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Impact of Provider-Facing Interventions to Reduce Opioid Use on Pain Related Outcomes in Primary Care: A Cluster Randomized Trial

Introduction

Opioid analgesics can be prescribed to patients presenting with acute noncancer pain in primary care.[1,2] In a recent study,[3] we demonstrated that providers who received emails comparing their opioid prescribing patterns to other providers prescribed less opioids to patients presenting with acute noncancer pain at initial visits compared to providers following an electronic health record (EHR) guideline. In follow-up to this primary study, we examined patient reported pain, pain interference with function and activity, and treatment satisfaction across these different provider-facing interventions.

Methods

The parent study was a multisite, cluster-randomized clinical trial of opioid-naïve patients (≥18 years) presenting with acute musculoskeletal pain or non-migraine headache. Patients were recruited between September 2018 and January 2020 from 48 primary care clinics representing three healthcare systems. Patients were seen by 525 providers from one of four conditions: (a) control (providers received EHR guideline on opioid prescribing at time of initial visit), (b) opioid justification (control plus a request to enter free text justification for prescribing opioid); (c) provider comparison (control plus monthly e-mails regarding their opioid prescribing practices compared with peers); and (d) opioid justification and provider comparison combined.

In a sub-study, a pre-specified secondary outcome was a composite average mean score of reported pain and pain interference with function and activity over the past week as measured by the three-item pain, enjoyment of life, and general activity (PEG) scale.[4] Satisfaction with treatment was measured by a single-item Likert scale from 1 to 10, with 10 indicating highest satisfaction. The PEG was administered at the initial qualifying visit to establish a baseline[4] and online or by phone with the satisfaction scale at 1-, 6-, and 12-month follow-ups. We had 87–99.9% power at baseline mean PEG scores of 3.5, 5.0, and 6.5 to test for equivalence of PEG scores among comparator groups through 12 months of follow-up. We also collected demographic (age, gender, and race) and opioid prescription data at baseline.

To examine differences in patient outcomes by intervention condition, we conducted a repeated-measures ANOVA via SAS software version 9.4 at each follow-up. We reported average mean scores and standard deviations for PEG and satisfaction at each time point. Per IRB-approved protocol, patients provided verbal consent to participate in this study.

Results

Of 2237 patients with baseline PEG scores, 38 (1.7%) received an opioid prescription at initial qualifying visit and 1142 (51%) reported a PEG 4, indicating moderate to high severity. Of those with a baseline PEG, 605 (27%; mean age 46.5, 46% female, 91% White, 7.3% Hispanic) agreed to follow-up surveys. PEG scores decreased across all intervention groups at 1-, 6- and 12-month follow-ups compared to baseline (Table 1); no significant differences in PEG scores were observed across these groups (Figure 1). Overall, patient mean satisfaction ratings were high (>7.5) at 1-month follow-up and steadily improved at 12-month follow-up across all groups (Table 1). We observed no significant differences in patient satisfaction across groups.

Discussion

As this study evaluated an acute musculoskeletal pain cohort, pain outcomes were expected to improve in most patients. Indeed, opioid-naïve patients presenting with acute noncancer pain in primary care reported steady improvement in pain intensity and interference, and treatment satisfaction across 12-months of follow-up. *A key finding from this clinical trial is that pain improved at approximately the same degree whether or not patients were in an intervention condition that lowered initial opioid prescribing*. These findings add to the evidence supporting provider-facing interventions to reduce unsafe opioid prescribing and subsequent risk of misuse and chronic opioid therapy.[3,5,6]

Limitations of this study were low and disproportionate participation rates (ie, 99% of results were from one health system), population-based comparisons only, and lack of data on non-opioid pain treatments delivered.

Data Availability Statement included at the end of the article

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Table 1. PEG Scores and Satisfaction Ratings From Baseline to 12-Month Follow-Up, by Provider-Intervention Group.

	Overall	CG	OJ	PC	OJ + PC
Baseline					
No. of patients	2237	754	234	509	740
PEG score	3.8 ± 3.1	4.0 ± 3.3	3.9 ± 3.1	3.3 ± 2.9	3.8 ± 3.0
Baseline (consenting patients)					
No. of patients	605	205	64	141	195
PEG score	3.8 ± 3.1	4.0 ± 3.4	4.5 ± 2.7	3.2 ± 2.8	3.8 ± 3.0
1-Month follow-up					
No. of patients	563	190	63	126	184
PEG score	3.8 ± 2.8	4.3 ± 3.0	3.8 ± 2.7	3.3 ± 2.6	3.6 ± 2.6
Satisfied	7.8 ± 2.9	7.6 ± 3.0	8.1 ± 2.9	8.0 ± 2.8	7.6 ± 2.9
6-Month follow-up					
No. of patients	451	149	50	106	146
PEG score	2.6 ± 2.6	3.0 ± 2.8	2.7 ± 2.7	2.4 ± 2.5	2.2 ± 2.5
Satisfied	8.1 ± 2.7	7.7 ± 3.1	8.0 ± 2.7	8.3 ± 2.5	8.6 ± 2.3
12-Month follow-up					
No. of patients	424	135	50	102	137
PEG score	2.3 ± 2.5	3.0 ± 2.9	1.9 ± 2.2	1.9 ± 2.0	2.2 ± 2.5
Satisfied	8.5 ± 2.3	8.3 ± 2.6	8.7 ± 2.0	8.6 ± 2.1	8.6 ± 2.3

OJ, opioid justification; PC, provider comparison; PEG, Pain/Enjoyment/General 3-item instrument; CG, control group (guideline only). Data cells represent *N* or mean + standard deviation.

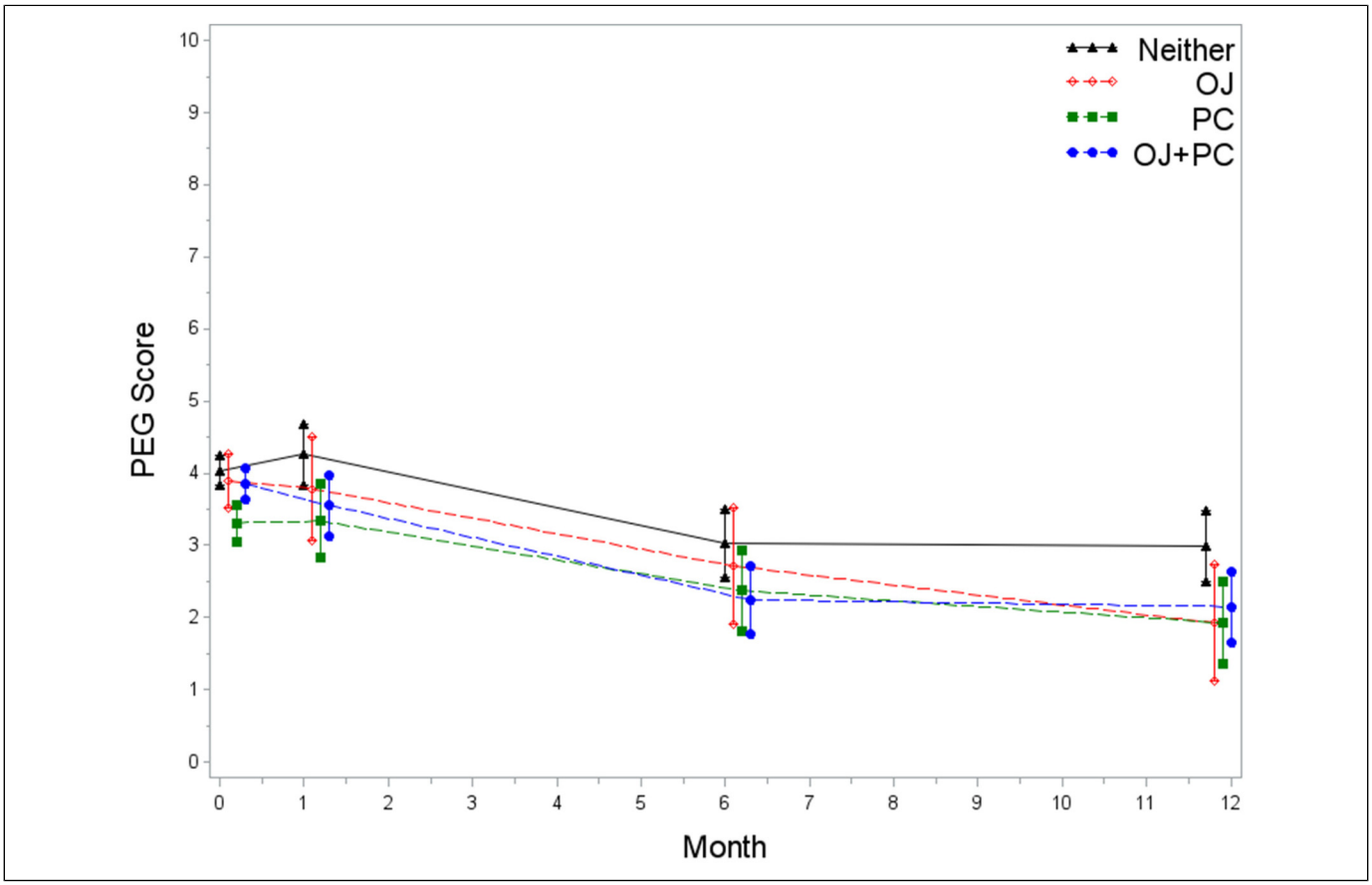

Figure 1. PEG scores at baseline and follow-up, by provider-intervention group.[a]
Abbreviations: OJ, opioid justification, PC, provider comparison.
[a]Repeated-measures ANOVA did not indicate any statistically differences among provider-intervention groups.

We conclude that provider-facing interventions that reduce opioid prescribing in primary care have no observed association with patient outcomes in reported pain and satisfaction with care.

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Dr Kraemer had full access to all study data and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Concept and design: All authors.

Acquisition, analysis, or interpretation of data: All authors.

Drafting of the manuscript: Hardy, Howey, Cochran.

Critical revision of the manuscript for important intellectual content: All authors.

Statistical analysis: Wasan, Kraemer.

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Administrative, technical, or material support: Cochran, Kraemer, Wright, Wasan.

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Key Collaborator Contributions

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Additional Contributions

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Declaration of Conflicting Interests

The authors declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: Dr. Gordon reported grants from the National Institutes of Health, Veterans Affairs, and US Department of Health and Health Services during the conduct of the study as well as personal fees from UpToDate and board service with the American Society of Addiction Medicine, Association for Multidisciplinary Education and Research in Substance use and Addiction, and International Society of Addiction Journal Editors outside the submitted work. Dr. Wright reported grants from the Patient-Centered Outcomes Research Institute (PCORI) during the conduct of the study and grants from Pfizer and grants from the National Institute on Drug Abuse outside the submitted work. Drs. Cochran and Hardy reported grants from PCORI during the conduct of the study. Dr. Wasan reported consulting fees from Greenwich Biosciences and grants from Parallel outside the submitted work. No other disclosures were reported.

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Data Availability Statement

Deidentified data are available per PCORI policy. A URL for data access is not yet available. Requests may be made to Dr. Kevin Kraemer at kek5@pitt.edu

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