including left atrial volume index ($R = -0.798$, $p < 0.001$), and the ratio of early transmitral pulse-wave Doppler flow velocity (E) to early mitral annulus tissue Doppler velocity E' (E/E') ($R = -0.608$, $p = 0.036$), suggesting a role of diastolic dysfunction in patients with NAFLD with exercise intolerance. DISCUSSION/SIGNIFICANCE OF IMPACT: Cardiac abnormalities drive cardiorespiratory fitness and exercise intolerance in patients with NAFLD. These findings are exaggerated in patients with NASH suggesting a link between disease severity in NAFLD, exercise intolerance and diastolic dysfunction.

2396

Utility of the Modified Barium Swallow Impairment Profile as an outcome measure in oculopharyngeal muscular dystrophy

Sarah Youssof and Carol Romero-Clark
Clinical and Translational Science Center, University of New Mexico, Albuquerque, NM, USA

OBJECTIVES/SPECIFIC AIMS: Oculopharyngeal muscular dystrophy (OPMD) is a rare, late-onset muscular dystrophy that causes severe swallowing impairment (dysphagia). Although promising therapies are in the pipeline, validated dysphagia outcome measures for use in OPMD trials have not been established. Videofluoroscopic swallow studies (VFSS) are considered the clinical gold standard for dysphagia assessment, yet the optimal objective measure of VFSS in OPMD is not known. Our aim was to investigate the utility of the Modified Barium Swallow Impairment Profile (MBSImP) as an objective measure of VFSS in OPMD patients. METHODS/STUDY POPULATION: This was a single-center, prospective, cross-sectional study. In total, 26 individuals with OPMD underwent VFSS and other measures of dysphagia including 50-mL water swallow time (ST). Validity was assessed by examining correlations with an OPMD Global Severity Score (GSS) and with dysphagia duration. RESULTS/ANTICIPATED RESULTS: The MBSImP demonstrated moderate correlations with GSS (Pearson $r = 0.52$, $p = 0.006$) and ST ($r = 0.39$, $p = 0.049$). The relationship between MBSImP and dysphagia duration appeared nonlinear, and levelled off with long dysphagia duration. In contrast, ST did not correlate significantly with GSS ($r = 0.27$, $p = 0.18$), nor with disease duration ($r = 0.05$, $p = 0.83$). DISCUSSION/SIGNIFICANCE OF IMPACT: Objective measurement of VFSS is a promising outcome measure in OPMD. With long disease duration, the MBSImP may not be sufficiently sensitive to detect disease progression. More sensitive measures for scoring dysphagia severity on VFSS should be explored for application to future s of OPMD.

2431

Characterization of immune cell differences with anti-thymocyte globulin (ATG) and granulocyte colony stimulating factor (GCSF) in both preclinical and clinical models of type 1 diabetes

Andrea Lin, Clayton Mathews, Michael Haller, Todd Brusko, Mark Atkinson and Ryan Flynn

OBJECTIVES/SPECIFIC AIMS: Understand the immunomodulatory effects of anti-thymocyte globulin (ATG) and granulocyte colony stimulating factor (G-CSF) on type 1 diabetes patients using samples and in the preclinical model, the nonobese diabetic mouse. METHODS/STUDY POPULATION: Flow cytometry analysis of phase 1 peripheral blood samples treatment of nonobese diabetic mouse with ATG and GCSF and flow cytometry analysis of immune organs (spleen, lymph nodes, blood, bone marrow). RESULTS/ANTICIPATED RESULTS: Changes in both innate and adaptive immune cell subsets including plasmacytoid dendritic cells, naive, memory, effector CD4+ and CD8+ T-cells, and CD4+ T-regulatory cells and CD8+ T-regulatory cells DISCUSSION/SIGNIFICANCE OF IMPACT: Understanding of immune cell targets for immunotherapy in new-onset type 1 diabetes patients.

2432

A close examination of anti-retroviral drug selection and management in the optima study

Yuan Huang[1], Sheldon T. Brown, Shuangge Ma and Tassos Kyriakides
[1]Yale School of Medicine, Guilford, CT, USA

OBJECTIVES/SPECIFIC AIMS: Effective HIV therapeutic options for persons with advanced HIV disease whose regimens have failed multiple times are limited. Current clinical practice utilizes regimens comprised of combinations of anti-retroviral (ARV) drugs. Despite the widespread use of ARV medications, optimization of initial treatment composition and subsequent management remains challenging. The goals of this study are (a) to better understand the ARV treatment structuring using prior clinical and patient information including virtual phenotype data and measures of viral load and CD4 cell count. We evaluated the potential impact of ARV strategies on AIDS-defining events and mortality; (b) to assess and understand differences of treatment composition and management when comparing standard ARV strategy (<5 ARVs) with an intensive ARV strategy (at least 5 ARVs). METHODS/STUDY POPULATION: OPTIMA was a tri-national (United States, Canada, and United Kingdom) randomized open label of alternative ARV treatment strategies for patients with advanced HIV disease (CD4 ≤ 300 cells/mm^3) and evidence of resistance to 3 classes of ARV medications. OPTIMA used a 2 × 2 factorial design where the 2 factors were an ARV-free period Versus not; and standard Versus intensive ARV regimen. In this study, we focus on participants enrolled in OPTIMA at US participating sites and utilize demographic and clinical data including baseline virtual phenotype, ARV-related data (initial assignments and changes with drugs and dosages), follow-up lab data, AIDS-defining events, and vital status. RESULTS/ANTICIPATED RESULTS: Among 278 US-OPTIMA participants, 146 were randomly assigned to the standard ARV strategy and the rest were assigned to the intensive ARV strategy. Although not the sole factor, baseline virtual phenotype was used in selecting ARV medications within each assigned strategy. Participants in the standard arm exhibited better agreement between virtual phenotype results and the individual drugs selected for their regimen compared with participants in the intensive arm. This agreement had an almost statistically significant impact on survival time. No significant difference was detected in the frequency of ARV changes between standard and intensive ARV groups. DISCUSSION/SIGNIFICANCE OF IMPACT: Even though per design, OPTIMA assigned participants to an ARV strategy using a binary factor (standard vs. intensive ARV) and assessed its effect on HIV-related disease at a coarse level, the trial's design and rich database allowed for a closer examination of the ARV drug initial selection and subsequent management. Our findings summarize the patterns and discuss the effects of ARV and their management, on AIDS-defining events and survival. Such findings could provide preliminary, yet important insight, in understanding ARV use practice and could inform the conduct of future HIV treatment trials. Since the trial's randomization was at the ARV strategy level and not the individual ARV drugs, findings cannot be described in terms of causal pathways for specific ARVs.

2438

Dose-dependent nature of cocaine infusions on cardiovascular hemodynamics

Salvatore Carbone, Benjamin Van Tassell, Antonio Abbate, Justin Canada, Leo F. Buckley III, Sade Johns, Dinesh Kadariya and F. Gerard Moeller
Virginia Commonwealth University, Richmond, VA, USA

OBJECTIVES/SPECIFIC AIMS: Cocaine use is a significant health problem in the United States and associated with increased risk of adverse cardiovascular outcomes. Our goal was to evaluate the effects of rapid cocaine infusions on cardiovascular hemodynamics among patients with cocaine abuse disorder. METHODS/STUDY POPULATION: Patients with a history of cocaine abuse but no overt cardiovascular disease received 4 consecutive intravenous infusions of cocaine (0, 10, 20, 40 mg) given in randomized, double-blinded order. The infusion procedure was repeated on 2 consecutive days (4 infusions each day). Following each dose, patients underwent continuous monitoring via fingertip plethysmography for 30 minutes, followed by an additional 30 minutes washout procedure. Patients were surveyed throughout this timeline to record symptoms of cocaine response. Finger tracings were then used to calculate arterial pressure curves and parameters of heart rate, blood pressure, cardiac output, stroke volume, and systemic vascular resistance according to device-specific algorithms. Mean values were calculated over the entire 30 minutes follow-up and peak values were defined as the maximum value sustained over any 60-second interval during the follow-up period. RESULTS/ANTICIPATED RESULTS: Seven patients were enrolled and received cocaine infusions of 2 consecutive days. Cocaine dose was positively associated with mean cardiac output ($R = 0.489$, $p < 0.001$), peak diastolic blood pressure ($R = 0.435$, $p = 0.001$), mean heart rate ($R = 0.401$, $p = 0.003$), peak systolic blood pressure ($R = 0.399$, $p = 0.003$), peak mean arterial pressure ($R = 0.362$, $p = 0.008$), mean systolic blood pressure ($R = 0.399$, $p = 0.003$), + dP/dt ($R = 0.346$, $p = 0.012$), and peak heart rate ($R = 0.334$, $p = 0.015$). Hemodynamic parameters were also predictive of patient-reported symptoms of cocaine response. DISCUSSION/SIGNIFICANCE OF IMPACT: These data confirm the known pharmacologic effect of cocaine to prevent reuptake of neurotransmitters and demonstrate the feasibility of conducting a noninvasive assessment of cardiovascular

https://doi.org/10.1017/cts.2017.138 Published online by Cambridge University Press

hemodynamics as a measure of responsiveness to cocaine infusions. This procedure also provides a benchmark to evaluate the potential impact of pharmacologic treatments on cocaine-induced hemodynamic changes and patient perceptions of cocaine response.

2491

Parental concerns about child participation in s reflect a need to move beyond traditional notions of trust and race

Jennifer Erves, Tilicia Mayo-Gamble and Consuelo Hopkins Wilkins
Vanderbilt University, Nashville, TN, USA

OBJECTIVES/SPECIFIC AIMS: The objective of this study was to identify factors influencing parental willingness of adolescent participation in clinical trials. METHODS/STUDY POPULATION: We applied community engaged research principles to conduct a theory-based, cross-sectional study of parental willingness. Parents (N=307) were given a survey from November 2014 to April 2015. Factors influencing parental willingness were identified using binary logistic regression. SPSS version 22.0 was used to perform analyses, and $p<0.05$ was considered statistically significant. RESULTS/ANTICIPATED RESULTS: The most impactful factor on willingness was Advantages of Adolescent Clinical Research ($p = .001$), followed by Disadvantages of Clinical Research ($p = .006$), Knowledge of Adolescent Clinical Trials ($p = 0.029$), and Perceived Health Status of Adolescent ($p = .036$). In further exploring the influence of Perceived Advantages and Perceived Disadvantages, "My child will do something to help others." ($p = .026$) and "My child is too young to participate in a clinical trial." was the only significant Perceived Disadvantage ($p = .001$) were significantly associated with parental willingness. DISCUSSION/SIGNIFICANCE OF IMPACT: Improving parental knowledge and understanding of adolescent clinical trials, the advantages and disadvantages of adolescent participation, and the health status requirements for child participation are important factors to address when influencing parental willingness to allow adolescents to participate in clinical trials. Recruitment strategies that incorporate this information could improve future adolescent participation in clinical trials, ultimately promoting adolescent health and disease prevention.

2544

Dietary polyunsaturated fatty acid consumption is associated with improved body composition in nonalcoholic steatohepatitis patients

Hayley Billingsley, Salvatore Carbone, Justin M. Canada, Leo Buckley, Dave L. Dixon, Dinesh Kadariya, Sofanit Dessie, Benjamin W. Van Tassell, Antonio Abbate and Mohammad Siddiqui
Virginia Commonwealth University, Richmond, VA, USA

OBJECTIVES/SPECIFIC AIMS: Nonalcoholic steatohepatitis (NASH) is a common cause of chronic liver disease in the United States characterized by fat accumulation, inflammation, and fibrosis. Higher amounts of fat-free mass (FFM) and lower amounts of fat mass (FM) have been associated with better outcomes in several chronic diseases, recently also in NASH. Body composition is highly influenced by diet. However, the role of diet on body composition in patients with NASH is largely unknown. We hypothesized that consumption of polyunsaturated fatty acids (PUFA), healthy fatty acids mainly found in fish, nuts, and some vegetable oils, is associated with improved body composition, specifically greater FFM and lower FM, in NASH patients. METHODS/STUDY POPULATION: In total, 13 patients with histologically confirmed NASH underwent body composition testing via bioelectrical impedance analysis to estimate FFM% (% of body weight), FM% (% of body weight), and FFM/FM ratio. PUFA and saturated fat consumption was determined by standardized 5-pass 24-hour dietary recall. Correlations were computed using the Spearman rank test. RESULTS/ANTICIPATED RESULTS: Median body mass index (BMI) was 35.7 kg/m^2 (32.8–42.7), median age of the sample was 50 years (46.3–57.3), and 73% were female. Median percent of calories from polyunsaturated fat was 6.8% (5.4–9.6). Percent of calories from PUFA was positively and significantly associated with greater FFM% ($R = 0.56$, $p = 0.049$), lower FM% ($R = -0.59$, $p = 0.035$), and greater FFM/FM ratio ($R = 0.58$, $p = 0.037$). Additionally, a higher PUFA to saturated fatty acids ratio was also significantly correlated with greater FFM% ($R = 0.58$, $p = 0.039$), lower FM% ($R = -0.64$, $p = 0.020$), and greater FFM/FM ratio ($R = 0.57$, $p = 0.043$). DISCUSSION/SIGNIFICANCE OF IMPACT: In patients with NASH, the consumption of PUFA is associated with higher FFM and lower FM, which suggests a protective role of these nutrients on body composition. A larger study on patients with NASH is warranted to confirm our findings on PUFA consumption and body composition, as well as to determine whether these effects will improve clinical outcomes.

COMMERCIALIZATION/ENTREPRENEURSHIP/ REGULATORY SCIENCE

2254

iobio: From academic project to commercial enterprise

Alistair N. Ward, Chase Miller and Gabor Marth
The University of Utah School of Medicine, Salt Lake City, UT, USA

OBJECTIVES/SPECIFIC AIMS: The iobio project enables anyone (eg, diagnosticians, MDs, genetic counselors, citizen scientists) to perform useful analysis of genomic data, without a need to rely on bioinformaticians. iobio uses a novel real-time analysis framework, coupled with powerful visualizations delivered in a standard web browser. The project successfully supports free academic/nonprofit users, but occasions exist where it is more applicable for the project to be delivered commercially. Frameshift Genomics is developing commercial applications and functionality, which will exist alongside and in coordination with the academic project. These products will be marketed to large institutions including genome institutes, hospitals, diagnostic labs etc., but also to individual users who do not have access to large compute resources, or bioinformatic analysts, and everything in between. METHODS/STUDY POPULATION: The commercial iobio project under Frameshift Genomics aims to develop applications and features that cannot be successfully supported by an academic model. For example, when analyses are scaled up to processing of extremely large data sets, a commercial product with access to compute resources makes more sense than an academic tool. Bam.iobio is an application that samples data from sequencing alignment files, taking seconds to generate and visualize statistics representative of the entire file. This app is offered for free academically. When analysis involves thousands of such files, however, the commercial application, multibam.iobio, is more suitable. Other examples, including support for licensed third-party software and permitting extensive computation via cloud platforms, can also only be reasonably be supported via commercial software. Finally, development of commercial applications is driving adoption of more rigorous testing platforms, delivering more robust products. A particular strength of the iobio platform is allowing non-bioinformaticians to understand their data, for example providing quality control functionality providing confidence in data sets and the conclusions drawn from them. Such analyses are critical to all users of genomic data, and the iobio platform is ideally suited to provide an intuitive, integrated framework for performing them. RESULTS/ANTICIPATED RESULTS: The iobio project has been readily adopted by many in the community and shows significant promise for democratizing genomic analysis. Work is ongoing, supported by NIH small business grants, to develop commercial applications that will be marketed to analysts and medical professionals from large genome institutes and universities, to individual project users and citizen scientists. DISCUSSION/SIGNIFICANCE OF IMPACT: There are currently a number of iobio tools available academically, and they have been embraced by many in the genomics community. In fact, a number of popular platforms (eg, Galaxy, the International Cancer Genome Consortium (ICGC) data portal, mygene2 at the University of Washington) have incorporated iobio tools into their own platforms. To date, the gene.iobio variant interrogation tool has been used in a number of diagnostic projects, aiding identification of putative causative variants, and the pre-release version of the commercial multibam.iobio tool has been critical in unearthing data quality problems in project level data.

2389

I-Corps at NCATS: Toward entrepreneurial training for clinical and translational investigators and lessons learned in team-based customer and stakeholder discovery

Molly Wasko, Elaine Morrato, Nicholas Kenyon, Suhrud Rajguru, Bruce Conway, Sara Love, Nate Hafer, Pamela Bhatti, Jonathan Fay and Seth Zonies

OBJECTIVES/SPECIFIC AIMS: The goal of this abstract/presentation is to share lessons learned from participation in the NIH SBIR I-Corps Train-The-Trainer Program, discuss our experiences offering programs at our local institutions, and communicate our plans to develop an I-Corps@NCATS program that can be disseminated across the CTSA network. We believe that an I-Corps@NCATS program will enhance the process of scientific translation by taking best practices from NSF I-Corps and adapting the program to meet the needs of biomedical scientists in academic medical centers. By integrating I-Corps@NCATS training, we hypothesize that the clinical and translational investigator base will be better prepared to identify new innovations and to accelerate

https://doi.org/10.1017/cts.2017.138 Published online by Cambridge University Press