Abstract

Background
Opioid medications affect not only the central nervous system but also immune function. Pro-inflammatory markers have been shown, although inconsistently, to increase with administration of opioids. However, few studies have been done in humans, and these have targeted non-generalizable populations (people addicted to opioids). Thus, we set out to measure the association between opioid use and inflammation, measured by C-reactive protein (CRP), in a cross-sectional analysis of a large, nationally-representative population.

Methods
Using data from 13,058 participants in the U.S. National Health and Nutrition Examination Survey (NHANES) from 2005 to 2010, we used multivariable logistic regression to estimate the association of elevated plasma CRP (> 0.18 mg/dl) with prescription opioid use, while controlling for a number of demographic and clinical factors.

Results
924 participants (6%) reported a using a prescription opioid. CRP levels were higher in opioid users than non-users with a statistically significant difference of 0.29 mg/dl (95% CI 0.21, 0.37; \( P < 0.001 \)). Opioid users had higher rates of poor physical health and comorbidities, and were more likely to be female, unemployed, obese, of low socioeconomic status, and to report recent tobacco or illicit drug use. In a multivariable model controlling for these and other potential confounders, high plasma CRP levels remained associated with opioid use with an odds ratio of 1.48 (95% CI 1.20, 1.81; \( P < 0.001 \)).

Conclusions
These results suggest, but cannot confirm, a pro-inflammatory effect of opioid use. Further investigations should aim to unravel the mechanisms by which opioids, in the context of various disease states, may influence inflammation.