risk of CDI amongst hospitalized patients. Further prospective and molecular mechanistic studies are required to elucidate how cannabis impacts CDI.

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Association between HIV and early weight loss and the impact on subsequent treatment outcomes among patients with tuberculosis

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OBJECTIVES/SPECIFIC AIMS: Previous research suggests that weight loss during early TB treatment (first two months of anti-TB therapy) is a predictor of poor tuberculosis (TB) treatment outcomes among HIV-negative populations, but the relationship has not been well studied in the context of HIV. We examined the association between HIV and weight change during the first two months of anti-tuberculosis treatment, and also assessed the effects of HIV and early weight change on tuberculosis (TB) treatment outcomes. METHODS/STUDY POPULATION: Adults with culture-confirmed, drug-susceptible, pulmonary TB, regardless of HIV status, were enrolled into the Regional Prospective Observational Research for Tuberculosis (RePORT)-Brazil cohort and followed on standard anti-TB therapy. For the primary analysis, we compared weight change in persons living with HIV (PLWH) and HIV-negative patients between baseline and two months using multivariable bootstrapped quantile regression and modified Poisson regression. For secondary analysis, we examined the separate effects of HIV and weight change on poor TB treatment outcome (treatment failure, TB recurrence, or death) using Cox proportional hazards regression. RESULTS/ANTICIPATED RESULTS: Among 323 participants, 45 (14%) were HIV-positive. On average, PLWH lost 0.7% (interquartile range (IQR): −5.1%, 4.4%) of their baseline body weight between baseline and two months; those without HIV gained 3.5% (IQR: 0.8%, 6.7%). After adjusting for age, sex, and baseline BMI, PLWH lost 4.1% (95% confidence interval (CI): −6.5%, −1.6%) more weight during the first two months of anti-TB treatment than HIV-negative individuals. HIV infection was associated with weight loss ≥5% (adjusted odds ratio = 9.3; 95% CI: 4.2-20.6). Regarding the secondary analysis, 14 patients had a poor TB treatment outcome: 2 treatment failures, 4 cases of recurrent TB, and 8 deaths. PLWH and patients who lost ≥5% weight had significantly increased risk of poor TB treatment outcome with hazard ratios of 8.77 (95% CI: 2.96-25.94) and 4.09 (95% CI: 1.11-15.14), respectively. DISCUSSION/SIGNIFICANCE OF IMPACT: Our results suggest that HIV is associated with weight loss during early TB treatment, and both HIV and early weight loss were associated with poor treatment outcome. Future research should examine the potential etiologies of these findings and identify the types of interventions that would best promote weight gain during TB treatment, especially among PLWH, in order to prevent poor TB treatment outcomes.

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Association of Clopidogrel Resistance Determinants and MACE Ocurrence in Peripheral Arterial Disease

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OBJECTIVES/SPECIFIC AIMS: The study aims to identify the short and long-term associations of HTPR and presence of CYP2C19 polymorphism in the occurrence of major adverse cardiovascular events (MACE). The primary outcome of the study will be the presence of MACE including stent thrombosis, need for revascularization, acute limb ischemia events, myocardial infarction and death in relation to the presence of HTPR and CYP2C19 polymorphism. Secondary outcomes will include the prevalence of HTPR and CYP2C19 polymorphism in patients with PAD, and association with other medications including aspirin and cilostazol. METHODS/STUDY POPULATION: Patients above 21 years of age with the diagnosis of PAD using clopidogrel therapy for at least for seven days will be recruited at the University of Puerto Rico District Hospital and Cardiovascular Hospital of Puerto Rico and the Caribbean. RESULTS/ANTICIPATED RESULTS: A total of 200 patients from Puertorrican, Dominican and Cuban ethnicity will be expected to be recruited. The most common comorbidities will include, coronary artery disease, hypertension, dyslipidemia, and diabetes mellitus type 2. No significant distr DISCUSSION/SIGNIFICANCE OF IMPACT: The status quo as it pertains to resistance to clopidogrel in PAD patients is to improve antiplatelet resistance using antiplatelet therapy guided by platelet assays in order to reduce MACE occurrence. Although HTPR and presence of CYP2C19 polymorphisms have been studied on the PAD population, currently there is no gold standard test for measuring antiplatelet resistance. In that regard, this study will expect to identify the contribution that HTPR and CYP2C19 polymorphism might have on MACE in patients with PAD. In this way, the results will allow identification of abnormality parameters in HTPR and CYP2C19 testing in relation to the impact on risk of having MACE. Once the association of these variables with MACE is established, testing for clopidogrel resistance could become a potential strategy to optimize antiplatelet therapy and reduce the impact that MACE have in this population.

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Association of concurrent unhealthy alcohol use, tobacco use, and depressive symptoms on incident cardiovascular disease among HIV-infected and uninfected adults: Veterans Aging Cohort Study

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OBJECTIVES/SPECIFIC AIMS: This study applied a syndemic framework to 1) assess whether the concurrence of unhealthy alcohol use, smoking, and depressive symptoms is associated with increased risk for incident CVD among people living with and without HIV and 2) determine whether the association between this syndemic and incident CVD is differential by HIV status. METHODS/STUDY POPULATION: We evaluated 5731 participants (50.3% HIV+) without baseline CVD from the Veterans Aging Cohort Study, a prospective, observational cohort of PLWH and matched uninfected veterans enrolled in 2002 and followed through 2015. We assessed baseline number of conditions (syndemic score: 0-3; unhealthy alcohol use (>14 drinks per week for men [women] or 5 or

https://doi.org/10.1017/cts.2019.84 Published online by Cambridge University Press

more drinks in one occasion for men [women]), cigarette smoking (former/current), and depressive symptoms (Patient Health Questionnaire-9 score ≥ 10) and incident CVD through 14 years. Clinical ICD-9 codes identified incident cases of CVD (acute myocardial infarction, heart failure, revascularization, and stroke). We constructed age-adjusted survival curves and CVD rates. Multivariable Cox proportional hazards regressions estimated the hazard ratio (HR) and 95% confidence intervals (CI) of the syndemic score on incident CVD by HIV status, adjusting for baseline demographic, health status, and HIV-related factors. RESULTS/ANTICIPATED RESULTS: Under 10% of all veterans had zero conditions; 25.8% had one; 49.6% had two, and 14.3% had all three. Based on the prevalence of each individual condition in the cohort (unhealthy drinking: 41.5%, cigarette smoking: 75.0%, and depressive symptoms: 21.3%), the observed prevalence of all three conditions was more than double that expected by chance (6.6%). There were 835 cases of incident CVD (50.4% HIV+) during the median follow-up (10.6 years). Overall, age-adjusted incidence rates/1000 person-years increased with greater number of conditions (zero 10.1, one 12.5, two 15.8, three 19.6). Compared to uninfected people with zero conditions, the adjusted hazard ratios of incident CVD were similar by HIV status for each number of conditions. DISCUSSION/SIGNIFICANCE OF IMPACT: The syndemic of unhealthy drinking, cigarette smoking, and depressive symptoms is common and associated with high CVD risk. However, this risk was similar by HIV status. Our results underscore the need to screen for and treat these co-occurring conditions.

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Associations of aspirin, non-aspirin NSAIDs, statins, and metformin with risk of biliary cancer: A Swedish population-based cohort study

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OBJECTIVES/SPECIFIC AIMS: In an effort to elucidate the role of potentially cancer chemopreventive drugs, we leveraged the Mayo Clinic-Karolinska Institute collaboration to create a multidisciplinary team that included an epidemiologist, statisticians, and physicians. We performed a population-based cohort study to examine the association between low dose aspirin, non-aspirin NSAIDs, statins, metformin, other risk factors and the risk of biliary tract cancer (BTC), while assessing confounding by sex. METHODS/STUDY POPULATION: We conducted a nationwide Swedish population-based cohort study using the Swedish Prescribed Drug Registry, which virtually completely enumerates use of prescribed medications nationwide since 2005. BTC diagnosis (intrahepatic cholangiocarcinoma [iCCA], extrahepatic cholangiocarcinoma [eCCA] or gallbladder cancer [GBC]) was ascertained from the Swedish Cancer Registry. Age-scaled Cox models, with exposure as time-varying covariates, were used to calculate hazard ratios (HRs), separately for men and women. RESULTS/ANTICIPATED RESULTS: In the 5.7 million person cohort, the risk of iCCA was significantly lower in men using statins (HR 0.62,95%CI 0.39-1.00, p = 0.05), with a non-significant reduction in women. Statin use was associated with a significantly decreased risk of eCCA in both women (HR 0.60, 0.38-0.94, p = 0.03) and men (HR 0.47,0.28-0.80, p = 0.01). Low dose aspirin (HR 0.76,0.60-0.97, p = 0.03) was associated with a lower risk of GBC only in women, while statins (HR 0.72,0.55-0.93, p = 0.01) showed a significantly decreased risk of GBC in women and a non-significant reduction in men. For all BTC subtypes, combined use of low dose aspirin and statins did not confer additional risk reductions beyond those achieved by statins alone. Male and female users of non-aspirin NSAIDs appeared to be at increased risk of BTC and its subtypes. Metformin did not significantly affect risk of BTC. DISCUSSION/SIGNIFICANCE OF IMPACT: Our collaborative efforts allowed us to develop the largest population-based cohort evaluating risk and protective factors for BTC. Our results provide strong evidence in favor of the chemopreventive roles of low dose aspirin and statins in a subtype- and sex-specific manner. Individual risk factors contribute to development of BTC subtypes in different magnitudes. The next steps to translate these findings into clinical practice require randomized clinical trials that validate our results and provide a more complete picture of the risk-benefit ratio.

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Biomarkers of Stroke Recovery Study

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OBJECTIVES/SPECIFIC AIMS: There are currently no established blood-based biomarkers of recovery and neural repair following stroke in humans. Such biomarkers would be extremely valuable for aiding in stroke prognosis, timing rehabilitation therapies, and designing drugs to augment natural repair mechanisms. Metabolites, including lipids and amino acids, are engaged in many cellular processes and cross the blood-brain barrier more easily than proteins. Recent advances in liquid chromatography / mass spectrometry (LCMS) allow researchers to obtain a biochemical fingerprint of the metabolites in various biofluids. Thus, metabolite biomarkers of neural repair after brain injury are a promising avenue for future research. Objective: Design and conduct a study to identify metabolite changes in the blood associated with good and poor motor recovery following stroke. METHODS/STUDY POPULATION: We launched the Biomarkers of Stroke Recovery (BIOREC) study, which seeks to enroll 70 participants suffering arm motor impairment following stroke and 35 matched controls. BIOREC is a longitudinal observational study. Fasting blood samples are collected at 5, 15, and 30 days post-stroke, processed, and stored in the Georgetown Lombardi biorepository. Outcome measures, including measures of motor impairment, cognition and language, are assessed at 5, 15, 30, and 90 days post-stroke. The primary outcome measure is the upper extremity Fugl-Meyer score. Control participants are matched for age +/− 1 yr, race, gender, cardiovascular comorbities, and statin use through a computer algorithm that screens the entire MedStar electronic health record (EHR). Control participants provide 2 fasting blood samples one month apart. Once all samples are collected and sent for LCMS analysis, logistic regression analysis will identify potential metabolite biomarkers by comparing participants with good recovery to those with poor recovery as well as stroke participants to controls. RESULTS/ANTICIPATED RESULTS: To date, forty stroke participants have enrolled from 4 acute care hospitals in the Washington, DC metro region and completed all study procedures. Twenty stroke participants either dropped out or were withdrawn due to other medical concerns. Stroke patients ended up at a variety of venues following their acute hospitalization including the acute rehabilitation hospital, skilled nursing facilities, and home. We learned to overcome these logistical challenges by traveling to wherever the patients were sent

https://doi.org/10.1017/cts.2019.84 Published online by Cambridge University Press