CLINICAL RESEARCH STUDY

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A Tool to Assess Risk of De Novo Opioid Abuse or Dependence

Thomas Ciesielski, MD,[a] Reethi Iyengar, PhD, MBA, MHM,[b] Amit Bothra, MS,[b] Dave Tomala, MA,[b] Geoffrey Cislo, MD,[a] Brian F. Gage, MD, MSc[c]

[a]Division of Medical Education, Department of Internal Medicine, Washington University School of Medicine, St Louis, Mo; [b]Express Scripts, St Louis, Mo; [c]Division of General Medical Sciences, Department of Internal Medicine, Washington University School of Medicine, St Louis, Mo.

ABSTRACT

BACKGROUND: Determining risk factors for opioid abuse or dependence will help clinicians practice informed prescribing and may help mitigate opioid abuse or dependence. The purpose of this study is to identify variables predicting opioid abuse or dependence.

METHODS: A retrospective cohort study using de-identified integrated pharmacy and medical claims was performed between October 2009 and September 2013. Patients with at least 1 opioid prescription claim during the index period (index claim) were identified. We ascertained risk factors using data from 12 months before the index claim (pre-period) and captured abuse or dependency diagnosis using data from 12 months after the index claim (postperiod). We included continuously eligible (pre- and postperiod) commercially insured patients aged 18 years or older. We excluded patients with cancer, residence in a long-term care facility, or a previous diagnosis of opioid abuse or dependence (identified by International Classification of Diseases 9th revision code or buprenorphine/naloxone claim in the pre-period). The outcome was a diagnosis of opioid abuse (International Classification of Diseases 9th revision code 304.0x) or dependence (305.5).

RESULTS: The final sample consisted of 694,851 patients. Opioid abuse or dependence was observed in 2067 patients (0.3%). Several factors predicted opioid abuse or dependence: younger age (per decade [older] odds ratio [OR], 0.68); being a chronic opioid user (OR, 4.39); history of mental illness (OR, 3.45); nonopioid substance abuse (OR, 2.82); alcohol abuse (OR, 2.37); high morphine equivalent dose per day user (OR, 1.98); tobacco use (OR, 1.80); obtaining opioids from multiple prescribers (OR, 1.71); residing in the South (OR, 1.65), West (OR, 1.49), or Midwest (OR, 1.24); using multiple pharmacies (OR, 1.59); male gender (OR, 1.43); and increased 30-day adjusted opioid prescriptions (OR, 1.05).

CONCLUSIONS: Readily available demographic, clinical, behavioral, pharmacy, and geographic information can be used to predict the likelihood of opioid abuse or dependence.

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KEYWORDS: Demographic factors; Opioid abuse; Opioid dependence; Pharmacy claims-based factors; Predictive model; Prescription drug monitoring program

The United States has seen a dramatic increase in opioid prescriptions in the past decade with a concomitant increase in abuse of opioid medications.[1] There has been a tripling in the rate of opioid-related overdose deaths from 2000 to 2014, with more than 28,000 deaths in 2014.[2] This epidemic creates a dilemma for prescribers who seek to provide adequate pain

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Requests for reprints should be addressed to Thomas Ciesielski, MD, Division of Medical Education, Department of Internal Medicine, Washington University School of Medicine, 660 S. Euclide Ave, Campus Box 8121, St Louis, MO 63110.

E-mail address: t.ciesielski@wustl.edu

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relief while minimizing risks of abuse and dependence. Abuse is defined as the intentional self-administration of a medication for a nonmedical reason,[3] whereas dependence is a maladaptive pattern of substance use.[4,5]

Guidelines exist for using opioids in noncancer pain,[6] but prescribers face challenging situations when prescribing opioids and need tools to aid their decisions. Prescription drug monitoring programs can help reveal aberrant behavior. Forty-nine states have enacted these programs; however, monitoring alone does not prevent abuse.[7-10] Currently, there are limited tools that help predict which patients may develop opioid abuse or dependence. The Opioid Risk Tool identifies at-risk patients on the basis of medical, family, and social history.[11] However, the Opioid Risk Tool does not combine patient and prescription drug monitoring program information to assess risk. Clinicians need to know how risk factors ascertained at the time of prescribing opioids predict subsequent abuse or dependence.

CLINICAL SIGNIFICANCE

- Readily available variables can help quantify the risk of developing opioid abuse.
- Chronic opioid use and history of mental illness are the strongest predictors of abuse.

The objective of this study is to identify demographic characteristics, clinical and behavioral factors obtained from prescription drug monitoring programs, and pharmacy and geographic factors that quantify the risk of developing opioid abuse or dependence. These factors are immediately available to a prescriber by patient interview and by accessing a prescription drug monitoring program and could help assess the risk of prescribing opioids. Once at-risk patients are identified, additional screening tests could be used by the prescriber[12,13] and treatment of abuse and dependence could be pursued.

MATERIALS AND METHODS

We used de-identified (in accordance with Health Insurance Portability and Accountability Act requirements) pharmacy and medical claims data from a pharmacy benefit manager (Express Scripts) from October 1, 2009, to September 30, 2013. These data include health insurance claims (inpatient/outpatient medical and outpatient pharmacy) and enrollment data from large employers and health plans across the United States. This study included patients aged 18 years or older as of the index opioid claim date.

International Classification of Diseases, Ninth Revision (ICD−9) codes were used to identify medical diagnoses. First Data Bank "Smart Key" classifications were used to identify opioids on the basis of pharmacy claims.[14] Smart Key Specific Therapeutic Class designations (4-digit codes describing therapeutic drug classes) and Generic Code Numbers (5-digit numbers that group equivalent products based on active ingredients) were used to classify pharmacy claims (**Appendix 1**, available online). Dosage strengths for Specific Therapeutic Class were used in calculating daily morphine equivalent dosing and to classify immediate- vs extended-release opioids.

Exclusion criteria included patients with a cancer diagnosis (**Appendix 2**, available online), with claims for chemotherapy or antiemetics (**Appendix 3**, available online), in residence in long-term care facilities (residence code of 03 from the National Council of Prescription Drug Programs 384-4x classification), in convalescence after chemotherapy (ICD-9 V66.2), or in hospice/palliative/end-of-life care (ICD-9 V66.7). Patients with a prior opioid dependency diagnosis (within 365 days before the index claim) or who were taking buprenorphine/naloxone (typically used to treat opioid dependence) also were excluded (**Appendix 4**, available online).

To predict the likelihood of opioid abuse or dependency, we conducted a retrospective claims analysis. Derivation and validation models were developed. For the derivation model (Figure), we identified patients on the basis of 1 or

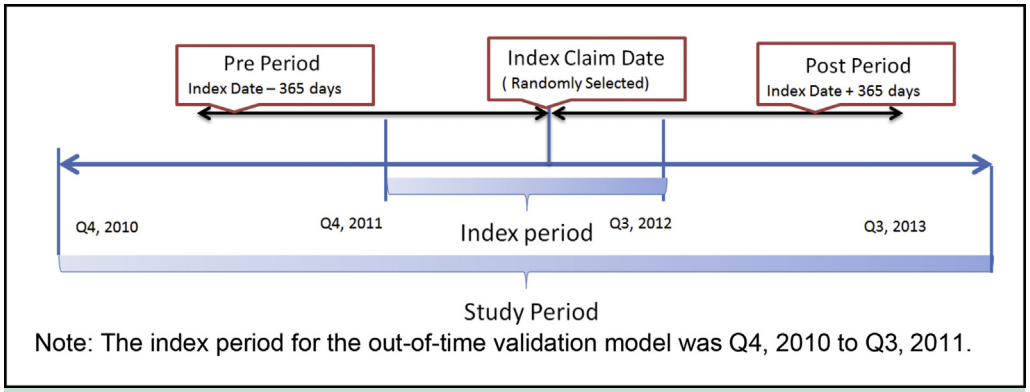

Figure Study timeline for the derivation model.