falls. Only pain interference remained significantly associated with falls in multivariable regression analysis (OR = 1.02; 95% CI 1.00 to 1.05; p = 0.03). The model explained 25% of the variance in falls. Pain intensity was not associated with falls (OR = 0.98; 95% CI 0.95 to 1.01; p > 0.05) in multivariable regression analysis. DISCUSSION/SIGNIFICANCE: The findings suggest that pain is associated with falls among PwMS. Interventions designed to reduce falls incidence among PwMS may consider the inclusion of pain management as an integral component of those programs.

493

Knowledge of Familial Hypercholesterolemia Among Cardiology Healthcare Providers

Isha Kalia[1], Lusha Liang[2], Ronald Shope[1], Muredach Reilly[3] and Lisa Schwartz[1]

[1]George Washington University; [2]Columbia University Irving Medical Center and [3]Columbia University Irving Medical Center

OBJECTIVES/GOALS: Familial Hypercholesterolemia (FH) is a common disorder that is vastly underdiagnosed and causes an increased risk for sudden cardiac death. Cardiology providers (CHCPs) are in an ideal position to care for patients with FH. This research aimed to assess the knowledge of CHCPs in the screening, diagnosis, and management of FH. METHODS/STUDY POPULATION: Adaptation of an existing knowledge tool guided survey development. FH knowledge domains included description of FH, prognosis, prevalence, inheritance, diagnostic criteria, and management options. CHCPs were asked to select their provider type (MD, PA, NP, RN) and years in clinical practice (less than 1-5 years, 6-10 years, 11-20 years, and greater than 20 years).Convenience and snowball sampling recruited CHCPs in the Division of Cardiology at Columbia University Irving Medical Center (CUIMC). Descriptive statistical analysis was performed on quantitative survey data using R. Frequency counts of provider type and years in clinical practice were calculated. Comparisons of scores between provider types and years in clinical practice were made using ANOVA. RESULTS/ANTICIPATED RESULTS: 70 surveys were analyzed (30.2% response rate). 50% of CHCPs identified as MDs, 24.2% as RNs, 12.9% as NPs, and 12.9% as PAs. With regards to clinical experience, 21.4% of CHCPs had 1-5 years, 25.7% had 6-10 years, 24.3% had 11-20 years, and 28.6% had greater than 20 years. The average overall score across all CHCPs was 55.4%, with the highest on the description knowledge domain (81.4% correct), followed by management (61.8%), diagnostic criteria (60.6%), inheritance (58.6%), prevalence (44.3%), and prognosis (25.2%). Physicians had the highest average score of 66.0%, followed by NPs (50.3%), PAs (49.7%), and RNs (39.3%). There was no significant difference in scores across experience levels, provider types, and knowledge domains based on experience levels. DISCUSSION/SIGNIFICANCE: CHCPs across all provider types and years of experience had limited FH knowledge. There exists an opportunity to improve CHCPs' knowledge of FH through education (didactic knowledge) or practice (experiential knowledge). Future interventions should aim to increase didactic and experiential knowledge of CHCPs through a variety of methods.

494

Expert group decision making for pharmacogenomic testing in Ontario

Samuel Neumark[1], Mary Schmitz[2], Ayeshah G. Mohiuddin[3], Daniel Gillespie[4], Zubin Austin[2], Richard Foty[2] and Joseph Ferenbok[2]

[1]Translational Research Program, Department of Laboratory Medicine and Pathobiology, University of Toronto; [2]University of Toronto; [3]The Centre for Addiction and Mental Health and [4]Ontario Health

OBJECTIVES/GOALS: There is a need to better understand how governments develop strategies to adopt, evaluate, and implement novel health technologies in a public healthcare system. The goal of this project is to understand this strategy development process for the translation of pharmacogenomic (PGx) testing in Ontario, Canada. METHODS/STUDY POPULATION: This observational case study of the Ontario Health PGx Working Group focused on developing recommendations for a PGx testing implementation strategy in the province. The group included 9 individuals affiliated with Ontario Health and 13 healthcare experts from multiple clinical fields. Ontario Health is the government agency that oversees provincial healthcare planning and service delivery. Guided by the Translational Thinking Framework and qualitative research methods, we observed the working group's activities for eight months. We collected meeting recordings, slideshow decks, emails, and group characteristics. We used descriptive statistics and a nine-step inductive approach to analyze the data to create process maps, a case report, and key decision summaries. RESULTS/ANTICIPATED RESULTS: There were 19 meetings conducted remotely with video-conferencing technology. Throughout the working group's activities, we identified 15 key decisions related to either administrative processes or PGx scientific content. We further stratified these two categories into four main themes relating to decisions about 1) membership involvement, 2) logistical management, 3) discussion and recommendation scope, and 4) information dissemination. These four decision themes represent tools by which Ontario Health guided the expert group activities and achieved their goal of generating a strategic roadmap for PGx testing implementation in Ontario. DISCUSSION/SIGNIFICANCE: The Ontario government makes decisions about how expert groups function by monitoring and controlling the group's activities to ensure efficiency, standardization, and practicality. Describing expert group decision-making increases transparency and highlights the critical role they play in the translational pathway of health technologies.

496

Urinary Exosomal MicroRNA as Early Markers of Diabetic Kidney Disease in African American Adults

Maurice B. Fluitt[1], Neal Mohit[2], Mykaiya Sumling[3], Baiyee-Ndang Agbor-Baiyee[2], Kanwal K. Gambhir[2], Gail Nunlee-Bland[4], Constance Mere[5] and Maurice B. Fluitt[2,6]

[1]Howard University; [2]Endocrinology and Metabolism, Department of Medicine, Howard University College of Medicine; [3]Department of Biology, Howard University; [4]Diabetes Treatment Center, Howard University Hospital; [5]Division of Nephrology, Department of Medicine, Howard University College of Medicine and

https://doi.org/10.1017/cts.2024.421

[6]Laboratory of Epigenetic and Metabolic Research, Department of Medicine, Howard University College of Medicine

OBJECTIVES/GOALS: This study aimed to characterize urinary exosomal miRNA content in African American adults with diabetic kidney disease. METHODS/STUDY POPULATION: Male and female participants between the ages of 18 and 65 were recruited from the Diabetes Treatment Center and the Nephrology Clinic at the Howard University Hospital. Exosomes were isolated from cleared urine of healthy controls (n=3), type 2 diabetics (n=3), and participants with chronic kidney disease (n=3). The purity and size of isolated microparticles was evaluated using NanoSight technology (30nm to 120nm size range) and western blot analysis for exosome-specific markers (TSG101 and CD81) RESULTS/ANTICIPATED RESULTS: Expression of 5 selected microRNAs, miR-4534, miR-320c, miR-451, miR-362-3p and miR-877-3p were evaluated by qRT-PCR. miR-4534 and miR-451 was increased between healthy controls and the type diabetic group. MiR-320c was increased in the CKD group, in comparison to healthy controls. Conversely, there was no difference in miR-877-5p between the three groups. DISCUSSION/SIGNIFICANCE: These findings will provide insight into the use of circulating miRNAs as early markers of DKD, ultimately creating more effective treatments and preventive measures.

498

Bruton's tyrosine kinase (BTK) inhibitors impede platelet aggregation but not adhesion to collagen.

Thomas Kartika, Lorena Buitrago, Jihong Li and Barry S. Coller
Rockefeller University

OBJECTIVES/GOALS: The research objectives of this project are to elucidate the effects of Bruton's tyrosine kinase inhibitors (BTKi) of varying target specificity on platelet function with regard to platelet aggregation, adhesion, spreading, and intracellular signaling as measured by kinase phosphorylation. METHODS/STUDY POPULATION: Blood from healthy volunteers was obtained and processed to obtain both washed platelets and platelet-rich plasma. The samples were then treated with one of the BTKi drugs or with vehicle (DMSO) at concentrations matching patient blood concentrations derived from clinical trials and pharmacokinetic studies. The incubated samples were then analyzed in an aggregometer using one of several agonists. Aggregation was stopped after five minutes with a perchloric acid-based lysis buffer. The samples were then analyzed by SDS-PAGE and immunoblotting to quantify BTK protein and BTK phosphorylation. Adhesion was assessed by incubating washed platelets treated with BTKi on microtiter wells coated with fibrinogen or collagen and quantifying adherent platelets by their endogenous acid phosphatase activity. RESULTS/ANTICIPATED RESULTS: We found that ibrutinib, zanubrutinib, and pirtobrutinib all completely inhibited collagen-induced platelet aggregation, whereas they did not inhibit aggregation induced by thrombin, ristocetin, arachidonic acid, or the PAR1 activator peptide SFLLRN (T6). Acalabrutinib inhibited collagen-induced platelet aggregation only at high concentrations (1-2 micromolar). At the lower concentration of 200 nanomolar, comparable to the concentration required for the other BTK inhibitors to completely inhibit platelet aggregation, acalabrutinib failed to inhibit aggregation but did inhibit auto-phosphorylation, indicating an impact on signaling. None of the BTKi drugs inhibited adhesion of platelets to collagen-coated surfaces. DISCUSSION/SIGNIFICANCE: Our data show the inhibitory effect of BTKi on collagen-induced platelet aggregation and signaling. However, it remains unclear whether the inhibition is due to an effect on BTK itself or other related kinases. Better insight into the mechanisms of platelet inhibition by BTKi may help guide the development of BTKi with a lower risk of hemorrhage.

499

Physiological and Metabolomic Effects of a Community-Based Cardiorenal Protective Diet Intervention in African Americans with Chronic Kidney Disease and Hypertension

Meera J. Patel, Xuan Wang, Baylor Scott and White Health Teodoro Bottiglieri, Baylor Scott & White Health Heather Kitzman
University of Texas Southwestern Medical Center

OBJECTIVES/GOALS: Chronic kidney disease (CKD) impacts 15% of US adults and African American (AA) persons are disproportionately affected with more than 3 times higher risk of kidney failure when compared to Caucasian persons. This study evaluated the physiological and metabolomic effects of increased fruits and vegetables (F&V) on cardio-renal risk factors. METHODS/STUDY POPULATION: This pilot trial used a prospective, 2-group, randomized study design to evaluate a F&V intervention (N=46), where participants received a prescribed amount of fresh, base-producing F&V compared to a wait-list control (WL) condition (N=45). All participants were African American adults (≥18 years), had self-reported hypertension, and had CKD (Stage 1-3) on screening spot-urine microalbumin test. Participants were measured at baseline and 6 weeks post-intervention. Clinical data (i.e., systolic and diastolic blood pressure, lipid panel, hemoglobin A1C, BMI [body mass index], and albumin to creatinine ratio) were collected. Targeted metabolomic quantitative analysis was performed followed by LC-MS/MS and FIA-MS/MS. Linear mixed models evaluated analyte expression and clinical data. RESULTS/ANTICIPATED RESULTS: AA participants (N=91) were aged 58 ± 10.2 years, 66% female, and 54% had incomes ≤$50,000. T-tests compared change scores (baseline to 6-weeks) between groups. The F&V group demonstrated a significant reduction in BMI of -4.7 ± 10.5 kg/m² compared to a 1.9 ± 8.3 kg/m² increase in the WL group, $p<.01$. Further, the F&V group demonstrated a reduction in total cholesterol of -15.4 ± 58.8 mg/dL compared to a 17.7 ± 68.8 mg/dL increase in the WL group, $p<.05$. Non-significant reductions in hemoglobin A1c were found in the F&V versus the WL group. Metabolomic analysis indicated significant variation with an increase of suggestive key biomarkers for worse CKD in the WL versus F&V groups at 6-weeks. DISCUSSION/SIGNIFICANCE: Consumption of only 2 cups of F&V via a community-based intervention reduced CVD risk factors in AA adults with CKD and HTN and resulted in molecular/biochemical changes which may improve long-term kidney health. Further investigation may lead to development of cost-effective dietary intervention models to improve CKD outcomes in AA persons.

https://doi.org/10.1017/cts.2024.421