (mean age 53 vs 64 at McGill), or regional differences. Further completion of patient and physician surveys will improve our understanding of patterns of use and perceived harms and benefits.

TOUR05

Barriers and Facilitators to Physical Activity for People with Scleroderma: A Scleroderma Patient-centered Intervention Network (SPIN) Cohort Study

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Objectives: Regular physical activity is important to enhance health for people with systemic sclerosis (SSc; scleroderma), but there are barriers to engagement in activity. We previously identified physical activity barriers and facilitators via group interviews; however, the proportion of people with SSc experiencing barriers, their importance, and likelihood of using facilitators are not known. Our objectives were to determine the (1) prevalence and importance of barriers to physical activity experienced by people with SSc and (2) likelihood of using barrier-specific and general facilitators to physical activity.
Methods: We invited 1,707 participants enrolled in the Scleroderma Patient-centered Intervention Network cohort to complete a separate survey to rate (4-point Likert scale): (1) importance of experienced barriers; (2) likelihood of using corresponding barrier-specific facilitators and general facilitators and whether they have previously tried them.
Results: Among 721 respondents, 13 barriers (12 medical-related, 1 motivation-related) were experienced by ≥ 25% of total participants. Fatigue and Raynaud's phenomenon were considered 'important' or 'very important' by ≥ 50% of participants; 7 other barriers, addressing limited hand function, activity restrictions due to various pathologic changes, and low motivation were considered 'important' or 'very important' by 26-50%. Overall, 23 of 103 facilitators were rated by ≥ 75% as 'likely' or 'very likely' to use among those who experienced corresponding barriers; these facilitators focused on adapting exercise, taking care of one's body, keeping warm, and protecting skin. All facilitators were considered 'likely' or 'very likely' to use by ≥ 50% of those who experienced the corresponding barrier and had tried them versus 12 of 103 among those with the barrier who had not tried them.
Conclusion: Medical-related barriers to activity were most commonly experienced and considered important; Raynaud's phenomenon and fatigue were the most commonly experienced. Facilitators widely considered likely to be used addressed adapting exercise type or setting, using health behaviours to take care of the body, and using clothing or materials to protect the skin or to keep warm. Participants who had tried facilitators were generally more likely to use them again compared to participants who had never tried them.

TOUR06

Are Patients with Immune Medicated Inflammatory Diseases More Likely to Receive COVID-19 Tests and Test Positive for SARS-CoV-2? A Matched Population-based Study

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Objectives: To investigate the probability of being tested and the risk of being found positive for COVID-19 in patients with immune mediated inflammatory diseases (IMIDs) compared with matched non-IMID comparators from the general population in Ontario.
Methods: A population-based, matched cohort study was conducted using health administrative data from adult Ontario residents from January to September 2020. Ten cohorts of the following IMIDs were assembled: rheumatoid arthritis, psoriasis, psoriatic arthritis, ankylosing spondylitis, systemic autoimmune rheumatic diseases (including systemic lupus, scleroderma, Sjogren's, dermatomyositis/polymyositis, undifferentiated connective tissue disease), multiple sclerosis, iritis, inflammatory bowel disease (IBD), polymyalgia rheumatica (PMR) and vasculitis (including giant cell arteritis and other types of vasculitidies). Each patient was matched with 5 non-IMIDs comparators based on age, sex, area of residence and living in long-term care (LTC). Between IMIDs and non-IMIDs, we compared the proportion tested for COVID-19, as well as those testing positive. Multivariable logistic regression analyses assessed sociodemographic factors associated with COVID-19 testing and positivity.
Results: A total of 505,302 IMID patients and 2,525,958 non-IMID comparators were assessed. Significantly more IMIDs patients versus non-IMIDs were tested for COVID-19 (18.3% vs. 14.6%), while the proportion of those who tested positive for COVID-19 was identical (0.3% of all patients in both groups). The age- and sex-standardized rate of COVID-19 testing was significantly higher in IMIDs than non-IMIDs (1,737.1 vs. 1,397.4 tested patients per 10,000 population, respectively). Overall, testing rates were significantly higher across all IMIDs groups versus their respective matched non-IMID comparators, being highest in vasculitis, PMR and SARDs. The standardized rate of positive COVID-19 tests was similar in IMIDs and non-IMIDs patients (30.5 and 29.2 per 10,000 population). Overall, IMIDs patients were more likely to undergo COVID-19 testing (adjusted odds ratio, (adjusted-OR) 1.22, 95% CI 1.21, 1.23) and highest in vasculitis (adjusted-OR 1.56), PMR (adjusted-OR 1.36) and SARDs (adjusted-OR 1.33). While no association was observed between being found positive for COVID-19 and all IMIDs, vasculitis patients were more likely to have positive COVID-19 tests (adjusted-OR 1.19) while IBD patients were less likely to have positive tests (adjusted-OR 0.75). The strongest association with COVID-19 testing and positive testing was residence in LTC. Additional factors associated positive COVID-19 testing were multimorbidity, urban residence, and lower socioeconomic status.
Conclusion: Patients across all IMIDs were more likely to be tested for COVID-19 versus non-IMIDs patients, but their risk of being found positive for COVID-19 was not elevated overall.

TOUR07

Patient-Reported Outcome Response and Safety Profile in Patients With Moderately to Severely Active Rheumatoid Arthritis Treated With Baricitinib 2-mg

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Objectives: Baricitinib improved patient-reported outcomes (PROs) in patients with active rheumatoid arthritis (RA) and an inadequate response (IR) to ≥1 tumor necrosis factor inhibitors

or other biological DMARDs (bDMARDs)1, or to conventional synthetic DMARDs (csDMARDs)2. The objective of this post-hoc analysis was to describe the PRO response of baricitinib 2-mg versus placebo at Week 24 among patients who achieved minimally clinically important difference (MCID) improvement at Week 4 and Week 12, in addition to long-term safety of baricitinib 2-mg.
Methods: Data were assessed from two phase 3 studies, RA-BEACON (NCT01721044; bDMARD-IR patients) and RA-BUILD (NCT01721057; csDMARD-IR patients). PROs included pain by visual analog scale, HAQ-DI, Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F), duration of morning joint stiffness (MJS), and Short-Form 36 physical component score (SF-36 PCS). MCID was defined as ≥10mm reduction for pain, ≥0.22-unit reduction for HAQ-DI, ≥3.56-point improvement for FACIT-F, ≥30-minute improvement for MJS duration, and ≥5-unit improvement for SF-36 PCS. For each PRO, the proportion of patients who continued to report improvement ≥MCID at Week 24 were calculated based on those with MCID improvements at Week 4 and Week 12. An integrated long-term safety analysis of baricitinib 2-mg was reported.
Results: Among bDMARD-IR patients who achieved MCID in a specific PRO at Week 4, the proportion who continued improvement ≥MCID at Week 24 with baricitinib 2-mg vs. placebo were 66.3% vs. 40.5% ($p \leq 0.001$) for pain, 70.9% vs. 48.7% ($p \leq 0.01$) for HAQ-DI, 61.5% vs. 52.3% for FACIT-F, 71.8% vs. 40.4.% ($p \leq 0.001$) for MJS duration, and 63.0% vs. 40.4% ($p \leq 0.05$) for SF-36 PCS; and among csDMARD-IR patients were 81.5% vs. 61.9% ($p \leq 0.001$) for pain, 75.4% vs. 61.2% ($p \leq 0.05$) for HAQ-DI, 72.1% vs. 57.8% ($p \leq 0.05$) for FACIT-F, and 73.1% vs. 49.3% ($p \leq 0.01$) for SF-36 PCS. A similar trend was observed among patients who achieved MCID in each PRO at Week 12. An integrated long-term safety analysis up to 6.9 years showed a safety profile for baricitinib 2-mg consistent with earlier analyses in RA3.
Conclusion: Early clinically meaningful improvements in pain, physical function, fatigue, morning joint stiffness duration, and quality of life (physical component) continued to Week 24 with baricitinib 2-mg versus placebo in patients with active RA. Baricitinib 2-mg maintained a similar safety profile with longer exposure. No new safety signals were identified. 1. Smolen et al. Ann Rheum Dis. 2017;76(4):694-700. 2. Emery et al. RMD Open. 2017;3(1): e000410. 3. Genovese et al. Lancet Rheumatol. 2020;2(6):E347-E357.

TOUR08

Leveraging a Behaviour Change Model to Inform Key Elements for a National Implementation Plan of an Early Rheumatoid Arthritis (RA) Patient Decision Aid.

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Objectives: Despite the evidence to support the use of patient decision aids (PtDAs) to facilitate shared-decision making (SDM), they are rarely used in rheumatology practice. The objective of the study was to understand barriers to the use of PtDAs in rheumatoid arthritis (RA) within a behaviour change model to inform implementation strategies to improve SDM.
Methods: A qualitative approach was used to obtain perspectives from healthcare providers

(HCPs) and patients living with RA on a PtDA for patients with newly diagnosed RA. Participants reviewed the PtDA and provided their perspectives on perceived facilitators and barriers to PtDA implementation. Data was collected through semi-structured interviews which were transcribed and analyzed by inductive thematic analysis. The Themes were then mapped to the Behaviour Change Wheel COM-B system ("capability=C", "opportunity=O", and "motivation=M") by the researchers, an implementation scientist and 2 patient partners to inform key elements of a national implementation strategy for the PtDA.
Results: A total of 15 HCPs and 15 people living with RA participated in the qualitative interviews. Inductive thematic analysis yielded 5 major themes presented as "lessons learned" (COM-B mapping denoted for each "lesson" as C, O, M). Lesson 1 was that paternalistic decision-making is a dominant practice in early RA (C, M). Lesson 2 was that the current decision-making model was unable to address all of the needs of people living with RA at diagnosis (C, O). Lesson 3 was that implementing PtDAs at diagnosis to facilitate SDM may be difficult without reform of arthritis models of care (C, O). Lesson 4 was that flexibility was necessary for successful implementation given diversity of models of care (C, O) and Lesson 5 was that HCPs had limited interest in further training opportunities about PtDAs (M, O). Five main elements were identified for potential inclusion in a national PtDA implementation strategy: 1) making the PtDAs directly available to patients through patient-accessible websites and educational material; 2) creating a SDM rheumatology curriculum; 3) levering allied health resources as "decision coaches"; 4) linkage of PtDAs to "living" rheumatology guidelines; 5) designing future trials of SDM in rheumatology to evaluate patient-important outcomes.
Conclusion: A multifaceted strategy is suggested to improve uptake of SDM through the use of PtDAs and future work is ongoing in innovative SDM trial development. Supported by a CIORA grant.

TOUR09

The Effect of the Shared Epitope on an Animal Model of Atherosclerosis

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Objectives: Rheumatoid arthritis (RA) is associated with HLA-DR4 alleles encoding major histocompatibility II molecules containing a consensus sequence known as the Shared Epitope. The Shared Epitope binds strongly to citrullinated peptides leading to the production of anti-citrullinated protein/peptide antibodies (ACPA), which are highly specific for RA. Patients expressing ACPA are more likely to have joint erosions and RA complications, including cardiovascular disease (CVD). RA patients are at 1.5 times the risk of CVD compared to the general population and the risk is higher for patients who express HLA-DR4 and ACPA. The mechanisms by which HLA-DR4 and ACPA contribute to CVD risk in RA are unknown. The objective of this study is to generate a novel mouse model to study the role of HLA-DR4 in atherosclerosis.
Methods: Mice transgenic for human HLA-DR4 were cross-bred for 5 generations with LDL receptor knock-out (LDLR-/-) mice that are known to develop atherosclerosis when fed a high-fat high-cholesterol (HFHC) diet. Genotype was confirmed by PCR. Male and female DR4tgLDLR-/- mice (N=24) and controls: DR4tg (N=12), LDLR-/- (N=12) and wild-type B6 mice (N=12) were fed a HFHC diet or regular chow for 12 weeks and monitored for weight gain and joint swelling. Blood samples were analysed for serum lipoproteins using a colorimetric assay. Heart, aorta, liver and limbs were collected, and sections stained by haematoxylin and

eosin. Aortic plaque surface area was assessed by staining en face preparations of the aortas with SUDAN IV (stains lipids red).
Results: When fed a HFHC diet vs. regular chow, LDLR-/- and DR4tgLDLR-/- mice gained weight ($p<0.05$) and had evidence of fatty liver on histopathology. Serum LDL levels were significantly higher in HFHC-fed LDLR-/- vs. DR4tgLDLR-/- (1602mg/dL vs. 905.3mg/dL, respectively; $p=0.0056$), but the aortic plaque burden was similar for these two strains. B6 and DR4tg mice did not have any significant atherosclerotic plaque detected. None of the mice had detectable inflammatory arthritis.
Conclusion: In a mouse model of atherosclerosis, expression of HLA-DR4 led to lower levels of circulating LDL but a similar burden of atherosclerotic plaque, analogous to the RA lipid paradox where patients with lower LDL levels have high risks of CVD events.

TOUR10

Perceptions, Facilitators and Barriers of Physical Activity in Axial Spondyloarthritis: Results from a Qualitative Study

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Objectives: The benefits of physical activity (PA) are well known for preventing chronic disease, improving function, and increasing musculoskeletal and cardiorespiratory fitness. Despite these benefits, most Canadians fall short of PA targets. It is well established that PA is fundamental in the management of axial spondyloarthritis (axSpA); however, evidence indicates that people with axSpA are not adhering to recommended guidelines for sufficient PA participation. Given the importance of PA in managing axSpA, the objectives this study were to: 1) determine axSpA patients' definition of PA; 2) identify facilitators and barriers to PA engagement and 3) explore the importance of PA in the context of axSpA.
Methods: Semi-structured, key informant interviews were conducted with axSpA patients attending an urban academic outpatient rheumatology clinic. Interviews were conducted by telephone, audio recorded and transcribed verbatim. Data were analyzed using a thematic approach: two study investigators independently assigned themes and codes to the data set according to study objectives. Key informant recruitment continued until saturation of emergent themes was reached. Themes were presented to the investigative team to allow for comparison and reconciliation. Systematic labeling of the dataset was completed using an inductive approach. QSR NVivo V8 was used for data management and aggregation of codes into common themes.
Results: In total, 12 interviews were conducted. Most respondents were male (83.3%); mean age 45.5 (+/-12.5) years; mean disease duration 21.5 (+/-14.9) years. Approximately half were receiving biologic treatment (58.3%), mean Bath Ankylosing Spondylitis Disease Activity Index 2.5 (+/-1.4) and mean Bath Ankylosing Spondylitis Functional Index 1.8 (+/-1.9). Participants defined PA as any activity involving physical exertion including exercise and other activities (i.e., transportation, employment, housework and seasonal activities). Facilitators for PA engagement included intrinsic factors (symptom relief, impact on health and self-efficacy) and extrinsic factors (social support networks and facility access). Similarly, barriers to PA engagement included intrinsic factors (disease-related, fear of injury, and presence of comorbidities) and extrinsic factors (life demands, availability/time and environmental

restrictions). The role of PA in axSpA management was well recognized and included symptom relief, the evolution of benefits and the impact on mental and physical health.
Conclusion: The results of this study provide insight into patients' understanding of PA within the context of axSpA in terms of definition, facilitators/barriers, and its role in disease management. The above findings will be informative when applied to education and self-management programs aimed at increasing PA engagement in patients with axSpA. Supported by a CIORA grant.

TOUR11

The Long-Term Cardiac and Non-Cardiac Prognosis of Kawasaki Disease (KD): A Systematic Review

Jennifer Lee (University of Toronto, Toronto); Ethan Lin (University of Ottawa, Ottawa); Quenby Mahood (Hospital for Sick Children, Toronto); Jessica Widdifield (Sunnybrook Research Institute, ICES, University of Toronto, Toronto); Brian Feldman (The Hospital for Sick Children, Toronto)

Objectives: To examine long-term mortality, cardiac and non-cardiac prognosis of children following a diagnosis of Kawasaki Disease (KD)
Methods: A systematic literature search of Ovid Medline, Embase, Cochrane, and Clinicaltrials.gov was performed to identify studies from inception to June 2020. Included search terms were relevant to KD and prognosis, including mortality, major adverse cardiovascular events (myocardial infarctions (MI), stroke, and revascularization interventions), chronic cardiac conditions (hypertension, hyperlipidemia), and non-cardiac disease (including allergic diseases, infections, and systemic autoimmune diseases). Studies were eligible for data extraction if they met the following inclusion criteria: 1) human participants with KD, diagnosed <18 years old, 2) controlled trials or observational studies, 3) reported mortality or clinically relevant cardiac or non-cardiac outcome at least one year following KD, and 4) English studies. Extracted data included study design, population characteristics, follow-up duration and outcomes.
Results: From 4621 abstracts, we included 71 studies from 13 countries for full extraction. The majority of studies (76%) originated from East Asian countries. Fifty-seven (80%) studies were retrospective cohort studies, 6(9%) were case-control studies, 2(3%) were prospective cohort studies, and 6(9%) were cross-sectional studies. Twenty-three studies (32%) had 1-5 years follow-up, 22(31%) had 5-10 years follow-up, 17(24%) had 10–15-year follow-up, and 9(13%) reported >15-year follow-up. Thirty-one studies (44%) described mortality in 29,587 patients. Nine studies evaluated survival over time, with the mean 10-year, 20-year, and 30-year survival at 92%(SD:7), 89%(SD:7), and 81%(SD:14), respectively. Eight studies, derived from one cohort, compared the overall mortality rate of KD patients to the general population, and found no difference. Fifty studies (70%) described a cardiac outcome in 44,377 patients, of which the most frequently evaluated outcomes were MI (60%) and cardiovascular revascularization (44%). The prevalence of MI was 9% and the mean 10-year MI event-free probability was 73%(SD:24). Seven studies evaluated hypertension, of which 1 study suggested increased risk; 11 studies evaluated hyperlipidemia, of which 5 reported increased risk. Eleven studies (15%) described a non-cardiac outcome in 17,068 patients, including allergic diseases(n=5), infections(n=1), pregnancy(n=1), malignancy(n=1), ADHD(n=2), exercise performance(n=1), and vision(n=1). Four studies reported an increased risk of allergic diseases and 1 study reported an increased risk of malignancy.
Conclusion: Overall survival after KD appears to be favourable over a 30-year period. The majority of long-term studies evaluated major cardiac events like MI. There is insufficient

evidence on the risk of chronic cardiac and non-cardiac comorbidities such as hypertension, hyperlipidemia, and malignancy in KD. Several studies reported an increased risk of allergic diseases after KD diagnosis. Best Abstract By A Rheumatology Post-Graduate Research Trainee.

TOUR12

Disentangling the Web of Costs Associated with Juvenile Idiopathic Arthritis

Luiza Grazziotin (University of Calgary, Calgary); Marinka Twilt (Alberta Children's Hospital, Calgary); Gillian Currie (University of Calgary, Calgary); Michelle Kip (University of Twente, Enschede); Maarten Ijzerman (University of Melbourne, Melbourne); Deborah Marshall (University of Calgary, Calgary); UCAN CAN-DU Investigators Understanding Childhood Arthritis Network (Toronto)

Objectives: Juvenile idiopathic arthritis (JIA) is a chronic rheumatic disease affecting 1 in 1,000 children. The multifaceted care path for JIA can lead to significant expenditure for the healthcare system. There is a lack of real-world cost estimates for children diagnosed with JIA in Canada and we aim to assess these overall and JIA-associated costs.

Methods: A single center cohort of newly diagnosed JIA patients, attending the pediatric rheumatology clinic from 2011-2019 was identified using a validated JIA case ascertainment algorithm. Clinical variables were extracted from medical records and resource use was estimated from six administrative health databases, including hospital admission, emergency visits, ambulatory visits, practitioners' visits, drugs dispensation, and laboratory and imaging tests. Costs were assigned to each dataset using appropriate sources. We used descriptive statistics to summarise the overall and JIA-associated costs (JIA code as the main reason for the visit or procedure requested by the rheumatologist) as mean cost per patient (with 95% confidence intervals), standardized for a period of one year and stratified by subtype. Costs were adjusted for inflation and expressed in 2019 CAD.

Results: A total of 390 patients met the eligibility criteria. Oligoarticular and polyarticular JIA were the most common subtypes (36% and 36%, respectively), 60% female, and the median age was 10.9 years. The mean total overall and JIA-associated cost per patient for one-year time period was $ 10,465 (95%CI: $ 9,579-11,351) and $ 5,477 (95%CI: $ 4,901-6,053), respectively. Dispensed drugs, driven by use of biologic therapies, and outpatient visits were the greatest contributor to the total cost. The overall mean cost was constant over a six-year period from the first visit to the pediatric rheumatologist with practitioners and ambulatory care visits as the main cost drivers early on and then shifting with an increase in the proportion of drugs costs over time. Finally, systemic onset JIA had the highest mean overall cost ($ 20,172, 95%CI: $ 9,722-30,621), while oligoarticular arthritis had the lowest cost ($ 6,952, 95%CI: $ 5,946-7,959).

Conclusion: The care pathway for children diagnosed with JIA can be expensive, long, and complex – and varies by JIA subtype. Although the mean overall cost was stable, the change in the distribution of costs over time is explained by the introduction of biologic therapies later in the care pathway. This study provides better understanding of the JIA expenditure profile using a healthcare system perspective and can help inform future economic studies. Best Abstract By A Post-Graduate Research Trainee.

TOUR13

Implementation and Evaluation of a Pediatric Musculoskeletal Examination Curriculum for Pediatric Residents

Kate Neufeld (University of Saskatchewan, Saskatoon); Piya Lahiry (The Hospital for Sick Children, Toronto); Herman Tam (BC Children's Hospital, Vancouver); Shirley Tse (The Hospital for Sick Children, Toronto)

Objectives: Pediatric musculoskeletal (MSK) physical examination is underemphasized during resident training. Previous needs assessment demonstrates resident discomfort in performing MSK exams. A standardized, interactive approach with learner engagement, such as the pGALS (pediatric Gait Arms Legs Spine), has been suggested as ideal for MSK physical exam learning. The objective of this study was to assess whether a standardized pGALS curriculum would improve knowledge and confidence in performing a comprehensive screening pediatric MSK examination and improve detection of common MSK abnormalities in rheumatologic conditions at the PGY2 resident level.
Methods: Learners were second year pediatric residents on their rheumatology rotation between September 2019 to May 2020 at The Hospital for Sick Children. Educators were three pediatric rheumatology fellows. Self-efficacy (2 questions on a 10-point Likert scale) and knowledge (assessing detection of MSK abnormalities in 3 short answer questions, expressed as a percentage) were assessed using questionnaires pre- and post-rotation. Differences between mean pre- and post-rotation scores were examined using paired t-test with statistical significance of $P \leq 0.05$. The educational tools utilized were a standardized 15-minute pGALS instruction video and a modified pGALS checklist (scored out of 19) with 3 screenings questions and 16 physical exam maneuvers. Learners practiced pGALS throughout the rotation and were evaluated using the pGALs checklist. Competence-based evaluations (Elentra) were optional. Qualitative feedback was collected using open-ended questions.
Results: The curriculum was delivered to 9 learners (2 evaluated prior to creation of checklist). Pre-rotation (n=9) mean self-efficacy score was 4.2 and mean content knowledge score was 96.3%. Post-rotation (n=9) mean self-efficacy score was 7.8 and mean content knowledge score was 95.8%. Self- efficacy improved between pre- and post-rotation (difference of 3.6; p=0.0002), but mean content knowledge was not significantly different (-3.0%; p=0.59). The average pGALs checklist score post-rotation was 16.3/19 (85.5%, n=7). Additionally, 5 learners were evaluated using Elentra and 4 achieved 'autonomy' competence levels. Qualitatively, residents reported the teaching was effective, interactive, and they enjoyed the hands-on approach.
Conclusion: This novel implementation and evaluation of a standardized MSK teaching curriculum in a Canadian pediatric resident cohort demonstrates that a standardized pGALS curriculum improves learner self-efficacy in MSK physical examinations. Lack of difference in pre/post knowledge scores may be due to low level of difficulty of knowledge questions. This study suggests standardized and interactive MSK learning, and assessment should be incorporated into pediatric resident curriculums. Future directions may include increasing difficulty of knowledge questions, using a larger cohort and control group comparison.

TOUR14

Palliative Care for the Rheumatologist: An Educational and Patient Care Intervention

Charles Serapio (University of Toronto, Toronto); Leah Steinberg (University of Toronto, Toronto); Colman Rebecca (University of Toronto, Toronto); Alexandra Saltman (University of Toronto, Toronto)

Objectives: Patients with advanced systemic rheumatic diseases such as systemic sclerosis, inflammatory myositis and vasculitis often have a high burden of symptoms and limited life expectancy. However, these patients have limited access to palliative care (PC). The results of a survey sent out by the Canadian Rheumatology Association revealed that rheumatologists self-report discomfort with, and inadequate knowledge of, palliative care topics including how to engage in advance care planning and goals of care (ACP and GOC) conversations suggesting a

gap in training. This study assesses the impact of an education session designed for rheumatologists and trainees.
Methods: A group of rheumatologists and trainees participated in a didactic session and hands on practice with standardized patients based on a structured ACP and GOC Conversation Guide. A post-workshop survey assessed participants' practice patterns and the workshop's impact on participants' comfort with these conversations. Results were analyzed using descriptive statistics.
Results: 12 rheumatology faculty and trainees participated in the workshop and 8 completed the post-workshop survey. Of the participants who completed the survey, 63% (n=5) reported that 5% or more of inpatients that they cared for had advanced rheumatologic diseases with significant functional limitation and/or an estimated prognosis of less than 1 year. 88% (n=7) felt that the workshop was useful to their clinical practices. 75% (n=6) reported that they will be more comfortable in engaging in goals of care conversations with patients following the workshop. 63% (n=5) reported that the workshop raised awareness of the importance of PC for patients with life-limiting systemic rheumatic diseases. 63% (n=5) reported that the insights acquired will facilitate challenging aspects of patient care.
Conclusion: We piloted and evaluated a rheumatology-specific advance care planning and goals of care conversation training module delivered to rheumatology residents and faculty. Preliminary results point to participants' increased comfort with these conversations and increased awareness of PC's role for patients with end-stage rheumatologic conditions. Further study on a larger scale is required to better assess the value of such educational interventions.

TOUR15

Effective, Efficient, and Convenient: Examiner and Examinee Experiences with a National Virtual Objective Structured Clinical Examination (OSCE) in a Rheumatology Competence By Design Curriculum

Leah Ellingwood (University of British Columbia, Vancouver); Azin Ahrari (UBC, Vancouver); Raheem Kherani (University of British Columbia, Richmond); Shahin Jamal (Division of Rheumatology, University of British Columbia, Vancouver)

Objectives: To assess feasibility and resident examinee and faculty examiner experiences of a national virtual Objective Structured Clinical Exam (OSCE) of Canadian Rheumatology residents.
Methods: In July 2020 during the COVID-19 pandemic, we administered a virtual OSCE for incoming Rheumatology residents using Zoom technology following a 3-day virtual Rheumatology Basic Skills Course. The virtual OSCE was comprised of four history, counselling, or management stations assessing Competence by Design curriculum Entrustable Professional Activities. Post-OSCE, we distributed voluntary anonymous online surveys to resident examinees and faculty examiners with 5-point Likert scale questions on experiences of the virtual OSCE as a method of learning and assessment and free-text questions on the advantages and limitations of virtual versus in-person OSCEs. Likert responses were analyzed using descriptive statistics, and open-ended questions were analyzed with thematic analysis.
Results: Twenty-two resident examinees (N=22) and six faculty examiners (N=6) completed the surveys. All residents (100%, n=22) and faculty (100%, n=6) strongly agreed that the online technology was easy to use. All residents (100%, n=22) and most faculty (83%, n=5) somewhat or strongly agreed that the virtual OSCE was helpful preparation for telehealth appointments. The majority of residents (95%, n=21) and all faculty (100%, n=6) somewhat or strongly agreed that they were able to effectively demonstrate/evaluate clinical skills and knowledge in a virtual

setting. Most residents (95%, n=21) and faculty (83%, n=5) either somewhat or strongly agreed that compared to an in-person OSCE, a virtual OSCE is a practical and useful evaluation tool. Most residents (77%, n=17) somewhat or strongly agreed that their performance was comparable to how they would have performed on an in-person OSCE. Responses to whether it would be easy to cheat on this virtual exam varied, with 54% (n=12) of residents and 33% (n=2) of faculty somewhat or strongly disagreeing; half of faculty (n=3) neither agreed nor disagreed. Qualitative feedback from residents and faculty emphasized the convenience, efficiency, comfort, and accessibility of the virtual format. Perceived limitations included inability to evaluate physical exam skills and potentials for cheating or technical issues.
Conclusion: Rheumatology residents and faculty perceived the virtual OSCE to be an effective, convenient, and practical evaluation tool. Virtual OSCEs thus may enable formal evaluation when physical distancing is required for public health reasons or when geographic proximity is challenging or unfeasible. Further research into approaches to mitigate cheating and facilitate physical examination skills assessment in the virtual format would be beneficial.

TOUR16

National Burden of Rheumatoid Arthritis in Canada 1990-2017: Findings from the Global Burden of Disease Study 2017

Nejat Hassen (University of British Columbia, Arthritis Research Canada, Richmond); Diane Lacaille (University of British Columbia (Division of Rheumatology)/ Arthritis Research Canada, Richmond); Nizal Sarrafadegan (University of British Columbia, Vancouver); Alice Xu (University of British Columbia, Vancouver); Sophia Sidi (University of British Columbia, Vancouver); Amani Alandejani (University of British Columbia, Vancouver); Marjan Mansourian (Isfahan University of Medical Sciences, Isfahan); Jacek Kopec (Arthritis Research Canada, Richmond)

Objectives: According to the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2017, over 120,000 individuals currently have rheumatoid arthritis (RA) in Canada, yet a study that evaluates the combined effect of RA on the longevity and quality of life in the country is lacking. The objectives of this study are three: 1) to describe burden of RA levels and trends from 1990-2017 using GBD data, 2) to describe age and sex differences, and 3) to compare Canada RA burden to other countries.
Methods: We obtained publicly available data from GBD Study 2017 from the Institute for Health Metrics and Evaluation interactive visualization tool (http://vizhub.healthdata.org/gbd-compare). Disease burden indicators include prevalence, mortality, years of life lost (YLLs), years lived with disability (YLDs), and disability-adjusted life years (DALYs). Estimates were presented as non-age-standardized and age-standardized rates per 100,000 population. GBD estimated mortality and prevalence using published literature, survey data, patient records, and health insurance claims. YLLs measure premature death calculated as the sum of each death multiplied by the standard life expectancy at each age. YLDs measure amount of time in a year an individual lives with a short- or long-term health condition, calculated by combining RA prevalence with disability weights for each age/sex/year. DALYs were calculated as the sum of YLLs and YLDs. DALYs for Canada were compared to DALYs of countries with similar socio-demographic index (SDI) values. SDI combines income per capita, average educational attainment, and fertility rates. Data were analysed by DisMod-MR 2.1, a Bayesian meta-regression tool.
Results: In Canada, RA mortality (mortality and YLLs) has improved over time, with a steeper decline after the year 2002. However, the population burden of quality of life (YLDs and

DALYs) has increased due to increasing prevalence. The disease burden was higher in females (prevalence, mortality, YLLs, YLDs, DALYs), and DALY rates were higher among older populations. Compared to other countries, Canada had a greater improvement in mortality and YLLs over time and had a lower age standardized DALYs rate compared to countries of similar SDI values. A weak association was found between global age standardized DALYs and SDI ($R2 = 0.0138$).

Conclusion: RA is a major public health challenge. Canada fairs better than other countries with regards to national RA burden. Early identification and management are critical to reducing the overall burden of RA in Canada, especially in women. More data from multiple provincial RA databases would increase the accuracy of our estimates for Canada.

TOUR17

The Effect of Targeted Rheumatoid Arthritis Therapeutics on Systemic Inflammation and Anemia

Anthony Padula (Northern California Arthritis Center, Walnut Creek); Dimitrios Pappas (Corrona, Waltham); Stefano Fiore (Sanofi, Bridgewater); Taylor Blachley (Corrona, Waltham); Kerri Ford (Sanofi, Cambridge); Kelechi Emeanuru (Corrona, Waltham); Joel Kremer (Corrona, Waltham)

Objectives: Anemia and inflammation associated with RA may have considerable impact on patient functionality and quality of life. We evaluated the effects of the TNF inhibitors (TNFi), IL-6 receptor inhibitors (IL-6Ri), and Janus kinase inhibitors (JAKi) on the levels of hemoglobin (Hb) and CRP after 6 months of therapy in adults enrolled in Corrona, a large US RA registry.

Methods: We selected patients who initiated a TNFi, IL-6Ri, or JAKi during or after January 2010, had valid Hb and CRP measurements at both baseline and 6 (±3) months of follow-up, and had continued therapy until at least that follow-up visit. For both parameters, outcomes included mean concentration changes and proportions of patients who switched from abnormal (Hb: <12 g/dL (women) or <13 g/dL (men); CRP: ≥0.8 mg/L) to normal levels, and vice versa, from baseline to Month 6. We also assessed the proportions of patients who had a mild (≤1.5 g/dL) or moderate or worse (>1.5 g/dL) Hb decrease. Differences in these outcomes were evaluated using covariate-adjusted multivariable regression models.

Results: This analysis included 2772 patients (TNFi, 65%; IL-6Ri, 17%; JAKi, 17%). Overall, 17% patients had low Hb and 38% had elevated CRP. By Month 6, 32-34% patients across the three groups discontinued treatment. The IL-6Ri group had the highest Hb increase (0.44 ± 1.06 g/dL), which was significantly greater than those observed with TNFi (0.12 ± 0.95 g/dL) and JAKi (-0.09 ± 0.94 g/dL), regardless of Hb status at baseline. In addition, IL-6Ri was associated with significantly higher odds of attaining normal Hb than TNFi or JAKi (odds ratios 3.25 and 3.85, respectively) and with significantly lower odds of experiencing mild (0.55 and 0.36) or moderate or worse Hb decrease (0.67 and 0.36). Similarly, IL-6Ri was associated with a significant improvement from baseline to Month 6 in CRP level over TNFi and JAKi and with significantly higher odds of attaining a normal CRP. Greater improvements in Hb and CRP with IL-6Ri compared with TNFi and JAKi were also observed for patients with low Hb or high CRP at baseline.

Conclusion: In this real-world completer analysis of patients with RA, continuous 6-month therapy with IL-6Ri was associated with improvements in Hb and CRP, which were significantly greater than those with continuous 6-month therapy with TNFi or JAKi. These results align with the mechanism of IL-6R inhibition and may be useful when considering treatment options for patients with RA.

TOUR18

What are the Real-World Predictors of Initiating Different Advanced Therapies in Early RA? Data from the Canadian Early Arthritis Cohort (CATCH) Group.

Madina Weiler (Schulich School of Medicine and Dentistry, Western University, London); Orit Schieir (University of Toronto, Notre-Dame-de-Grace); Marie-France Valois (McGill University, Montreal); Susan Bartlett (McGill University, Montreal); Louis Bessette (Laval University, Quebec); Gilles Boire (Université de Sherbrooke, Sherbrooke); Glen Hazlewood (University of Calgary, Calgary); Carol Hitchon (University of Manitoba, Winnipeg); Edward Keystone (University of Toronto, Toronto); Diane Tin (Southlake Regional Health Centre, Newmarket); Carter Thorne (Southlake Regional Health Centre, Newmarket); Vivian Bykerk (Hospital for Special Surgery, New York); Janet Pope (University of Western Ontario, London); CATCH Canadian Early Arthritis Cohort Investigators (Toronto)

Objectives: Compare the characteristics of real-world early RA (ERA) patients who are starting TNFi, non-TNFi, and JAKi post failure of conventional synthetic disease modifying antirheumatic drugs (csDMARDs).

Methods: Prospective cohort data analyzed from early RA patients (symptoms <1 year) enrolled in CATCH starting TNFi, non-TNFi or JAKi as first line advanced therapy between January 2014 (when JAKi were first approved in Canada) to December 2019. Descriptive statistics, t-tests and chi-square tests summarized and compared secular trends and patient characteristics initiating each class of therapy. Multinomial logistic regression identified predictors of starting non-TNFi vs TNFi, or JAKi vs TNFi as first advanced therapeutic.

Results: 246 participants started advanced therapy during the study period, mean (SD) age 50(14) years, 75% female, and 79% Caucasian. The proportion of JAKi used as first-line therapy increased over time (0% to 33% from 2014-2019) and TNFi decreased (87% to 61%). The following findings are from the visit just prior to starting advanced therapy. Those starting JAKi, had the lowest DAS28 (mean [SD]: 3.6[1.4]; p=0.001), CDAI (16.5[13.7]; p=<0.009), MD global (3.2[2.7]; p=0.003), ESR (median [IQR]: 12[13]; p=<0.05), and tender joint count (median [IQR]: 2[6]; p=0.02). Reciprocally, those starting non-TNFi had the highest DAS28 (mean [SD]: 4.8[1.5]; p=0.001), CDAI (24.8[14.9]; p=<0.009), MD global (4.8[2.8]; p=0.003), ESR (median [IQR]: 28[23.5]; p=<0.05), and tender joint count (median [IQR]: 6[9]; p=0.02). Those starting TNFi had the shortest disease duration in months (mean [SD]: 32.5[29.1]; p=0.0006), and the highest proportion of non-Caucasian participants (26%; p=0.02). There were no statistically significant differences between the groups for proportion of women, annual household income, employment status, private medical insurance, or RF positivity in the first year. Comparing JAKi vs TNF, the strongest predictor of initiating JAKi was province of Ontario where access is preferential for JAKi and TNFi, versus Quebec (OR [95% CI]: 0.44 [0.20, 0.94]), or Western Canada (0.11 [0.01, 0.99]). Comparing non-TNFi to TNFi, those prescribed non-TNFi were associated with grade 12 or higher education (2.92[1.28, 6.63]). Non-TNFi were also associated with more comorbidities at baseline (1.35[1.01, 1.81] and trended towards older age (1.01[0.97, 1.05]).

Conclusion: Both patient-related factors and physician-related factors were associated with different choices of advanced DMARD. Patient formal education beyond high school was the strongest predictor of starting non-TNFi compared to TNFi. Physician practice location within Ontario was the strongest predictor of starting JAKi compared to TNFi. Finally, JAKi use is increasing as first-line advanced therapy after csDMARD failure.

TOUR19

Patient Characteristics and Treatment Patterns Across Four Canadian Rheumatoid Arthritis Cohorts

Glen Hazlewood (University of Calgary, Calgary); Claire Bombardier (University of Toronto, Toronto); Xiuying Li (University Health Network, Toronto); Mohammad Movahedi (University Health Network, Toronto); Denis Choquette (Institut de Rhumatologie de Montréal, Montréal); Louis Coupal (Institut de Rhumatologie de Montréal, Montréal); Vivian Bykerk (Hospital for Special Surgery, New York); Orit Schieir (University of Toronto, Notre-Dame-de-Grace); Dianne Mosher (University of Calgary, Calgary); Deborah Marshall (University of Calgary, Calgary); Sasha Bernatsky (McGill University Health Centre, Montreal); Nicole Spencer (University of Calgary, Calgary); Claire Barber (University of Calgary/Arthritis Research Canada, Calgary); OBRI (University Health Network, Toronto); RHUMADATA® (Montreal); CATCH Canadian Early Arthritis Cohort (Toronto); on behalf of the Rheum4U Team (Calgary)

Objectives: To describe and compare the clinical characteristics and treatment patterns of patients with rheumatoid arthritis (RA) across 4 Canadian cohorts.

Methods: We used data from four RA Canadian longitudinal cohorts in our analyses: The Canadian Early Arthritis Cohort (CATCH), a national inception cohort of patients with early RA (n=2878); Ontario Biologics Registry Initiative (OBRI), an Ontario cohort of patients with RA enrolled at the time of a treatment switch to either a non-biologic DMARD or advanced therapy (biologic of JAK inhibitor) (n=3734); the Quebec cohort RHUMADATA® (n=2890), and The Calgary Rheum4U Precision Health Registry (n=709), which both enroll patients with RA at any stage of disease. Each cohort conducted their own analyses, which were supervised and standardized through a central team. All data was complete up to Jan-Sept 2020. Clinical characteristics and treatment patterns were summarized descriptively and compared between the cohorts.

Results: A total of 10,213 patients with RA were included across the 4 cohorts. Overall, the percentage of patients who entered the cohort with early RA was 63% but ranged from 29% (Rheum4U) to 100% (CATCH), depending on the eligibility criteria. Mean age (55 years), gender (75% female) and seropositivity (69%) were similar between cohorts. At the time of initial DMARD, disease activity scores (DAS-28) varied, ranging from 3.00 (Rheum4U) to 5.17 (CATCH), but were more similar at the time of the first DMARD switch (range:3.54-4.93), first advanced therapy (range:4.23-4.62) and second advanced therapy (range:3.59-4.32). The initial DMARD was most commonly methotrexate, either in monotherapy (32%, range:18%-40%), dual therapy (34%, range:32%-46%), or triple therapy (3%, range: 1%-10%). Hydroxychloroquine monotherapy as initial DMARD varied from 14% (OBRI) to 29% (RHUMADATA®). The first DMARD switch was to another DMARD monotherapy in 20% (range:10%-22%), dual therapy in 49% (range:39%-56%) triple therapy in 6% (range:2%-20%) and advanced therapy in 24% (range:15%-28%). The first advanced therapy was a TNF inhibitor in 80% (range:78%-82%). Of the 2892 patients who ever started an advanced therapy across the 4 cohorts, 52% were on their first, 22% on their second and 12% on their third and 13% on their fourth or greater.

Conclusion: Canadian RA cohorts that include over 10,000 patients across a range of settings demonstrate some heterogeneity in treatment patterns. This project is a first step towards future efforts to conduct harmonized analyses across Canadian RA cohorts.

TOUR20

Biologic Refractory Rheumatoid Arthritis: A Report From the Rheumatoid Arthritis Pharmacovigilance Program and Outcomes Research in Therapeutics (RAPPORT)

Database

Britney Jones (University of Alberta, Edmonton); Stephanie Keeling (University of Alberta, Division of Rheumatology, Edmonton); Joanne Homik (University of Alberta, Edmonton); Sasha Bernatsky (McGill University Health Centre, Montreal); Walter Maksymowych (Department of Medicine, University of Alberta, Edmonton); Luck Lukusa (Montreal); Jill Hall (University of Alberta, Edmonton)

Objectives: Advances in therapy have provided more options for patients with rheumatoid arthritis (RA) who do not improve on initial therapy. However, there still remains a significant proportion of patients with refractory RA, defined as those who progress to a third class of advanced therapy (biologic or targeted synthetic DMARD). Previous studies have estimated that between 6-20% of patients are refractory, thus early identification of this population could alter initial treatment strategy and help focus resources. Our objective was to identify baseline characteristics of patients who later developed refractory RA.

Methods: The Rheumatoid Arthritis Pharmacovigilance Program and Outcomes Research in Therapeutics (RAPPORT) registry is a prospective inception cohort in Northern Alberta that captures data on RA patients since 2000 starting advanced therapy after at least 4 months of exposure to conventional synthetic DMARDs. We compared baseline demographic and disease characteristics of patients with and without refractory RA. We then performed time-to-event multivariate hazard ratio (HR) analyses to compare the outcomes of the two groups.

Results: We observed 2341 patients for 14012 patient-years (mean follow-up 6.0 years, median follow-up 5.1 years; IQR: 2.2, 9.2), 274 (11.7%) of patients were refractory. Baseline characteristics were similar between the non-refractory and refractory RA groups: mean age (years (SD) 44 (15) vs 43 (14)), female 73% vs 75%, mean RA duration (years (SD) 10 (10) vs 10 (11)), ever smokers 58% vs 58%, BMI >30 23% vs 25%. The number of patients with severe functional loss on HAQ was 30% vs 36% and high disease activity on DAS28-CRP was 31% vs 41%. Multivariate HR analyses of baseline characteristics showed higher rates of unemployment (HR 1.45; 95%CI 1.03, 2.06), prednisone use (HR 1.76; 95%CI 1.18, 2.63) and entry into the RAPPORT database after 2011 (HR 2.26; 95%CI 1.52, 3.35). There were no significant differences in ethnicity, smoking status, seropositivity, type of b/tsDMARD, or objective markers of active disease including HAQ, CDAI, or DAS28-CRP.

Conclusion: At the point of b/tsDMARD initiation, we identified very few robust predictors of refractory disease. There was a significant shift after 2011 in the number of patients with refractory RA. This may reflect a change in practice patterns toward treat-to-target or simply the wider variety of treatment options available. Further work to evaluate the impact of switching between b/tsDMARDs according to evolving definitions of refractory disease on patients and society is planned.

TOUR21

Characterization of Remission in Patients with Psoriatic Arthritis Treated with Upadacitinib: Post-hoc Analysis from Two Phase 3 Trials

Dafna Gladman (Krembil Research Institute, Toronto Western Hospital, Toronto); Arthur Kavanaugh (University of California, San Diego); Oliver FitzGerald (St Vincent's University Hospital, Dublin); Enrique Soriano (Department of Public Health, Instituto Universitario, Escuela de Medicina Hospital Italiano de Buenos Aires, Rheumatology Unit, Internal Medicine Services, Hospital Italiano de Buenos Aires, Buenos Aires); Peter Nash (University of Queensland, Brisbane); Dai Feng (AbbVie Inc., North Chicago); Apinya Lertratanakul (AbbVie Inc., North Chicago); Kevin Douglas (AbbVie Inc., North Chicago); Ralph Lippe (AbbVie

Deutschland GmbH & Co. KG, Wiesbaden); Laure Gossec (Sorbonne Université and Rheumatology Department, Hôpital Pitié Salpêtrière, Paris); Philip Mease (University of Washington, Seattle)

Objectives: To assess the rates of patients achieving remission or low disease activity (LDA) based on very low/minimal disease activity (VLDA/MDA) measures, DAPSA and PASDAS scores at Weeks 12 and 24 using data from the SELECT-PsA 1 and SELECT-PsA 2 Phase 3 studies. Individual MDA components among patients who did or did not achieve MDA criteria at Week 24 were also assessed.

Methods: This is a post-hoc analysis of 2 randomized controlled trials. In SELECT-PsA 1, patients with PsA and prior inadequate response (IR) or intolerance to ≥1 non-biologic DMARD (N=1705) were randomized to once daily upadacitinib (UPA) 15mg (UPA15), UPA 30mg (UPA30), adalimumab (ADA) 40mg every other week, or placebo (PBO). In SELECT-PsA 2, patients with prior IR or intolerance to ≥1 biologic DMARD (N=642) were randomized to UPA15, UPA30, or PBO. Remission and LDA were assessed using VLDA/MDA, DAPSA scores of ≤4/≤14, and PASDAS scores of ≤1.9/≤3.2, at Weeks 12 and 24.

Results: Overall, 2345 patients were analyzed. In both studies, higher rates of remission and LDA were observed with both UPA doses vs PBO at Weeks 12 and 24 (nominal P-values <0.05). Generally, higher rates of remission and LDA were also observed with UPA30 vs ADA in non-biologic DMARD-IR patients (nominal P-values <0.05). Greater rates of MDA/VLDA were observed at Weeks 12 and 24 with UPA15 and UPA30 vs PBO in both studies and with UPA30 vs ADA in non-biologic DMARD-IR pts (nominal P-values <0.05 for all comparisons). The proportion of responder or non-responder patients receiving UPA15 or UPA30 was similar for each of the MDA components in both studies. At Week 24, more responder and non-responder patients in both studies achieved SJC 66 ≤1, PASI ≤1 or BSA-Psoriasis ≤3%, and Leeds Enthesitis Index (LEI) ≤1. Conversely, the proportion of patients Achieving TJC 68 ≤1 and Patient's Global Assessment of Pain ≤1.5 tended to be lower.

Conclusion: Regardless of previous biologic DMARD failure, patients treated with UPA15 or UPA30 achieved a higher rate of remission or LDA measured by various disease activity measures vs PBO at Weeks 12 and 24; higher rates of response were observed in most of the remission and LDA measures with UPA30 vs ADA in non-biologic DMARD-IR patients. Among patients who did or did not achieve MDA criteria at Week 24, a greater proportion of UPA-treated patients achieved physician derived measures such as SJC ≤1, PASI ≤1 or BSA-Ps ≤3%, and LEI ≤1.

TOUR22

Shared Decision-Making for Inflammatory Arthritis Treatment Decisions: Preferences of Indigenous Patients

Valerie Umaefulam (University of Calgary, Calgary); Terri-Lynn Fox (University of Calgary, Calgary); Cheryl Barnabe (University of Calgary, Calgary)

Objectives: Decision making for treatment of inflammatory arthritis is complex, with multiple beneficial medication options and approaches available, but with the potential for treatment-related adverse effects and economic considerations. Shared decision-making (SDM) is a process where health professionals and patients use specific tools and approaches in working together to make informed healthcare decisions and choices and is associated with improved patient involvement and satisfaction with care. Indigenous patients experience a significant burden of inflammatory arthritis, both in increased prevalence and differential treatment outcomes relative to the general population. Treatment decisions reflect an interplay of clinical, family, and societal

factors. SDM may represent an approach to support these decisions in a culturally congruent and safe manner. The study aimed to identify aspects of inflammatory arthritis care that Indigenous patients find relevant for shared decision-making and explore preferences for shared decision-making strategies.
Methods: A purposive sampling process from rheumatology clinics that provide services to Indigenous patients in Calgary was used to recruit patients to participate in semi-structured interviews. Interview guides were developed to discuss patient's perceptions about the potential role of SDM in arthritis care, priorities for application of SDM, and preferences for SDM strategies. The interviews were reviewed and coded by two individuals, including a First Nations patient with inflammatory arthritis, and the data was analyzed via thematic analysis using NVivo software.
Results: Seven participants were recruited to reach content saturation. They were all women aged 37-61 years, living with rheumatoid arthritis. Participants supported that SDM would be beneficial, primarily to support decisions around treatment plans and medication changes, managing arthritis comorbidities and complications, and the inclusion of traditional modes of healing in care plans. SDM would need to reflect specific content areas, such as available treatments for arthritis and side effects, which medication options would be covered by the federal formulary (Non-Insured Health Benefits), and how the treatment decisions would impact quality of life, especially while living with other comorbidities and social realities. All participants were interested in a SDM strategy that involved having a decision coach and preferred an approach that used a combination of paper and electronic resources and support groups.
Conclusion: Indigenous patients' value active engagement in decision making for arthritis care. This study advances knowledge in the priority areas and specific content needed in the SDM process, and the preferences of SDM strategies relevant and appropriate for Indigenous patients living with inflammatory arthritis.

TOUR23

Secukinumab Dose Escalation for the Treatment of Ankylosing Spondylitis in Canada: Retrospective Analysis Using Real-World Data from the XPOSE Patient Support Program

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Objectives: Secukinumab is a fully human monoclonal antibody targeting interleukin-17A, approved for AS treatment. At the recommended dose of 150 mg monthly, secukinumab showed a 5-year sustained improvement in signs/symptoms and favorable safety profile in the MEASURE trials. Dose escalation (DE), defined as an increase in dose and/or shortening of dose interval vs. initial dosage, has been previously described for biologics in AS. It constitutes a patient-centric approach to treatment optimization before considering therapy switch. The current analysis leverages the Patient Support Program (PSP) data to describe the demographics, baseline disease characteristics, drug retention rate (DRR) and effectiveness of secukinumab in AS patients who underwent DE.
Methods: The XPOSE® PSP is available to Canadian AS patients initiated on secukinumab. Patient demographics, previous biologic therapy, dosage/dates and BASDAI were collected to

support reimbursement. We present a retrospective analysis in patients who received ≥1 dose of secukinumab between 20-Apr-2016 and 2-May-2019, and for whom dosage/dates were adequately captured. We report DRR at 12-month post-DE and BASDAI responses in different DE cohorts.
Results: Among 1,895 qualifying patients, 642 received DE. The mean (SD)/median times to DE were 227.7 (179.6)/160 days post-secukinumab initiation. In DE patients, mean age was 45.4 years, 13.9% were biologic-naive and 54.8% female. The corresponding figures in non-DE patients were 46.1 years, 22.2% and 50.0%. For patients with recorded BASDAI scores (n=1,483), mean (SD)/median baseline BASDAI were 7.1 (1.60)/7.4 in DE patients (n=490) vs. 6.9 (1.69)/7.0, in non-DE patients (n=993). Most frequently prescribed DE regimens were 300 mg monthly (68.9%), 150 mg every 2 (17.6%) and every 3 weeks (9.4%). In DE patients, DRR 12-month post-DE was 67.4% (196/291). A similar DRR was observed in non-DE biologic-naive patients (71.2%, 74/104) 12-month post-initiation. In a DE cohort (n=68) with BASDAI available pre-secukinumab initiation and post-DE (mean time to post-DE F/U=188.9 (77.0) days), BASDAI decreased from 7.18 (1.36) to 4.43 (1.76). In another DE cohort with BASDAI available pre-DE (within 3 months) and post-DE (n=23), DE was associated to a 1.32 points reduction (from 5.60 (1.95) to 4.28 (1.86)).
Conclusion: We herein report a characterization of DE practices amongst Canadian physicians treating AS with secukinumab. Looking at baseline characteristics, DE patients were more frequently bio-experienced and had slightly higher BASDAI scores. For post-intervention outcomes, when deemed clinically relevant by the physician, DE was successful in a majority of cases, leading to appreciable disease activity improvement and 12-month retention in over 2/3 of patients.

TOUR24

Can Relapses after 12 Month Follow-up be Predicted using Disease Status and Characteristics at Month 12 in Patients with Granulomatosis with Polyangiitis?

Lindsay Cho (University of Toronto, Toronto); Simon Carette (University of Toronto, Toronto); Christian Pagnoux (Vasculitis Clinic, Canadian Network for Research on Vasculitides (CanVasc), Division of Rheumatology, Mount Sinai Hospital, University of Toronto, Toronto)
Objectives: Previous studies have identified proteinase 3 (PR3)- antineutrophil cytoplasmic antibody (ANCA) positivity at diagnosis and remission, and persistent hematuria at remission as risk factors for relapse in ANCA-associated vasculitis, but with more controversial results in granulomatosis with polyangiitis (GPA). This study sought to analyze the predictive value of positive ANCA status and persistent microhematuria at 12-month follow-up on subsequent relapses in a cohort of GPA patients followed at the Toronto vasculitis clinic.
Methods: Data from patients with GPA followed at the Toronto vasculitis clinic were extracted from the CanVasc database and included demographics, clinical, and biological data at diagnosis and follow-up month 12 ± 3 (M12). Relapse was defined as recurrence or new onset of disease due to active vasculitis after a period of remission, requiring a change in dose of glucocorticoids and/or the addition of another immunosuppressant. The association between independent parameters and relapses after M12 were assessed using Cox proportional hazard models.
Results: Of the 234 GPA patients in the database, 113 patients were included (118 patients had no ANCA serology at 12 ± 3 months follow-up and 3 patients had follow-up period of less than 24 months). The demographics and disease characteristics of the 50 ANCA+ and 63 ANCA- patients at M12 were similar, including the treatments used for induction and at M12. A significantly higher proportion of patients who were ANCA- at M12 had a previous relapse

(prior to M12) compared to patients ANCA+ at M12 (P=0.03). However, between the two groups there was no significant difference in the number of patients experiencing a relapse after M12. In multivariate analyses, MPO-ANCA positivity at M12 was the strongest of the only two identified parameters predictive of subsequent relapses after M12 (HR 3.54, P=0.01), along with the presence of microhematuria at M12 (HR 1.91, P=0.04). Elevated serum creatinine levels at M12 were associated with a decreased risk of relapse after M12 (HR 0.99, P=0.04).
Conclusion: These findings suggest that in GPA patients, the presence of MPO-ANCA positivity at M12 or microhematuria at M12 are associated with more subsequent relapses, and thus are important parameters to follow.

TOUR25

Radiological Validation of a Novel MRI Reporting System for Axial Spondyloarthritis

Sandeep Dhillon (McMaster University, Hamilton); Raj Carmona (McMaster University, Hamilton); Euan Stubbs (McMaster University, Hamilton); Nader Khalidi (McMaster University, St Joseph's Healthcare Hamilton, Hamilton); George Ioannidis (McMaster University, Hamilton); Rana Kamhawy (McMaster University, Hamilton); Karen Beattie (McMaster University, Hamilton); John O'Neill (McMaster University, Hamilton)

Objectives: The diagnosis of axial spondyloarthritis (SpA) can be challenging, resulting in increasing use of magnetic resonance imaging (MRI). Often, however, bone marrow edema (BME) on MRI alone, rather than a global radiologic assessment, is mistakenly used to arrive at an imaging diagnosis. Given this, our group proposed a novel classification system for MRI reporting of the sacroiliac joints (SIJ) in a recent publication (O'Neill J, Carmona R, Maksymowych W. Clinical Radiology, 2019). Beyond standardising MRI reporting, the novel system reminds radiologists and clinicians that BME alone does not constitute a diagnosis of axial SpA, allows room for uncertainty, and provides a framework for communication between physicians. This study aims to validate this novel reporting system. A separate study is being conducted to assess the impact on clinical practice.
Methods: In this retrospective review we identified 100 patients ≥18 years old, who had spondylitis MRI protocol (n=5 for initial pilot study, n=95 for full analysis) ordered by two rheumatologists for suspected SpA from 2012 to 2018. Two rheumatologists retrospectively applied the novel classification system to the original MRI reports. Two MSK radiologists, blinded to initial imaging diagnosis, completed a separate reading of the MRI images to generate a new report based on the novel classification system. A comparative assessment of the old and new reports was performed to assess the quality of the new framework and quantify the effect on imaging diagnosis and change in classification.
Results: All MRI's have been re-interpreted using the new system. Of the 5 pilot study patients, the original MRI reports of 2/5 patients were interpreted as class 4C (acute-on-chronic sacroiliitis) by the rheumatologists. Utilizing the new classification system, the radiologists re-classified 1 of these as class 2, indicating an alternate diagnosis. In the patient who remained as 4C, cervical imaging aided in the diagnosis. Of 4 patients without sacroiliitis utilizing the new system, spinal imaging helped in arriving at an alternate diagnosis. The full data set will be presented at the CRA-ASM in February 2021.
Conclusion: We present a new MRI classification system for reporting in axial SpA. Our preliminary assessment revealed a reclassification of MRI diagnosis of 1/5 (20%) patients. Adding spinal imaging contributed to the diagnosis of these patients. The full data set validating this new reporting system, as well as data describing the utility of adding spinal MRI to MRIs of the SI joints will be examined and presented at the CRA meeting. Best Abstract on

Spondyloarthritis Research Award.

TOUR26

Changes in Disease Features Do Not Differ Between SSc Patients Who Did versus Did Not Undergo Annual PAH Screening: Data from the Canadian Scleroderma Research Group Registry

Curtis Sobchak (McMaster University, Hamilton); Sandeep Dhillon (McMaster University, Hamilton); Jessica Kapralik (McMaster University, Hamilton); Nader Khalidi (McMaster University, St Joseph's Healthcare Hamilton, Hamilton); Nathan Hambly (McMaster University, Hamilton); Gerard Cox (McMaster University, Hamilton); Karen Beattie (McMaster University, Hamilton); Maggie Larche (McMaster University, St Joseph's Healthcare Hamilton, Hamilton); Canadian Scleroderma Research Group (CSRG) (Montreal)

Objectives: Pulmonary arterial hypertension (PAH) has a high mortality in systemic sclerosis (SSc) patients despite available therapies. Guidelines recommend annual echocardiograms to assess for PAH. However, it is unknown whether annual screening improves disease progression and outcomes. Using data from the Canadian Scleroderma Research Group (CSRG) database, we compared characteristics in pulmonary function, cardiac function and skin manifestations between SSc patients who did versus did not undergo annual echocardiograms for PAH screening over the duration of registry follow-up.

Methods: Data was obtained from the CSRG, a national longitudinal registry of SSc patients >18 years old. All patients with ≥3 visits (baseline plus ≥2 follow-ups) were included. We considered a patient to have annual echocardiograms if an echocardiogram was performed within 18 months of baseline and follow-up visits. Those who did not undergo annual screening were those for whom ≥1 screening was missed. We compared baseline diffusion capacity for carbon monoxide (DLCO), right ventricle systolic pressure (RVSP) and modified Rodnan skin scores (mRSS) between groups after controlling for gender, age at diagnosis, total number of visits, tobacco use and prevalence of peripheral vascular disease, diabetes mellitus and rheumatoid arthritis using regression analyses. Regression analyses also compared changes in each of DLCO, RVSP and mRSS between groups after controlling for covariates.

Results: Of 1223 individuals who had ≥3 visits, 360 (29.4%) underwent annual echocardiograms for the duration of their registry follow-up. Of these, 83.1% were female while 88.7% of those who did not have annual echocardiograms were female. At entry into CSRG, DLCO, RVSP, and mRSS were similar between those who did versus did not have annual echocardiograms after accounting for covariates. Over the course of follow-up, there was no significant difference in the absolute changes in DLCO, RVSP or mRSS between groups. Throughout the follow-up, 19.7% of those with annual echocardiograms had a right heart catheterization (RHC), of whom 35.2% had PAH on RHC. Of those who did not have annual echocardiograms, 17.6% had an RHC, of which 21.1% were found to have PAH.

Conclusion: Results suggest that changes in DLCO, RVSP and mRSS do not differ between those who do versus do not undergo annual echocardiograms. Similarly, there was no difference between the proportion of patients who received a diagnosis of PAH between groups. These results support previous CSRG data questioning the appropriateness of annual screening recommendations for all patients.

TOUR27

The New EULAR/ ACR 2019 SLE Classification Criteria: Defining Ominosity in SLE

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Toronto); Zahi Touma (Centre for Prognosis Studies, Division of Rheumatology, Toronto Western Hospital, University Health Network; Institute of Health Policy, Management and Evaluation, University of Toronto, Toronto); Jiandong Su (Toronto Western Hospital, Toronto); Sindhu Johnson (Toronto Scleroderma Program, Mount Sinai Hospital; Division of Rheumatology, Toronto Western Hospital; Department of Medicine, University of Toronto, Toronto)

Objectives: Determine the ominosity of the 2019 European League Against Rheumatism/American College of Rheumatology classification criteria (EULAR/ACR) by determining its predictive role for disease severity in the first 5-years following diagnosis.
Methods: 867 SLE patients from the Toronto Lupus Clinic were included (all recruited in the first year after diagnosis). For each patient, the EULAR/ACR score was calculated based on baseline information. To determine disease severity in the first 5-years after diagnosis, adjusted mean SLEDAI-2K (AMS), flares, remission and use of immunosuppressive treatment were used as outcomes. Based on receiver Operating Characteristic analysis a EULAR/ACR score of 20 was used as a threshold to compare demographic, clinical characteristics and outcomes between groups.
Results: A total of 867 inception patients were included, 87.5% were woman, with a mean age of 36.2 years at baseline. Most patients were Caucasians (66.7%), followed by Blacks (14.2%). The mean disease duration (time between diagnosis and first visit) was 0.2 years, the median time between the first visit and the second visit was 3.3 months. Blacks more frequently presented with a score ≥ 20 compared to Caucasians. At baseline patients with a score ≥ 20 were younger, had higher SLEDAI-2K scores and were more likely to receive immunosuppressive therapy. In the first 5 years of disease course patients with a score ≥20 had higher AMS scores ($p<0.001$) and were more likely to ever experience a flare ($p<0.001$). Every increase of 10 points in the score increased the AMS by 2.2 units (Univariate Linear regression, beta = 0.22, $p<.0001$) and the risk of a flare by 32% (RR: 1.32 95%CI: 1.173, 1.485, $p <.0001$). Also, individuals with a score ≥ 20 had lower probabilities of achieving remission, (including all 4 DORIS definitions of remission), of at least 15% compared to individuals with a low score, the Hazard ratios with significant p values confirmed this finding. The higher score group were also characterized by higher requirements for immunosuppressive therapy.
Conclusion: A EULAR/ACR score ≥20 is an indicator of ominosity in SLE. Patients with a score ≥20 were characterized by a more active disease course throughout the first 5 years. Thus, these new classification criteria could also provide prognostic information regarding disease severity in the first 5 years following diagnosis.

TOUR28

Assessment of the Impact of Interferon Levels on Cognitive Dysfunction in Patients with SLE

Andrew Kwan (University of Toronto, Toronto); Joan Wither (Division of Genetics and Development, Krembil Research Institute; Division of Rheumatology, University Health Network; Department of Immunology, University of Toronto, Toronto); Juan Martinez (Division of Rheumatology, Toronto Western Hospital, University Health Network; University of Toronto, Toronto); Robin Green (University Health Network, Toronto); Dorcas Beaton (University of Toronto/Institute for Work and Health, Toronto); Kathleen Bingham (University Health Network, Toronto); Mahta Kakvan (Toronto Western Hospital, Toronto); Lesley Ruttan (University Health Network, Toronto); Carmela Tartaglia (University Health Network, Toronto); Marvin Fritzler (University of Calgary, Calgary); May Choi (University of Calgary, Calgary);

Jiandong Su (Toronto Western Hospital, Toronto); Dennisse Bonilla (Toronto Western Research Institute, Toronto); Nicole Anderson (Toronto Western Hospital, Toronto); Patricia Katz (University of California San Francisco, San Francisco); Zahi Touma (Centre for Prognosis Studies, Division of Rheumatology, Toronto Western Hospital, University Health Network; Institute of Health Policy, Management and Evaluation, University of Toronto, Toronto)
Objectives: Cognitive impairment (CI) is among the earliest and most prevalent manifestations of SLE. Previous studies have demonstrated that increased levels of interferon (IFN)-induced gene expression in SLE are positively correlated with SLE disease activity and severity. The aim of this study is to examine the relationship between IFN levels and cognition as measured by the American College of Rheumatology neuropsychological battery (ACR-NB).
Methods: 301 consecutive consenting SLE patients (18–65 years old) attending a single center between Aug 2017 and Jan 2019 were enrolled in the study. IFN-induced gene expression was quantified by nano String on RNA isolated from whole peripheral blood archive in TEMPUS tubes. The log2 transformed normalized levels of five IFN-induced genes were summed to produce the IFN5 score. Cognition was measured using the ACR-NB (19 tests) representing manual dexterity, processing speed, language, simple attention, memory and executive function domains. Using age and gender stratified normative data, patients were classified on the ACR NB as having CI if a z-score of $\leq$-1.5 was observed in $\geq$ 2 domains or z $\leq$-2.0 in $\geq$1 domain. Principal Component Analysis (PCA) was used to explore the relationships among cognitive tests, interferon levels and SLE disease duration. IFN levels and SLE disease duration were used as supplementary variables.
Results: Of 301 patients, 89.0% were women, mean age 40.9±12.1 and mean disease duration 14±10.1 years at study entry. PCA cognitive tests loaded onto 2 dimensions explained 39.6% of the variance in neuropsychological performance. The 1st dimension (explained 28.3% of the total variance) was correlated mainly with more complex cognitive tests and primarily explained CI status of participants. The second dimension (11.3%) was mainly explained by measures of simple information processing or motor speed. The 1st dimension splits CI and non-CI patients, and no clustering was observed when participants were categorized based on interferon level. No relationship was found between the cognitive tests and IFN levels or disease duration. A weak negative correlation was observed between interferon levels and The Rey Complex Figure Task and hand tapping domains, though this was not significant.
Conclusion: This study assessed the relationship between IFN levels and cognitive function in patients with SLE. Using PCA analysis, we found no association between IFN levels and any cognitive tests, even after considering factors such as SLE disease duration. Best Abstract On Basic Science Research By A Trainee.

TOUR29

Medical Cannabis Use in Patients Attending Rheumatology Clinics in Ontario

Carter Thorne (Southlake Regional Health Centre, Newmarket); Edward Keystone (University of Toronto, Toronto); Patricia Ciaschini (Group Health Centre, Sault Ste. Marie); Vandana Ahluwalia (William Osler Health System, Ontario Rheumatology Association, Brampton); Arthur Lau (McMaster University, St. Joseph's Healthcare, Hamilton); Julie Brophy (Guelph Medical Place, Toronto); Viktoria Pavlova (McMaster University, Hamilton); Gerald Major (Toronto); Emmanouil Rampakakis (JSS Medical Research Inc, Montreal); Xiuying Li (University Health Network, Toronto); Angela Cesta (University Health Network, Toronto); Mohammad Movahedi (University Health Network, Toronto); Carol Mously (University Health Network, Toronto); Claire Bombardier (University of Toronto, Toronto)

Objectives: To determine the prevalence of medical cannabis use and the symptoms being treated in patients attending rheumatology clinics in Ontario.
Methods: Eight rheumatology clinics, currently participating in the Ontario Best Practices Research Initiative (OBRI), each recruited approximately 100 consecutive patients to complete a medical cannabis survey. Regardless of their diagnosis, patients were eligible to participate if they were 18 years of age or older and English speaking. The Student's t-test and Chi-square test were used to compare medical cannabis users (currently or within the past two years) to patients who reported never having used medical cannabis.
Results: A total of 858 surveys were completed. 179 (21%) patients reported ever medical cannabis use of whom 163 (19%; 95% CI: 16.5%-21.8%) were either currently using medical cannabis or had used it within the past two years. No significant differences were observed between medical cannabis users and non-users in mean (SD) age (56.7 (14.2) vs 59.5 (15.3)) and gender (% female) (72.8% vs 71.0%). The most common rheumatologist assigned diagnoses amongst users were osteoarthritis (40.5%) and rheumatoid arthritis (37.4%). Compared to the never used group, patients reporting medical cannabis use were more likely to be currently taking opioids (16.0% vs 7.2%, $p=0.0005$) and anti-depressants (25.8% vs 13.5%, $p=0.0001$), and have psychiatric (23.9% vs 10.9%, $p<0.0001$) and gastrointestinal disorders (30.7% vs 21.2%, $p=0.01$). Mean (SD) physician and patient global scores (0-10 VAS) were higher in medical cannabis users (2.9 (1.8) vs 2.1 (2.0), and 6.0 (2.6) vs 4.2 (3.0), $p<0.0001$) as were mean (SD) pain scores (0-10 VAS) (6.2 (2.5) vs 4.7 (3.0), $p<0.0001$). Amongst medical cannabis users, pain was the most common symptom being treated (73.0%), followed by anxiety (49%) and difficulty sleeping (49%). Overall, less than half the users (44.8%) reported medical cannabis to be effective or very effective in treating their symptoms. When asked whether changes had been made to their prescribed medications while using medical cannabis, 9.2% reported that they had their prescribed medications lowered and 6.1% that they had their prescribed medications stopped.
Conclusion: Based on our findings, it is not uncommon for patients being seen by rheumatologists to use medical cannabis and most are using it to reduce their pain symptoms. Less than half of the patients reporting medical cannabis use found it to be effective in relieving their symptoms and only 15% reported changes to their prescribed medications.

TOUR30

Does Statin Use have an Effect on Progression of Knee Osteoarthritis on Magnetic Resonance Imaging: The Vancouver Longitudinal Study of Early Knee Osteoarthritis (VALSEKO)

Jagdeep Gill (University of British Columbia, Faculty of Medicine, Vancouver); Eric Sayre (Arthritis Research Canada, Richmond); Ali Guermazi (Boston University School of Medicine, Boston); Savvas Nicolaou (University of British Columbia , Vancouver); Jolanda Cibere (Arthritis Research Canada, University of British Columbia Faculty of Medicine, Richmond)
Objectives: Recent in vitro and epidemiologic research has suggested a potential beneficial effect of statins on knee osteoarthritis (OA). The aim of this study was to evaluate the effect of statin use on progression of cartilage damage, joint effusion, osteophytes and bone marrow lesions (BML) on magnetic resonance imaging (MRI) in a population-based cohort with predominantly pre-radiographic knee OA.
Methods: Subjects were recruited at random from the population and assessed at baseline and 7-year follow up. Inclusion criteria: 1) age 40-79 years; 2) pain/discomfort in/around the knee on most days of the month at any time in the past; 3) any pain/discomfort in/around the knee in the

past 12 months. Exclusions were inflammatory arthritis, recent knee surgery or injury, inability to undergo MRI. Current statin use was ascertained at baseline. Subjects completed the Western Ontario and McMaster Universities (WOMAC) Osteoarthritis Index version VA 3.1 (scale 0-100). Radiographs were graded using the Kellgren Lawrence (KL) 0-4 scale. MRIs were read for cartilage (0-4; 0/1 were collapsed), osteophytes (0-3), BML (0-3), and effusion (0-3). Each outcome was defined as an increase ≥1 in any of the compartments graded. The primary outcome was cartilage progression. Logistic regression was used to assess the association between baseline statin use and progression of MRI outcomes after 7 years. Analyses were adjusted for age, sex, and BMI. To obtain population-based estimates, analyses were performed using age decade-gender stratum sampling weights.

Results: Of 122 subjects, 7.7% were statin users, 55.7% were female, mean age was 55.5, mean BMI 26.1, mean WOMAC pain 19.1. KL grades 0 to 4 was seen in 40.8%, 19.7%, 22.5%, 11.3% and 5.8%, respectively. Statin users, compared to non-users, had reduced cartilage progression, although this was not statistically significant (OR 0.56; 95% CI 0.13, 2.36). Similarly, there was no statistically significant association of statin use with progression of osteophytes (OR 2.00; 95% CI 0.28, 14.05), BML (OR 0.94; 95% CI 0.22, 3.97), or effusion (OR 1.20; 95% CI 0.27, 5.31).

Conclusion: In this population-based longitudinal cohort of early knee OA, statin use did not have an effect on MRI progression of cartilage, BML, osteophytes or effusion over 7 years. Despite recent evidence that statins might be beneficial in OA, we were unable to confirm such beneficial effects in this cohort with early disease.