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Predictors of Improvements in Pain Intensity in a National Cohort of Older Veterans With Chronic Pain

Steven K. Dobscha,*,† Travis I. Lovejoy,*,† Benjamin J. Morasco,*,† Anne E. Kovas,* Dawn M. Peters,‡ Kyle Hart,* J. Lucas Williams,* and Bentson H. McFarland†,‡

**Center to Improve Veteran Involvement in Care, Veterans Affairs Portland Health Care System, Portland, Oregon. Departments of †Psychiatry, and ‡Public Health and Preventive Medicine, Oregon Health and Science University, Portland, Oregon.*

Abstract: **Little is known about the factors associated with pain-related outcomes in older adults. In this observational study, we sought to identify patient factors associated with improvements in pain intensity in a national cohort of older veterans with chronic pain. We included 12,924 veterans receiving treatment from the Veterans Health Administration with persistently elevated numeric rating scale scores in 2010 who had not been prescribed opioids in the previous 12 months. We examined: 1) percentage decrease over 12 months in average pain intensity scores relative to average baseline pain intensity score; and 2) time to sustained improvement in average pain intensity scores, defined as a 30% reduction in 3-month scores compared with baseline. Average relative improvement in pain intensity scores from baseline ranged from 25% to 29%; almost two-thirds met criteria for sustained improvement during the 12-month follow-up period. In models, higher baseline pain intensity and older age were associated with greater likelihood of improvement in pain intensity, whereas Veterans Affairs service-connected disability, mental health, and certain pain-related diagnoses were associated with lower likelihood of improvement. Opioid prescription initiation during follow-up was associated with lower likelihood of sustained improvement. The findings call for further characterization of heterogeneity in pain outcomes in older adults as well as further analysis of the relationship between prescription opioids and treatment outcomes.**

Perspective: ***This study identified factors associated with improvements in pain intensity in a national cohort of older veterans with chronic pain. We found that older veterans frequently show improvements in pain intensity over time, and that opioid prescriptions, mental health, and certain pain diagnoses are associated with lower likelihood of improvement.***

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Key words: *Chronic pain, veterans, Numeric Rating Scale, aged, analgesics, opioid.*

The prevalence of chronic pain is estimated to be 10 to 20% in the general population,[30,61] and chronic pain is especially common among veterans.[12,17,36,37] Key predictors of pain-related disability include baseline functional impairment, psychiatric comorbidities, poor general health, stress, coping patterns, and according to most reviews, older age.[11,26,31,42]

Unfortunately, although older adults are known to be at high risk for pain,[10,11,51] we know little about the natural history of chronic pain in older age. More specifically, little is known about the factors that are associated with positive and negative outcomes over time related to pain and its treatment in this age group.[49,52] Older adults are often excluded from clinical trials, and when they are included, results are often not analyzed or reported according to age.[52] Importantly, older adults also have the highest prevalence of long-term use of analgesics (including opioids).[10,51] Although some studies suggest positive associations among older age, short-term opioid use, and reductions in pain intensity,[7,49] a number of studies

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Address reprint requests to Steven K. Dobscha, MD, Veterans Affairs Portland Health Care System, PO Box 1034 (R&D 66), Portland, OR 97207. E-mail: steven.dobscha@va.gov

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have linked prescription opioid use with worse pain outcomes and other adverse events.[3,16,27,62]

Forty-four percent of veterans nationally are age 65 or older, and 21% are age 75 or older; these proportions are expected to increase over the next 5 years.[46,60] Thus, the aging veteran population is at especially high risk for pain-related problems. Over the past decade, as one component of a national pain strategy, the Veterans Health Administration (VHA) has collected pain intensity score information during routine care; veterans are administered the single-item, 11-point Numeric Rating Scale (NRS)[34] pain intensity measure during most outpatient VHA health care encounters. We recently reported that VHA pain intensity scores can be reliably extracted from the medical record and described over time.[21] The primary objective of the current study was to identify patient demographic and clinical factors associated with change in NRS scores over time in a national cohort of veterans aged 65 years or older who have indicators of chronic pain (ie, elevated pain intensity scores and pain-related diagnoses). A secondary objective was to identify factors associated with sustained improvement in NRS scores. On the basis of the literature available, we hypothesized that older age and comorbid mental health conditions would be associated with less improvement in pain over time.

Methods

The Institutional Review Board of the Portland Veterans Affairs (VA) Health Care System approved this study. The study was considered exempt from requiring written informed consent because it was a secondary analysis of existing data contained in VHA administrative data sets. Methods related to this project have previously been described.[21]

Sources of Data

Pain intensity scores are recorded as structured vital sign data in the VHA electronic health record. Through VHA's national Corporate Data Warehouse (CDW), these data can be linked with outpatient and inpatient utilization, pharmacy, diagnosis, and demographic data. The CDW combines electronic health record data for all VHA patients from 1999 to present into a relational database. The VHA Informatics and Computing Infrastructure facilitates secure access to CDW data for approved VHA researchers.

Sample

To identify a national cohort of older (age 65 years and older) veterans with indicators of chronic pain, we began by obtaining a retrospective sample from the population of 5.9 million VHA patients of any age with at least 1 VHA outpatient visit in 2010 (Fig 1). To be included in the study, patients had to have at least 3 average monthly pain intensity scores of ≥4 (called "qualifying scores") within a 12-month period beginning in 2010. Each patient's NRS scores were averaged using all scores within each month to produce average monthly pain intensity scores. Computing monthly averages reduces the

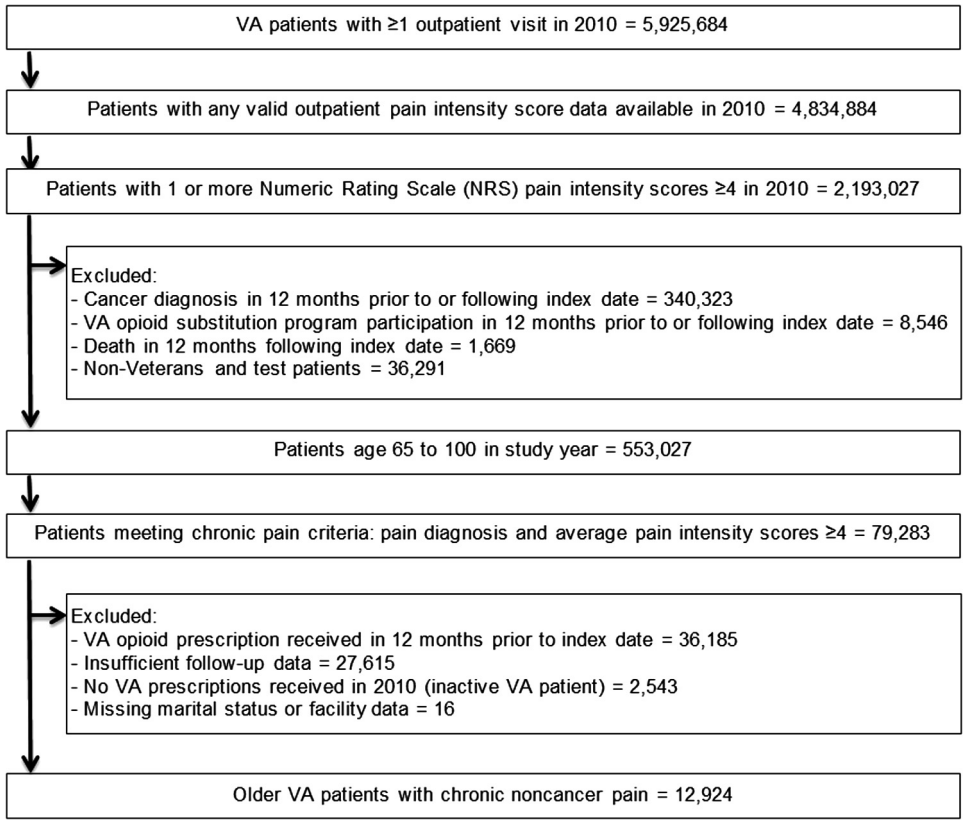

Figure 1. Development of the study cohort.