Comparing abuse of extended-release versus immediate-release opioid analgesics adjusted for number of prescriptions and morphine-equivalent dose

Stephen F. Butler, PhDi, Theresa A. Cassidy, MPHi, Taryn Dailey, BA1, & Paul M. Coplan, ScDii, iii
1Inflexion, Inc., Newton MA 2Purdue Pharma, L.P., Stamford, CT 3University of Pennsylvania, Perelman School of Medicine

Background

Introduction & Objective

It has been suggested that abuse risk of extended-release (ER) opioids is greater than immediate-release (IR) opioids despite consistent findings that counts of abuse of some IR opioids are greater than ER opioids. Attempts to account for “exposure” (i.e., amount of active pharmaceutical ingredient (API) available to be potentially diverted for misuse/abuse) typically involve adjusting for numbers of prescriptions dispensed, leading to an assumption that IR opioids pose less of a public health risk than ER opioids. Average days of prescriptions for IR opioids are shorter than for ER opioids and average daily dose of IR opioid prescriptions is lower than for ER opioids. Thus on average, the amount of API available for abuse in IR opioid prescriptions is substantially lower than that for ER opioids. Rates of abuse adjusted for prescriptions without considering the amount of API dispensed could create a biased underestimation of the abuse risk of IR opioids. In order to understand the impact of various methods of accounting for exposure, we used substance abuse treatment center surveillance data from the National Addictions Vigilance Intervention and Prevention Program (NAVIPPRO®) ASI-MV data stream to compare four prevalence estimates for selected IR and ER opioids.

Methods

Sample

Self-report of abuse of selected IR and ER prescription opioids was estimated among individuals assessed for substance abuse problems from Q1 2011 through Q4 2013 using the NAVIPPRO® ASI-MV assessment.

ASI-MV Assessment

The ASI-MV is a standard computerized clinical interview for evaluation and triage in substance abuse treatment settings. The ASI-MV contains questions about past 30-day abuse of illegal substances and product-specific prescription medications. Specific medications are identified by images and audio of individual medications including medication names, slang names, and street names.

Estimation of Abuse Rates

Prevalence of abuse was modeled employing generalized estimating equations (GEE) for past 30-day abuse of selected opioids. Prescriptions were included in the model as an offset (denominator).

- Abuse of product per 10,000 prescriptions dispensed
- Abuse of product per 10,000,000 milligrams (mgs) dispensed
- Abuse of product per 10,000,000 morphine equivalent mgs dispensed

Sample Description

- 749 treatment centers in 41 states provided data across the time period studied.
- 179,235 unique individuals completed the ASI-MV assessment.
- The majority of respondents (50.6%) were between 21 and 34 years old; 35.6% were 35 to 54 years old; 8.5% were under 21 years old, and 5.3% were over 55 years old.
- Respondents were mostly male (64.4%).
- The majority of individuals assessed (58.9%) were White; 16.0% were Hispanic; 19.1% were African American, and 6.0% were other race or missing.
- The geographic region breakdown was 42.8% in the South, followed by the West (30.9%), the Midwest (21.5%), and the Northeast (4.7%).
- Among all ASI-MV respondents, 21.7% reported past 30-day abuse of at least one prescription opioid product.

Comparison of Relative Prevalence of Abuse of ER and IR Opioids Using Different Denominators

Figure 1. Prevalence of Past 30-Day Abuse of Selected IR and ER Prescription Opioids Adjusted for Prescription Volume

Figure 2. Prevalence of Past 30-Day Abuse of Selected IR and ER Prescription Opioids Adjusted for Number of Prescriptions

Figure 3. Prevalence of Past 30-Day Abuse of Selected IR and ER Prescription Opioids Adjusted for Milligrams Dispensed

Figure 4. Prevalence of Past 30-Day Abuse of Selected IR and ER Prescription Opioids Adjusted for Morphine Equivalent mgs

Conclusions

- How exposure is calculated impacts estimates of relative prevalence of abuse of IR and ER products.
- Widely prescribed IR opioids have high abuse rates (Figure 1) but their large prescription volume, in some cases, yields low per-prescription rates (Figure 2).
- Adjusting for mgs dispensed and morphine equivalence accounts for the longer duration/higher dose of ER opioids and shows greater relative rates of some IR opioids (Figures 3 & 4).
- All these “denominators” assume a proportional relationship between abuse and availability. Future studies will evaluate this assumption and examine the impact of models that may more closely reflect the actual relationship between availability and abuse.

Presented at the 70th Annual Meeting of the College on Problems of Drug Dependence, June 14-16, 2014, San Juan, Puerto Rico
Prepared with support from Inflexion, Inc.