



RESEARCH
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(208) Variations in potassium channel genes are associated with persistent severe arm pain after breast cancer surgery

K Kober, D Langford, T Koettters, C West, J Levine, C Elboim, A Gary, D Hamolsky, L Dunn, H Rugo, M Dodd, S Paul, J Neuhaus, B Cooper, B Schmidt, A Dhruva, B Aouizerat, and C Miaskowski; University of California San Francisco, San Francisco, CA

Pain at the site of injury is a common symptom in women who undergo breast cancer surgery. Pain occurs in the axilla and arm ipsilateral to the affected breast. Recently, we used growth mixture modeling to identify latent classes (i.e., subgroups) of patients with distinct trajectories of worst arm pain scores using a 0-10 numeric rating scale (NRS), reported monthly for 6 months after surgery. Using GMM, patients were classified into "No" (41.6%), "Mild" (23.6%), and "Severe" (34.8%) pain groups. Given their role in nociceptive transmission and our previous finding of an association with breast pain, we hypothesized that variations in potassium (K+) channel genes would be associated with persistent arm pain after breast cancer surgery. Therefore, the purpose of this study was to test for associations between single nucleotide polymorphisms (SNPs) among 10 K+ channel genes and persistent breast pain after surgery. Differences in a number of demographic (i.e., age, ethnicity, income), clinical (i.e., body mass index, functional status, number of comorbidities), preoperative (i.e., number of breast biopsies, neoadjuvant chemotherapy, stage of disease, breast pain), intraoperative (i.e., number of lymph nodes removed, number of drains placed, type of surgery, axillary lymph node dissection, intercostobrachial nerve sacrificed), and postoperative (number of postoperative complications, severity of average and worst postoperative pain, placement of a surgical drain, received biological therapy or physical therapy during the 6 months) characteristics among the pain classes (all $p < .05$). Significant associations were found between variations in 5 genes [KCN2D ($n=6$, $p < .05$), KCNJ3 ($n=6$, all $p < .05$), KCNJ6 ($n=4$, all $p < .05$), KCNJ9 ($n=1$, $p = .005$) and KCNK5 ($n=9$, both $p < .05$)] and pain group membership. K+ channel gene variations and distinct demographic and clinical characteristics are associated with a novel phenotypic characterization of severe persistent arm pain after breast cancer surgery.

(209) Identification of distinct subgroups of patients with arm pain following breast cancer surgery

C Miaskowski, D Langford, T Koettters, C West, J Levine, C Elboim, A Gary, D Hamolsky, L Dunn, H Rugo, M Dodd, S Paul, J Neuhaus, B Cooper, B Schmidt, and B Aouizerat; University of California, San Francisco, CA

Pain at the site of injury is a common symptom in women who undergo breast cancer surgery. Pain often involves the axilla and arm ipsilateral to the affected breast. Persistent post-surgical pain in the arm is estimated to occur in 20% to 25% of patients following breast cancer surgery. However, detailed phenotypic characterization of persistent arm pain is lacking. The study purposes were to determine the prevalence of persistent pain in the arm; characterize distinct persistent pain classes using growth mixture modeling (GMM), and evaluate for differences among these pain classes in demographic, preoperative, intraoperative, and postoperative characteristics. In addition, differences in the severity of common symptoms and quality of life outcomes measured prior to surgery, were evaluated among the pain classes. Patients ($n=398$) were recruited prior to surgery and followed monthly for six months. Based on 0 to 10 ratings of worst pain, patients were classified into "No" (41.6%), "Mild" (23.6%), and "Severe" (34.8%) pain groups using GMM. Differences were identified in a number of demographic (i.e., age, ethnicity, body mass index, functional status, number of comorbidities), preoperative (i.e., number of breast biopsies, neoadjuvant chemotherapy, stage of disease, breast pain), intraoperative (i.e., number of lymph nodes removed, type of surgery, axillary lymph node dissection, intercostobrachial nerve sacrificed), and postoperative (number of postoperative complications, severity of average and worst postoperative pain, placement of a surgical drain, received biological therapy or physical therapy during the 6 months) characteristics among the pain classes (all $p < .05$). In addition, patients in the Severe Pain class reported higher preoperative levels of depression ($p < .05$), fatigue ($p < .001$), sleep disturbance ($p < .001$) and quality of life ($p < .001$) than the No Pain class. Findings suggest that approximately 35% of women experience significant and persistent levels of breast pain in the first six months following breast cancer surgery.

(210) Pain is associated with heavy drinking over time in HIV-infected Russian drinkers

J Tsui, D Cheng, S Coleman, E Blokhina, C Bridden, E Krupitsky, and J Samet; Boston University School of Medicine, Boston, MA

Alcohol use has been hypothesized to be a maladaptive coping response to pain. This study examines the association between pain and heavy alcohol use over time among HIV-infected drinkers using longitudinal data from the HERMITAGE study performed in St Petersburg, Russian Federation. Participants were HIV-infected adults with recent heavy drinking and unprotected sex. The main predictor was pain in the past month that at least moderately interfered with daily living, based on a single question from the SF-12. The primary outcome was past month heavy drinking (i.e., NIAAA risky drinking criteria). General estimating equations (GEE) logistic regression was used to calculate odds ratios and 95% confidence intervals for the association between pain interference and heavy alcohol use over time (i.e., baseline, 6- and 12-months), adjusting for other covariates. Pain, substance use, and depressive symptoms were modeled as time-dependent variables; all other covariates (age, marital status, gender, education, illicit drug use and randomization group) were based on baseline values. Participants ($n=699$) baseline characteristics were mean age of 30 ($SD \pm 5$) years, 41% female, and 22% < 9th grade education. Approximately one quarter of the sample had a CD4 cell count < 200 cells/ μ l, and only 17% were on antiretroviral therapy. Nearly half (46%) reported at least moderate pain interference in the past month. At baseline, 81% were drinking heavy amounts, which decreased to 41% and 40% at 6 and 12 months, respectively. In adjusted longitudinal GEE models, pain was significantly associated with greater odds of reporting past month heavy drinking (AOR=1.34, 95% CI: 1.05-1.71, p -value=0.02). We conclude that among a cohort of HIV-infected Russian drinkers, pain that at least moderately interfered with daily living was associated with higher odds of reporting heavy drinking over time. Pain may be an important risk factor for unhealthy alcohol use in the setting of HIV.

B05 Complex Regional Pain Syndrome

(211) Complex regional pain syndrome type II secondary to endovascular aneurysm repair: a case report

H Chen and R Takemoto; UCI Medical Center, Orange, CA

A 79-year-old male with an abdominal aortic aneurysm (AAA) status post endovascular aneurysm repair (EVAR) and left renal artery stent placement presented to our clinic with symptoms of atrophy and weakness of the left forearm and pain in the left hand. The EVAR procedure was performed two months prior. Upon examination, a pulsatile mass of 2-4cm was discovered in the left upper arm. Review of the operative report revealed that a catheter was introduced into the left brachial artery. An upper extremity ultrasound revealed a pseudoaneurysm of the left brachial artery. The patient was immediately taken for emergent repair of the pseudoaneurysm. After repair of the pseudoaneurysm, the patient's left upper extremity sequelae worsened. Four months after the repair, the patient demonstrated guarding of his left hand and allodynia to the median nerve distribution. The patient had skin changes, contracture of his digits with significant weakness and atrophy. X-rays of the hand demonstrated osteopenia. A diagnosis of stage 3 complex regional pain syndrome type II was made. EVAR of abdominal aortic aneurysms is a recent advance in vascular surgery that has allowed repair of an AAA while offering reduced intensive care unit and hospital lengths of stay, reduced blood loss, fewer major complications, and more rapid recovery. Common complications from the procedure include: endoleak, migration, and structural failure. This is, to our knowledge, one of the first reported cases of a complex regional pain syndrome induced by an EVAR procedure.