can be trialed in people with CKD for the prevention and treatment of CKD-MBD.

548

Metformin normalizes impaired renal and cardiac function in a rat model of transient undernutrition

Branka Stanic[1], Aline M.A de Souza[1], Hong Ji[1], Kyle Korolowicz[2], Kathryn Sandberg[1] and Carolyn M. Ecelbarger[1]
[1]Department of Medicine, Georgetown University and [2]Preclinical Imaging Research Laboratory, Georgetown University

OBJECTIVES/GOALS: In the U.S., over 4 million people including children experience transient periods of undernutrition annually. Cardio-metabolic and renal diseases are more prevalent in this population. We are investigating therapeutic strategies to reverse the long-term risk of these diseases in a rat model of transient undernutrition followed by refeeding. METHODS/STUDY POPULATION: Thirty six female Fischer rats (3-months of age) were initially divided into 2 groups. Half were fed regular chow (CT) while the other half were severely food restricted (sFR) by 60% from 0-2 weeks (wks) followed by refeeding from 2-14 wks (sFR-Refed). These 2 groups were then subdivided and treated ± metformin (Met) from wk 7 to wk 12 (n=9/group). High precision ultrasound was conducted on live rats to assess heart and kidney function immediately after the sFR period ended (wk 2) and at the end of the study (wk 14). At the conclusion of the experiment, the rats were sacrificed and the histology of the kidney and heart tissues were analyzed in hematoxylin and eosin-stained sections. The protein to DNA ratio was also calculated in homogenates from these tissues. RESULTS/ANTICIPATED RESULTS: In sFR-Refed rats, cardiac output (CO), heart rate (HR) and renal artery blood flow (RBF) were decreased by 11 ± 1.5%#, 7.0 ± 6.0% and 22 ± 0.6%#, respectively, compared to control (CT) rats; #p<0.05. Mean glomerular diameter was reduced in the kidneys of sFR-refed rats compared to CT and this effect was attenuated by metformin treatment [(μm): CT, 406 ± 31; sFR-Refed, 383 ± 11, p<0.06; CT+Met, 393 ± 18; sFR-Refed+Met, 407 ± 18*]. Furthermore, the mean cardiomyocyte thickness was reduced in sFR-Refed rats compared to controls while metformin treatment prevented this effect [(μm): CT, 16.4 ± 3.6; sFR-Refed, 11.5 ± 2.3#; CT+Met, 16.4 ± 3.6; sFR-Refed+Met, 15.9 ± 3.2*]. #p<0.05 vs. CT, same treatment; *p<0.05 vs. Met, same diet; two-way ANOVA. DISCUSSION/SIGNIFICANCE: These findings have promising implications for metformin use to mitigate long-term impairments in heart and kidney structure and function in individuals who have experienced bouts of undernutrition earlier in life for either voluntarily (e.g., very low calorie dieting) or involuntary (e.g., very low food security) reasons.

549

A Nationwide Pilot Study Testing a Remotely-Delivered Prolonged Nightly Fasting Intervention in Stressed Midlife Adults Living with Obesity and Memory Decline

Dara L. James[1], Linda K. Larkey[1], Molly Maxfield[1], Edward Ofori[1], Nanako A. Hawley[2], Kate Alperin[1], Peyton Osha[1], Chung Jung Mun[1] and Dorothy D. Sears[1]
[1]Arizona State University and [2]University of South Alabama

OBJECTIVES/GOALS: Cognitive decline is associated with obesity, stress, poor sleep, and circadian rhythm misalignment, which are themselves functionally intertwined. Irregular food intake timing exacerbates these all. Prolonged nightly fasting (PNF) aligns food intake with innate circadian rhythms. METHODS/STUDY POPULATION: A nationwide, remotely-delivered, 2-arm randomized controlled trial was conducted to assess feasibility and 8-week outcomes of cognition, stress, sleep, eating behaviors, and general eating habits, after a PNF intervention (14-hr nightly fast, 6 nights/week, no calories after 8pm) compared to a health education control (HEC) condition. Eligible participants were living with obesity, stress (Perceived stress scale-4 (PSS-4) total score ≥5), and memory "not as good as it used to be." Data were collected via Zoom meetings with participants and trained staff and entered into REDCap. All participants had weekly staff check-in calls to report fasting times (PNF group only) and feedback. RESULTS/ANTICIPATED RESULTS: Eligible participants were enrolled from 37 of 50 US states; N=58, 86% women, 71% white, 93% non-Latinx, mean (SD) 50.1 (5.1) years of age, BMI 35.6 (3.6) kg/m^2. No group differences existed at baseline. Linear mixed-effects models were used to compare group differences across all outcome changes. Compared to the HEC condition, the PNF intervention was associated with improved sleep quality (Pittsburgh Sleep Quality Index; B = -2.52; SE = 0.90; 95% CI-4.30 to -0.74; p=0.006). Stress, everyday cognition, and emotional eating behavior significantly changed over time (p<0.02), but there were no group differences. Analysis of feasibility outcomes are on-going. DISCUSSION/SIGNIFICANCE: Changing food intake timing 6 days per week, to exclude nighttime eating without mandating food quality/quantity change, may benefit many individuals living with obesity, stress and memory decline to improve their sleep. Improved sleep quality may lead to more health benefits over time.

552

Substance Abuse Research: Bench to Community (SARB2C) as a Model for Team Science

Tamara A Millay and Linda B Cottler
University of Florida

OBJECTIVES/GOALS: To present Substance Abuse Research: Bench to Community (SARB2C) as a model for team science both within and between institutions. Emerging from targeted efforts by the NIH to engage translational scientists in prominent public health issues, the initiative illustrates the benefits of bringing together researchers and trainees to share ideas. METHODS/STUDY POPULATION: In 2019 a group was formed at University of Florida to discuss ongoing translational research in the area of substance abuse, including faculty, staff, and trainees from across the campus. The group was expanded in February 2022 to include domestic colleagues at the University of Kentucky as well as international collaborators at Chulalongkorn University in Bangkok, Thailand. One-hour monthly meetings began in person but now take place virtually. Larger projects are discussed individually, focusing on opportunities for collaboration. Attendees also provide updates on their work, including proposals in development and manuscripts in process. This facilitates dialogue around the science, from the bench to the community, and connects people to advance team science. RESULTS/ANTICIPATED RESULTS: In light of the ongoing opioid epidemic and the public health threat of other emerging substances, collaboration among researchers in this area is essential to advance the science and explore real-world solutions. SARB2C demonstrates the benefit of connecting researchers across T0 to T4, and that of including trainees for invaluable experience. This environment fosters open discussion and creativity and helps break down the silos that impede science. A highlight from early in the

https://doi.org/10.1017/cts.2024.470

group's history was a visit from the Program Officer for the UF Clinical and Translational Science Institute in February 2020. Since that time, multiple collaborations have resulted in grants submitted, such as P30 center grants and an innovative R61/R33, as well as numerous publications. DISCUSSION/SIGNIFICANCE: A complex public health emergency like the opioid epidemic requires creativity and collaboration, from laboratory science to interventions in the community, putting it squarely within the sights of translational research. SARB2C will soon enter its fifth year of linking researchers and training the next generation of scientists.

553

Creating an In-Person Workshop Series Addressing Core Team Science Principles for Early Career Investigators

Lauren N. Whitehurst[1], Thomas H. Kelly[2], Victoria L. King[2] and Carol L. Elam[2]
[1]University of Kentucky and [2]University of Kentucky Center for Clinical and Translational Science

OBJECTIVES/GOALS: A barrier to the proliferation of team science is that academicians are often trained in disciplinary silos where "independent" research contributions are lauded. To tackle some of the most pressing scientific challenges, dismantling silos and increasing team science training efforts that focus on early career investigators is a must. METHODS/STUDY POPULATION: A team science training workshop for early career investigators from varied disciplinary backgrounds was informed by a 20-item needs assessment that addressed essential team science competencies and was completed by early career investigators participating in federally funded professional development programs on our campus. During the workshop, the benefits of cross-disciplinary teaming was discussed. Strategies including team formation, team effectiveness and/or dysfunction, diagnosing team strengths and weaknesses, and teaming in community settings were discussed. Instructional methods included short presentations, video clips, case studies, group discussions, pair and share activities, and panel discussions with expert role models encouraged active learning. RESULTS/ANTICIPATED RESULTS: The impact and value of the workshop series to participant's professional development and knowledge of team science concepts will be evaluated before and after the workshop. Multiple Likert-scale items focused on team science competencies (e.g., confidence in your ability to carry out responsibilities specific to your role on a team, recognize when the team is not functioning well; engage team science practices in on-going research), and open-ended questions (e.g., importance of engaging community partners in academic research teams, vision of what factors contribute to an effective team science collaboration) will be completed by program participants before and after completing the workshop. DISCUSSION/SIGNIFICANCE: Effective collaboration among scientists with expertise in different disciplines is needed to address and solve complex scientific problems. We believe our interactive approach to team competency training sessions would work in a variety of settings and improve team skills.

555

Design Lab Methodology Supports Innovation in Clinical Trials

Marisha E Palm, Paul Beninger, Denise Daudelin, Noe Duenas, Gigi Hirsch, Kris Markman, Ellaina Reed, Ludovic Trinquart, Mark Trusheim, Lisa Welch and Harry Selker
Tufts University

OBJECTIVES/GOALS: Since 2017, we have used the Design Lab methodology to support investigators taking innovative approaches to clinical effectiveness trial design. To date we have held 12 Design Labs and this year we are creating a handbook that will support dissemination of this approach across the Clinical and Translational Science Award consortium. METHODS/STUDY POPULATION: The Clinical Trial Design Lab brings together a multi-stakeholder group to consider innovative and impactful clinical trial designs. An investigative team is selected from a competitive pool of applicants, after which expert-led consultations support the investigator team to think about evidence generation in the context of the full treatment development pathway. Teams map the stakeholders at each step of this pathway (e.g. clinicians, patients, researchers, funders, industry experts, policy experts, regulatory experts, payers) and consider innovative design solutions. These consultations prepare investigators for an event that involves all stakeholders in a structured and facilitated discussion about trial designs that generate the best evidence and increase potential for health impact. RESULTS/ANTICIPATED RESULTS: The result of our work will be a set of Design Lab principles, a handbook with templates that support stakeholder mapping and structured discussions, and educational resources to accompany the handbook. The work is supported by a literature review that characterizes the multi-component processes included in the Design Lab, situates them within the larger context of team science interventions, and lays groundwork for the development of process metrics and impact evaluation criteria to assess the Design Lab method. In this poster presentation, we will share our multi-component broadly engaged team science approach, provide a brief outline of the principles and educational resources, and include an early version of the evaluation criteria. DISCUSSION/SIGNIFICANCE: Broadly engaged team science supports innovative thinking about study design and is especially important in the development of clinical trials. We have grown the Design Lab program of work over the past seven years and are now able to characterize our team science methodology and support others to use this approach to innovate for health impact.

556

Maternal Opioid Use Leads to Aberrant Maternal and Fetal Immunity

Heather True, Brianna Dorratt, Delphine Malherbe, Cynthia Cockerham, John O'Brien and Ilhem Messaoudi
University of Kentucky

OBJECTIVES/GOALS: Maternal opioid use disorder (OUD) is linked to poor fetal outcomes. While it has been established that

https://doi.org/10.1017/cts.2024.470