

# Rates of Opioid Use and Dependence by Sociodemographics, Medical and Psychiatric Comorbidities, and Headache-Related Disability among Persons with Migraine in the US Population: Results of the American Migraine Prevalence and Prevention (AMPP) Study

Dawn C. Buse PhD<sup>1,2</sup>; Starr H. Pearlman PhD<sup>3</sup>; Daniel Serrano PhD<sup>4</sup>; Daisy S. Ng-Mak PhD<sup>5</sup>; Michael L. Reed PhD<sup>4</sup>; Richard B. Lipton MD<sup>1,2</sup>

1. Montefiore Medical Center, Bronx, NY; 2. Albert Einstein College of Medicine, Bronx, NY; 3. Armstrong Atlantic State University, Savannah, GA; 4. Vedanta Research, Chapel Hill, NC; 5. Merck Sharp & Dohme Corp., West Point, PA

## BACKGROUND

• Among acute migraine treatments, opioids may be the most controversial. They have the potential for dependence, may increase headache-related disability, and may negatively affect comorbidities.

## OBJECTIVES

1. Assess the prevalence of opioid use and dependence among persons with migraine in the US population.
2. Characterize sociodemographics, headache frequency, medical and psychiatric comorbidities, and headache-related disability by opioid use and dependence status.

## METHODS

- The AMPP is a longitudinal, population-based, mailed questionnaire study. Respondents were identified in 2004 by screening 120,000 US households to identify individuals with severe headache. A sample of 24,000 respondents were followed annually between 2005-2009.
- Respondents to the 2009 AMPP survey who met ICHD-2 criteria for migraine, had ≥1 headache in the preceding year, and provided the necessary data were categorized into 4 groups based on opioid use:
  - **Non-users:** denied use in all AMPP surveys between 2005-2009
  - **Previous users:** history of use reported in at least one AMPP survey between 2005 and 2008, but non-use in 2009
  - **Current users:** use of opioids in the 3 months preceding the 2009 AMPP survey
    - **Current opioid** users were divided into two groups according to *Diagnostic and Statistical Manual of Mental Disorders-4<sup>th</sup> edition (DSM-IV)* criteria for dependence:
      - **Current non-dependent**
      - **Current-dependent users**
  - Groups were contrasted by sociodemographics, headache characteristics, medical and psychiatric comorbidities including depression (measured by the PHQ-9), anxiety (measured by the PRIME-MD anxiety module), and cardiovascular events and risk factors (which included participant report of physician diagnosis of high cholesterol, hypertension, myocardial infarction, transient ischemic attack, stroke, angina, or having undergone coronary angioplasty, coronary stenting, coronary bypass surgery, or carotid artery stenting.)

## RESULTS

- In a sample of 5,796 persons meeting criteria for migraine, 4,076 (70.3%) were opioid non-users, 798 (13.8%) were previous users, and 922 (15.9%) were current opioid users.
- Among current users, 153 (16.6%) met criteria for dependence.
- All groups were primarily female.
- The average age in each group was in the low fifties, although compared to those non-users (mean age=50.7), previous (mean age=53.0), current non-dependent (mean age=53.6), and current-dependent users (mean age=53.1) were slightly older.
- Opioid use was associated with lower rates of current marriage and lower average annual household incomes. Annual household income was \$75,000 or greater in nearly 30% of non-users, 25.9% of previous users, 21.7% of current non-dependent users, and 15.0% of current-dependent users.
- Monthly headache day frequency was highest among current-dependent groups and increased across groups in a step-wise fashion: non-users: 3.2 days/month, previous users: 4.3 days/month, current non-dependent users: 5.6 days/month, and current-dependent users: 8.6 days/month.
- Rates of current full-time employment were lower in the previous (32.3%), current non-dependent (31.3%), and current-dependent (24.8%) groups compared with non-users (44.7%). (Fig. 1; difference significant at p<0.001).
- Headache-related disability was highest among current-dependent groups and increased across groups in a step-wise fashion. (Fig. 2; all differences significant at p<0.001).
- The prevalence of depression and anxiety were highest among current-dependent groups and increased across groups in a step-wise fashion (Fig. 3; all differences significant at p<0.001).
- Cardiovascular events and risks were most common among current users and increased across groups in a step-wise fashion (Fig. 3; all differences significant at p<0.001).

## CONCLUSIONS

- Opioids were reportedly used by 15.9% of the sample at the time of the survey, and had been used by 29.7% over the preceding 5 years. 16.6% of current users met DSM-IV criteria for dependence.
- Opioid use was associated with a number of adverse outcomes including dependence, more headache days per month, greater headache-related disability, lower rate of full-time employment, and higher rates of depression, anxiety, and cardiovascular comorbidities.
- Dependence was associated with worse outcomes on most variables.
- Since directionality can not be determined in this cross sectional study; longitudinal studies are needed to more fully understand the directionality and causality of effects between opioid use and the variables examined. Opioid use may be a marker for disease severity. The relationships between opioid use, disease severity, and outcomes needs to be explored in more detail. However, these data demonstrate that opioid use is associated with greater disease burden, and dependence is associated with the highest levels of headache-related disability, comorbidities, and other outcome measures.

Figure 1. Percent of Respondents Employed Full-Time

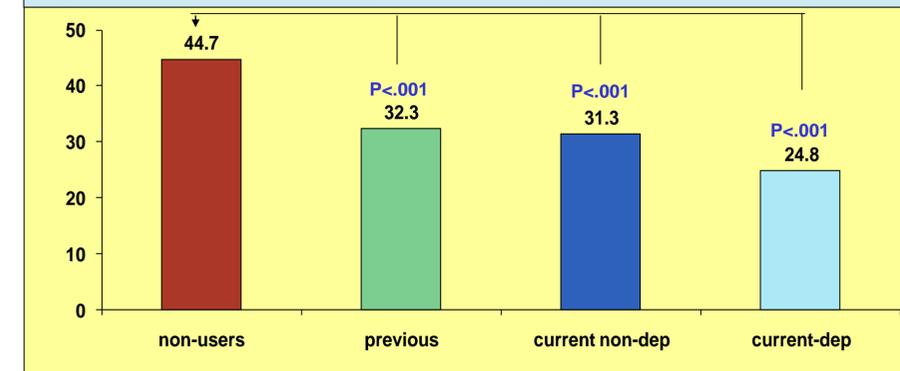


Figure 2. Headache-Related Disability

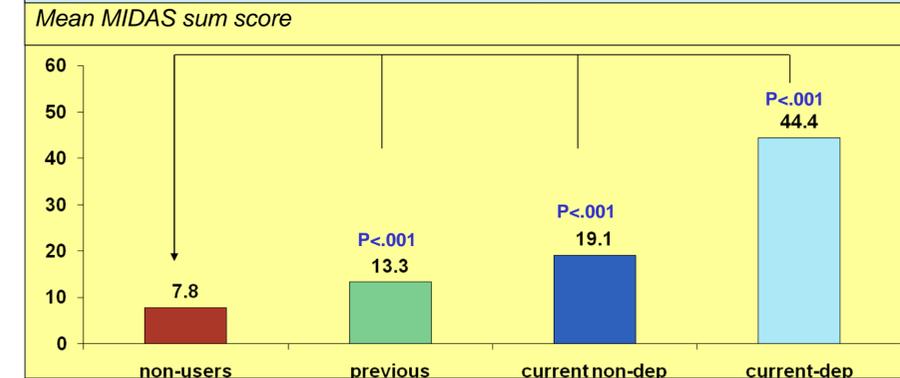


Figure 3. Depression, Anxiety & Cardiovascular Risks and Events

