of the study, study participants will be offered the opportunity to participate in 2-3 hour focus groups to discuss acceptability of the product as a treatment for premalignant HPV-related cervical disease until data saturation is achieved. Power and sample size calculations are based on the primary outcome of interest, which is clearance of HPV at 6 months. Basu et al (2013) documented HPV clearance in as many as 80% of subjects with topical curcumin. To account for an expected lower success rate in HIV-infected women, who will also be included in the study, we intend to power our study to determine a more conservative 20% improvement in clearance rate at 6 months with curcumin treatment, assuming an expected clearance rate of HPV in HIV-infected women of 25%. In order to detect a 20% difference of HPV clearance among those treated with intravaginal curcumin vs. placebo at 6 months, about 80 patients per arm would achieve 80% power at the 5% significance level. To account for up to 20% loss to follow-up or discontinuation, the total sample size in each arm would be 100 subjects with a total of approximately 200 subjects enrolled in both arms. RESULTS/ANTICIPATED RESULTS: We are currently in the process of collecting data for this study. We hypothesize that intravaginal curcumin will have a 20% higher rate of HPV clearance at 6 months as compared to placebo. Primary outcome measures will include clearance of HPV at 6 months in curcumin vs. placebo. Secondary outcomes measures will include recurrence of disease by either cytologic or histologic abnormality requiring further surveillance or treatment at 6 months. We also hypothesize that intravaginal curcumin administered once weekly at bedtime for 20 weeks will be safe, acceptable, and well tolerated. This is based off of previous findings from the Phase 1 trial of intravaginal curcumin that we performed. During this Phase 1 trial, we explored daily intravaginal administration of 2000 mg of curcumin to further understand curcumin's tolerability. Our focus group participants displayed an overwhelming consensus that daily administration affected quality of life, specifically due to the yellow-colored vaginal discharge from the medication. Study participants expressed that once or twice weekly administration was more tolerable and feasible. Our proposed study would therefore test the tolerability and effects of weekly curcumin administration and its ability to clear HPV infection. The primary outcome measure will be the proportion of study participants who discontinue treatment for any reason (acceptability) and the proportion of study participants who discontinue treatment due to adverse effects (tolerability). DISCUSSION/SIGNIFICANCE OF IMPACT: Non-surgical treatments that decrease the morbidity and risk of progression of premalignant HPV-related cervical disease are greatly needed, especially in low-resource settings and among women experiencing barriers to care and/or at high risk for disease progression. Medical treatment with the natural herb curcumin is an emerging strategy that may allow subjects to receive treatment of cervical lesions without undergoing a surgical procedure.Several preclinical and clinical studies have shown curcumin's ability to reduce tumors and precancerous lesions in animal and human cancer cells. Curcumin can suppress the activation of transcription factor NF-κB and the expression and activity of VEGF and p16INK4a, biomarkers known to be elevated in premalignant HPV-related cervical disease.Studies have also shown that curcumin alters HPV-associated molecular pathways in cancer cells, suppressing cervical cancer growth by inhibiting the transcription of oncoproteins HPV16 and HPV18 (designated as E6 and E7) and restoring p53 and retinoblastoma function. Our proposed study would therefore test the tolerability and effects of weekly curcumin administration and its ability to clear HPV infection. Our results will generate novel data as to what is an acceptable and well-tolerated dosing regimen of intravaginal curcumin, which would be crucial in designing further curcumin intervention studies. The results of our proposal will explore the effect of intravaginal curcumin as a standalone and adjuvant therapy to a LEEP among women with premalignant HPV-related cervical disease. The potential to not just excise diseased tissue, but to directly augment the clearance of the causative agent HPV, would have profound long-term ramifications in resource-limited settings and among women experiencing barriers to care and/or at high risk for disease progression.

4185

Assessing Barriers to Retention in Care Continuum Among HCV Positive Homeless Adults of New Orleans

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OBJECTIVES/GOALS: This study has two primary aims: 1) evaluate points of success and failure in connecting hepatitis C virus (HCV) positive homeless patients to care following a preliminary positive rapid HCV test result, and 2) describe the barriers cited by patients who drop out at each step in the care continuum. METHODS/STUDY POPULATION: A retrospective longitudinal analysis of adult (18 years or older) homeless individuals accessing shelter at six homeless shelters in New Orleans, LA was conducted. Every patient who came through a testing site received a survey collecting information on demographics, barriers to healthcare, and recent utilization of health services. A retrospective chart review of hospital and homeless clinic medical records was used to track patient linkage to care and their progress through the HCV care continuum. We defined successful linkage to care as attendance at the first scheduled follow-up appointment for treatment with a primary care physician. RESULTS/ANTICIPATED RESULTS: A total of 1719 unique patients were identified from August 2016 through August 2019 which included 36% self-identified as African American/Black, 55% identified as White and 8% identified as mixed-race or other. A total of 24% of individuals reported no insurance coverage while 66% of patients reported having insurance. Overall, 85 patients reported they experienced no barriers to healthcare. Of those who reported barriers, 44% reported trouble with finances or insurance, 22% transportation, 18% personal drug use, 9% personal alcohol use, and 7% reported a distrust of healthcare providers or the system. Other barriers included long wait times, distance, and recent incarceration. DISCUSSION/SIGNIFICANCE OF IMPACT: Although screening for HCV is readily available, barriers exist which prevent diagnosis and treatment. We implemented a HCV testing and linkage-to-care program between local homeless shelters and health centers in New Orleans in an effort to reduce HCV-related morbidity and mortality.

4102

Assessment of ivermectin-treated backyard chickens as a novel urban West Nile virus prevention strategy

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OBJECTIVES/GOALS: We conducted a randomized field trail to evaluate the efficacy and safety of a novel vector control strategy that

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involves treating urban backyard chickens with ivermectin (IVM), a widely used antiparasitic and mosquitocial drug. The goal was to reduce vector mosquito populations and West Nile virus (WNV) transmission. METHODS/STUDY POPULATION: We placed eight flocks—four treated and four untreated control—of six Lohmann brown chickens (16 month-old) each in backyard coops across Davis, CA and administered IVM in feed daily at treated coops (200 mg IVM/kg feed) for eleven weeks. We monitored entomological indices weekly (i.e. mosquito abundance, WNV infection prevalence, and parity rate) in *Culex* mosquito populations near (10 m) and far (150 m) from each coop location for the peak WNV transmission season (Jul-Sep 2019). We also monitored serum IVM levels in treated chickens and tested for WNV antibodies in all chickens throughout the study. RESULTS/ANTICIPATED RESULTS: Since IVM impacts only mosquitoes that live long enough to take a bloodmeal from a treated chicken, we do not expect to find a marked difference in adult *Culex* abundance between the two treatment arms, but we expect to find a reduction in WNV infection prevalence and a shift in female mosquito age structure towards younger, uninfected individuals at treated coops. We also anticipate seroconversions in treated chickens to occur at lower rates versus untreated control chickens indicating a reduction in WNV transmission intensity at treated coops. We observed no negative health outcomes from the long-term ingestion of IVM by study chickens. A pathological investigation is underway to compare histological findings between treated and untreated chickens. DISCUSSION/SIGNIFICANCE OF IMPACT: IVM provides the potential for targeted mosquito control. Reduced WNV transmission dynamics here is a stepping stone to a commercial WNV control strategy; IVM-treated feed for wild birds for homeowners' use to combat WNV transmission in their neighborhoods.

4256

Association Between Injury Intent and Emergency Department and Hospital Charges for Pediatric Firearm Injuries in the United States*

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OBJECTIVES/GOALS: In 2016, more than 3,100 children died, and an estimated 17,000 children had non-fatal injuries, from firearms in the United States. In this study, we used hospital charges as a proxy for medical resource utilization, and compared differences in charges by intent of firearm injury among children. METHODS/STUDY POPULATION: In this cross-sectional study of the 2016 Nationwide Emergency Department Sample, we identified firearm injury cases among children aged 19 years or younger using ICD-10-CM external cause of morbidity codes. Injury intent was characterized as unintentional, assault, self-inflicted, undetermined, or due to legal intervention. We included patients treated and released from the emergency department (ED) or admitted alive to the hospital, and excluded those who were transferred or died in the ED. We used linear regressions with survey weighting to compare differences in mean healthcare charges by firearm injury intent, with and without adjustment for ED disposition. RESULTS/ANTICIPATED RESULTS: Among 12,469 cases in the weighted sample, mean age was 16.5 years, a majority were male (88.2%) and Medicaid-insured (57.8%), and 64% were discharged from the ED and 36% admitted. Injuries were 49.0% unintentional, 45.1% assault-related, and 1.8% self-inflicted. Compared to children with self-inflicted injuries (charges $115,224), children with assault-related injuries (charges $55,052; $p<0.007$) and unintentional injuries (charges $38,643; $p<0.001$) had lower mean charges per visit. Differences in charges were no longer significant after adjusting for ED disposition, as 85.8% of self-inflicted injuries were admitted, compared to 46.5% of assault-related and 24.3% of unintentional injuries. DISCUSSION/SIGNIFICANCE OF IMPACT: Although the majority of pediatric firearm-related injuries resulting in emergency department care are unintentional or assault-related, self-inflicted injuries result in greater per visit hospital charges, attributable to higher hospitalization rates, and likely due to more severe injuries.

4164

Body mass index, not chemotherapy is the major predictor of insulin resistance in patients with hematological malignancies

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OBJECTIVES/GOALS: Cancer survivors are at increased risk for type 2 diabetes mellitus.It is not clear if diabetes susceptibility is due to shared risk factors for cancer and diabetes, such as obesity, or if it is directly related to cancer and its treatment. We investigated the association between malignancy and insulin resistance, a major risk factor for diabetes. METHODS/STUDY POPULATION: 20 adult patients with treated hematological malignancies and 21 controls without cancer were included in the study. Individuals with pre-existing diabetes were excluded. All patients underwent a 2-hour 75-gram oral glucose tolerance test (OGTT). Hyperinsulinemic-euglycemic clamps were performed to measure the steady-state glucose infusion rate (M-value) as an indicator of whole-body glucose utilization during insulin stimulation. Insulin sensitivity index was calculated by dividing M-value over the steady-state plasma insulin (M/I). RESULTS/ANTICIPATED RESULTS: Fasting or postprandial plasma glucose levels during the OGTT did not differ significantly between malignancy patients and controls (Table 2). Difference in the insulin-stimulated glucose utilization (M-value) was not statistically significant among cancer patients and controls (median, 7.2 [IQR, 6.2-10.4] vs. 7.3 [IQR, 5.5-8.9] mg/kg/min; $P = 0.261$). M/I index was significantly higher in malignancy patients compared to controls (median, 42.4 mg/kg/min/(μU/ml) [IQR, 33.9-67.2] vs. 23.4 mg/kg/min/(μU/ml) [IQR, 12.9-29.2], $P < 0.001$), however insulin clearance was also lower in the controls. In multivariate analysis, only BMI was significantly associated with M-value ($\beta = -0.2$ (95% CI −0.4, −0.1), $P = 0.004$), and M/I ($\beta = -2$ (95% CI −3.4, −0.5), $P = 0.009$). DISCUSSION/SIGNIFICANCE OF IMPACT: Our data suggest that the major contributor to diabetes development after diagnosis of cancer in adults is obesity-induced insulin resistance, not malignancy related factors. These findings emphasize the importance of obesity management in long-term survival of cancer patients, as diabetes is a risk factor for mortality in this patient population.

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