was designed to include 40 US participants randomly assigned (3:1) to a TDF or placebo IVR. Twelve were randomized to TDF and five were assigned to the placebo group before the study was electively discontinued due to development of vaginal ulcerations in eight women in the TDF group. Acceptability data regarding TDF and placebo ring use was gathered via self-administered, computer-based questionnaires at the one- and three-month study visits. Participants were asked about overall attitudes and feelings regarding the TDF and placebo IVR, vaginal changes associated with ring use, and their experiences with ring use during menses and with sex. RESULTS/ANTICIPATED RESULTS: The mean age of participants was 30 years (range 18 - 42). Sixteen of 17 (94%) participants completed all study questions at both visits. When asked about ring likeability at one-month, 12 of 16 (75%) women reported overall liking the ring, including 5 of 8 (63%) who developed ulcerations. Vaginal changes described during ring use included 8 participants who indicated that the "vagina was wetter" and 2 who reported that the "vagina was drier." Additionally, 10 of 12 (83%) who had their period during the first month of the study were not bothered by ring use during menses, and 11 of 16 (69%) stated that the ring was not bothersome with use during sex. When asked at the three-month visit, most reported that they would prefer to wear the ring rather than use a condom during sex, however, condom use was low at baseline in this population. DISCUSSION/SIGNIFICANCE OF IMPACT: Despite unanticipated ulcers, the IVRs were acceptable, especially when used with menses and during sex. Regardless of the group assigned or vaginal changes experienced, and even amongst those who developed ulcerations, the women had positive attitudes towards the ring, which is promising for future use of vaginal rings as a method for HIV prevention.

4417

Association between Brain Volumes and Posttraumatic Stress Disorder in Intensive Care Unit Survivors

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OBJECTIVES/GOALS: To explore the severity of posttraumatic stress disorder (PTSD) symptoms in association with hippocampal and amygdala volumes in ICU survivors. We hypothesize that the severity of posttraumatic stress symptoms in ICU survivors is associated with lower volumes of both the hippocampus and amygdala. METHODS/STUDY POPULATION: Secondary analysis of the VISIONS study, a prospective sub-study of the BRAIN-ICU cohort, which included survivors of critical illness. Patients were screened for preexisting PTSD before discharge. The PTSD Checklist Specific (PCL-S) was used at 3 and 12 months to evaluate the ICU as a traumatic experience. A score of >30, indicated significant symptoms of PTSD. A Philips Achieva 3T MRI scanner was used to scan patients at both discharge and 3-month follow-up. To compare median brain volumes at discharge and 3 months for those with and without significant PTSD symptomatology (PCL-S ≥30) at 3 and 12 months, we used a Kruskal-Wallis (KW) equality-of-populations rank test. RESULTS/ANTICIPATED RESULTS: The median age for our sample was 58.5 (52.6, 63.7). One-third of the sample was female, and 90% were Caucasian. Fifty-seven percent of individuals (N = 12) had at least one prior mental health diagnosis, with two having a prior history of PTSD. One third of individuals experienced delirium during their critical illness. At 3-month follow up, there were three patients with PTSD symptomatology and one at 12-month follow up. Median brain volumes (hippocampus or amygdala) did not differ between individuals with or without PTSD symptomatology at either 3 or 12 months (p-values for all tests >0.05). DISCUSSION/SIGNIFICANCE OF IMPACT: Although our study did not reveal significant differences in brain volumes between PTSD patients and non-PTSD patients, sample size is a major limitation and larger scale studies should be undertaken to elucidate possible neurobiological markers of PTSD in ICU survivors. CONFLICT OF INTEREST DESCRIPTION: Dr. Wilson would like to acknowledge salary support from the Vanderbilt Faculty Research Scholars Program (1KL2TR002245), HL111111 and GM120484. Drs. Ely and Jackson as well as Mrs. Kiehl all receive funding for their time working on this investigation from AG035117 and HL111111. Dr. Ely would additionally like to acknowledge salary support from the Tennessee Valley Healthcare System Geriatric Research Education and Clinical Center (GRECC). Dr. Ely will also disclose additional funding for his time from AG027472 and having received honoraria from Orion and Hospira for CME activity; he does not hold stock or consultant relationships with those companies. The authors would like to acknowledge the following: this work was conducted in part using the resources of the Center for Computational Imaging at Vanderbilt University Institute of Imaging Science and the Advanced Computing Center for Research and Education at Vanderbilt University, Nashville, TN, and study data were collected and managed using REDCap electronic data capture tools hosted at Vanderbilt University.

4476

Association between socioeconomic status and comorbid conditions in a population of diabetes patients

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OBJECTIVES/GOALS: To reduce hospitalizations, health care systems are studying ways of improving social determinants of health (SDoH) in patients with chronic disease such as diabetes (DM). Our goal was to better characterize the SDoH of a cohort of DM patients by using socio-economic information from census data. METHODS/STUDY POPULATION: Our study population included DM patients seen in primary care practices of a large health care system in 2013-2017. We integrated socio-economic status (SES) information from the American Factfinder to data extracted from the electronic health record (EHR). Addresses for the cohort were geocoded using ArcMap to obtain the census tract information for median income, poverty status, educational level, and supplemental food benefits using American Community Survey 5-Year estimates. We used multivariable logistic regression to calculate odds ratio (OR) and 95% confidence intervals [], with 3+ comorbidities as the dependent variable and demographic and SES variables as independent variables. RESULTS/ANTICIPATED RESULTS: Our study population included 13,782 patients: 53% were female, 65% white, 28% Black, 27% were on Medicare, 3% on Medicaid, median age was 60, 53% had 3+ comorbidities. Median income was $66,243, poverty level 6%, receiving food benefits 8%, no high school degree 8%, and bachelor's degree or higher 30%. After evaluating collinearity, our multivariable analysis showed that patients with 3+ comorbidities were more likely to have income < $52,000 (lower quartile) versus $84,001 (upper quartile), OR = 1.2 [1.0-1.4]; be female, OR = 1.6 [1.4-1.7]; divorced or widowed versus married, OR = 1.5 [1.3-1.7], 1.4 [1.3-1.6]; and be on Medicare, Medicaid or

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both, OR = 2.4 [2.2-2.6], 2.2 [1.8-2.6], 6.0 [4.5-8.3]. DISCUSSION/SIGNIFICANCE OF IMPACT: Census tract-based SES could provide invaluable information to health care providers when associated to the EHR. We found that median income, which is not collected in the EHR, was significantly associated with a higher burden of disease. Census tract SES could serve as a proxy for evaluating SDoH.

4446

Association between treatment of asymptomatic Trichomonas vaginalis infection and preterm delivery*

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OBJECTIVES/GOALS: *Trichomonas vaginalis* (TV) has a prevalence of 26% in Baltimore and is associated with preterm delivery (PTD). Yet screening and treatment of TV is not advised due to conflicting data on harms. Our goal is to investigate the association between asymptomatic TV treatment and PTD. METHODS/STUDY POPULATION: This is a retrospective cohort study of women who delivered a child at The Johns Hopkins Hospital between 7/1/16 – 11/19/19. Exclusion criteria included multiple gestation, stillborn, miscarriage, diabetes, hypertension/ preeclampsia, HIV, and history of PTD. Chart review and ICD-10 diagnosis codes were used to collect data on demographics, STI test results, lab encounter diagnoses, STI treatment during pregnancy, and labor encounter diagnoses. Preliminary analysis for crude incidence of PTD in asymptomatic and symptomatic women treated for TV was performed using TriNetx, a global research network compiling all de-identified data within the Hopkins system. RESULTS/ANTICIPATED RESULTS: Three hundred and eighty women were tested for TV, 240 (63%) were asymptomatic and 140 (37%) women were symptomatic. Mean ages were 26 (SD:5) and 26 (SD:5) years, respectively. Black women comprised 87% of the asymptomatic cohort and 93% of the symptomatic cohort. Women of Hispanic ethnicity were represented by 4% of the asymptomatic cohort and 7% of the symptomatic cohort. Crude incidence of PTD was 4.1% among asymptomatic women and 7.1% among symptomatic women. Incidence ratio comparing asymptomatic PTD incidence to symptomatic PTD incidence was 0.58 with 95% CI (0.22, 1.56). DISCUSSION/SIGNIFICANCE OF IMPACT: Preliminary data from our study suggests there is no difference in PTD between asymptomatic and symptomatic women treated for TV. Future steps include multiple linear regression using a larger dataset. These preliminary data suggest TV should be considered for screening during pregnancy.

4234

Association of age at menopause with incident heart failure in the Southern Community Cohort Study

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OBJECTIVES/GOALS: Early age at menopause has been linked to increased risk of cardiovascular disease; however, there is limited evidence for a relationship between early menopause and heart failure (HF). We examined whether early menopause is associated with incident HF among women in the southeastern United States. METHODS/STUDY POPULATION: The Southern Community Cohort Study enrolled ~86,000 low-income black and white adults from 2002 to 2009. Participants for this analysis were 11,948 women who were postmenopausal at enrollment, had no history of HF, and were on Medicaid or Medicare. HF events were ascertained using ICD-9 codes 428.x via linkage of the cohort with CMS Research Identifiable Files through December 31, 2010. Early menopause was defined as self-reported age at menopause less than 45 years. Hazard ratios (HRs) and 95% confidence intervals (CIs) were computed from multivariable Cox regression models, overall and by race, adjusting for demographic, lifestyle, and reproductive factors, including reason for menopause. RESULTS/ANTICIPATED RESULTS: At baseline, mean age was 58±9 years, and 65% of participants were black. Among women with early menopause, 76% (n = 4,836) had menopause due to hysterectomy or oophorectomy. In women with later menopause, 74% (n = 4,102) reported natural menopause. During a median follow-up of 5.0 years (range 3.1-6.7), 2,157 incident HF events occurred. Compared with women with later onset of menopause, those with early menopause had increased HF risk (HR: 1.27, 95% CI: 1.10–1.47). Risk of HF associated with early menopause was similar in white and black women (p-value for interaction: 0.13). DISCUSSION/SIGNIFICANCE OF IMPACT: In this largely low-income population, early menopause was associated with an increased risk of developing HF. Women with early menopause represent a potential target population for future interventions to decrease risk of HF and cardiovascular risk factors.

4347

Bimodal Visual-Olfactory Training for Post-Surgical or Post-Traumatic Olfactory Dysfunction (VOLT Trial)*

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OBJECTIVES/GOALS: 1) Assess the patient-reported, perceived change in olfactory function after bimodal visual-olfactory training (OT) 2) Assess change in olfactory function after bimodal visual-olfactory training with a smell identification test 3) Assess which scents are most important to people with olfactory dysfunction (OD) METHODS/STUDY POPULATION: The participants are adults with subjective or clinically diagnosed OD with post-surgical or traumatic etiologies within the last 5 years. At the first of two study visits, participants complete the University of Pennsylvania Smell Identification Test (UPSIT) and complete general health (SF-36) and olfactory-related quality-of-life questionnaires. From a list of 34 scents, participants chose the 4 scents most important to them and smelled the scents twice daily for 3 months. Olfactory testing and the quality-of-life questionnaires were repeated at the final visit. RESULTS/ANTICIPATED RESULTS: 10 participants have enrolled in the study. There was one screen fail and one withdrawal. Six participants are currently undergoing OT and two have completed the study. Seven participants have post-surgical etiology and three have post-traumatic etiology of their OD. Of the two participants who have completed the study, one had an UPSIT score improvement from 25 to 33 out of the 40 questions correct. The minimally clinically important difference on the UPSIT is 4. She reports improvement subjectively. The second participant had a UPSIT score change from 25 to 24 and reports ability to smell is neither better nor worse. DISCUSSION/SIGNIFICANCE OF IMPACT: Traumatic and post-

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