Gender Differences in Pain Experience and Treatment after Motor Vehicle Collisions: A Secondary Analysis of the CRASH Injury Study

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ABSTRACT

Purpose: Little is known about gender differences in the treatment of pain after motor vehicle collisions (MVCs) in an emergency department (ED). We aimed to describe gender differences in pain experiences and treatment, specifically the use of opioids and benzodiazepines after ED discharge, for MVC-related pain.

Methods: This was a secondary analysis of previously collected data from the CRASH Injury studies. We included patients who were seen and discharged from an ED after an MVC and who were enrolled in 1 of 2 multicenter longitudinal prospective cohort studies (1 black/non-Hispanic and 1 white/non-Hispanic). First, we compared the experience of pain as defined by self-reported moderate-to-severe axial pain, widespread pain, number of somatic symptoms, pain catastrophizing, and peritraumatic distress between women and men using bivariate analyses. We then determined whether there were gender differences in the receipt of prescription medications for post-MVC pain symptoms (opioids and benzodiazepines) using multivariate logistic regression adjusting for demographic characteristics, pain, and collision characteristics.

Findings: In total, 1878 patients were included: 61.4% were women. More women reported severe symptoms on the pain catastrophizing scale (36.8% vs 31.0%; $P = 0.032$) and peritraumatic distress following the MVC (59.7% vs 42.5%; $P < 0.001$), and women reported more somatic symptoms than men (median, 3.9; interquartile range, 3.7-4.0 vs median, 3.3; interquartile range, 3.1-3.5; $P < 0.001$). Unadjusted, similar proportions of women and men were given opioids (29.2% vs 29.7%; $P = 0.84$). After adjusting for covariates, women and men remained

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equally likely to receive a prescription for opioids (relative risk = 0.83; 95% confidence interval, 0.58–1.19). Women were less likely than men to receive a benzodiazepine at discharge from an ED (relative risk = 0.53; 95% confidence interval, 0.32–0.88).

Implications: In a large, multicenter study of ED patients treated for MVC, there were gender differences in the acute psychological response to MVC with women reporting more psychological and somatic symptoms. Women and men were equally likely to receive opioid prescriptions at discharge. Future research should investigate potential gender-specific interventions to reduce both posttraumatic distress and the risk of developing negative long-term outcomes like chronic pain. (*Clin Ther.* 2018;40:204–213)

Key words: gender, pain, opioids, gender differences.

INTRODUCTION

Injuries related to motor vehicle collisions (MVCs) account for more than 4 million emergency department (ED) visits every year.[1] Posttraumatic musculoskeletal pain resulting from MVCs has potential negative outcomes, including persistent pain (pain that lasts beyond the expected normal recovery time)[2] and even chronic widespread pain,[3] a condition associated with decreased physical independence as well as a lower quality of life.[4]

Based on literature supporting gender differences in a range of painful conditions such as headache, chronic pain syndromes, and musculoskeletal pain,[5] gender differences in posttraumatic pain may also exist.[6,7] Differences in pain between women and men across conditions are extensive and include differences in the severity and intensity of reported pain, pain sensitivity, prevalence of chronic pain, pain-associated distress and anxiety, and pain-induced hyperalgesia.[5,6,8–10] In addition, previous data have shown gender differences in both the receipt of analgesic treatment in an ED and in the response to treatment that is given (eg, opioids).[5,11–15] Potential gender differences in pain perception, experience, treatment, and outcomes after MVCs could have important implications on the development of chronic pain and related outcomes following a traumatic event.

Posttraumatic pain is often treated with opioids after ED discharge,[16] and musculoskeletal pain (including that resulting from trauma) treated in an ED or primary care setting is often treated with opioids and/or benzodiazepines.[17,18] Some data also suggest that there are increased rates of benzodiazepine use among patients in the months following an MVC.[19] Given the large number of opioids being prescribed in the United States[20] and the high prevalence of substance use disorders related to prescription opioids and benzodiazepines,[20] it is especially important to understand whether there are gender differences in the treatment response; outcomes of posttraumatic pain, including persistent or chronic pain; or in effects of opioid and/or benzodiazepine use among those treated for pain from MVCs. Although not specific to posttraumatic pain, data do show that prescriptions for benzodiazepines, which have the potential for abuse and long-term withdrawal, are approximately twice as common in women than men across all clinical indications.[21]

Before we can adequately explore gender differences in the long-term outcomes of posttraumatic pain and the response of posttraumatic pain to opioids and other classes of medications, we must first better characterize gender differences in acute posttraumatic pain and its treatment.

Objectives

We aimed to describe gender differences in pain and in the prescription of opioids and benzodiazepines following an MVC. First, we described gender differences in pain experiences among patients presenting to an ED with isolated musculoskeletal pain after an MVC. Next, we compared crude rates of opioid and benzodiazepine prescriptions after MVC between women and men. Finally, we evaluated whether patient gender was associated with differential prescribing, specifically receipt of an opioid or benzodiazepine at discharge, after adjusting for pain, demographic characteristics, and collision characteristics.

PATIENTS AND METHODS

Study Population and Setting

The CRASH project is a prospective, multicenter, observational cohort study funded by the National Institutes of Health to study predictors of acute and