

Brief Reports

Return Rates for Opioid versus Nonopioid Management of Patients with Abdominal Pain in the Emergency Department

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Abstract—Background: Research suggests that opioid treatment for abdominal pain, which comprises a large proportion of patients presenting to the emergency department (ED), may contribute to long-term opioid use without significant benefits with regard to symptom management. **Objectives:** This study seeks to assess the association between opioid use for management of abdominal pain in the ED and return ED visits for abdominal pain within 30 days for patients discharged from the ED at initial presentation. **Methods:** We conducted a retrospective, multicenter observational study of adult patients presenting to and discharged from 21 EDs with a chief concern of abdominal pain between November 2018 and April 2020. The proportion of 30-day return visits to the ED for patients who received opioid analgesics was compared with a reference group of patients who only received acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs), or both. **Results:** Of the 4745 patients, 1304 (27.5%) received opioids and 1101 (23.2%) only received either acetaminophen, NSAIDs, or both. Among those given opioids, 287 (22.0%) returned to the ED for abdominal pain within 30 days, compared with 162 (14.7%) of those in the reference group (odds ratio 1.57, 95% confidence interval 1.27–1.95, p -value < 0.001). **Conclusion:** Patients given opioids for abdominal pain in the ED had 57% increased odds of a return ED visit within 30 days compared with those given only acetaminophen or NSAIDs. This warrants further research on the use of nonopioid analgesics in the ED, especially in patients with anticipated discharge. Published by Elsevier Inc.

Keywords—abdominal pain; opioid; emergency department; return rates

Introduction

Abdominal pain is the most frequently seen presentation in the emergency department (ED), accounting for close to 8.7% of all ED visits (1). One study showed that, from 2000–2009, roughly 49% of patients presenting to the ED with abdominal pain were given an opioid (2). Patients treated with opioids experience high rates of return visits to the ED, raising questions about the efficacy of opioids in the treatment of abdominal pain (3,4).

Emergency physicians are often faced with difficult decisions between providing adequate pain management in the acute setting and contributing to the growing issue of widespread opioid addiction. Opioid prescriptions given in the ED increase the chances of long-term opioid use in formerly opioid-naïve patients and are estimated to contribute to about 10% of all abused opioids (5–7). In light of these statistics, emergency physicians must re-assess their frequent use of opioids and instead use alternative analgesics when appropriate.

This study evaluates the 30-day ED return rates for patients who presented with abdominal pain, were discharged from the ED, and returned to the ED within

30 days with the same chief concern, comparing patients who were treated with opioids with those who received nonopioid analgesia.

Materials and Methods

We conducted a retrospective, multicenter observational study using the electronic health records obtained from 21 academic and community EDs in Arizona, Florida, and the upper Midwest, all of which belong to an integrated health system. The Institutional Review Board deemed this study exempt from full review. We followed the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines to report its findings (8).

This study included all adult patients presenting to the ED between November 1, 2018, and April 1, 2020 with a chief concern of abdominal pain. Only patients who presented to the ED with abdominal pain and who were discharged from the ED were included. Data were restricted to only the first ED visit during the study period, and later visits from duplicate patients were excluded from the study (except as an outcome if the visit occurred within 30 days and the chief concern at the time of the return visit was abdominal pain). Patients who had declined research authorization were excluded from the study.

Patient demographics, including age, gender, and race/ethnicity, were collected. All medications given during their ED visit were recorded and all medications classified as analgesics were then categorized into the following classes: opioids, nonsteroidal anti-inflammatory drugs (NSAIDs), and acetaminophen. Based on the route of administration, opioid analgesics were further grouped as oral, intravenous (i.v.), or intramuscular (i.m.). The primary outcome was the presence of a return visit to the ED with a chief concern of abdominal pain within 30 days from the initial visit, determined via automated data extraction from the electronic health record.

The reference group for this analysis consisted of all patients who received only NSAIDs, acetaminophen, or both. Any patients receiving other medications were excluded from the reference group. The following were the groups of medications created to compare with the reference group: 1) Any opioid (oral, i.v., and i.m.); 2) oral opioids; 3) i.v. opioids; and 4) i.m. opioids. Any patients in one group receiving medications from another group were not excluded, leading to some overlap between the groups, in contrast to the organization of the reference group. Patients who received both an opioid and medication(s) from the reference group (NSAID, acetaminophen, or both) were included in the opioids group but excluded from the reference group.

The proportion of 30-day return visits to the ED among each group was then compared with the reference group. Using p -values < 0.05 for statistical significance, odds ratios (ORs) with 95% confidence intervals (CIs) were calculated using logistic regression models to illustrate the relative likelihood of a return visit among each medication group in comparison with the reference group.

Results

Of 9968 patients presenting to the ED with a chief concern of abdominal pain, 5480 (55.0%) were discharged from the ED. From these, 735 duplicate records were removed, yielding 4745 patients for inclusion in this study. Of the 4745 patients included, the mean age was 46.3 years (SD 19.2), 63.2% were female, 78.1% were White, 8.0% Black, 5.6% Hispanic, 2.4% Asian/Pacific Islander, 0.4% Native American, and 5.4% identified as another race/ethnicity.

In this cohort, 23.2% of patients received only NSAIDs, acetaminophen, or the combination of both without receiving any other analgesic, and these comprised the control group (Table 1). Of these patients, 14.7% returned with 30 days. In contrast, 27.5% of patients received an opioid, and, among these patients, 22.0% returned within 30 days. Of the patients receiving opioids, most received i.v. route (95.7% of all patients receiving opioids), compared with oral (3.2%) or i.m. (1.1% of total). Patients who received an opioid had an overall 30-day return rate of 22.0%, with return rates of 19.5%, 22.3%, and 25.0% for oral, i.v., and i.m., respectively.

Patients who received opioids via any route (oral + i.v. + i.m.) had higher odds of a return visit to the ED for abdominal pain (OR 1.57, 95% CI 1.27–1.95, $p < 0.001$) compared with the reference group of patients who did not receive an opioid (Table 2). Patients who received an i.v. opioid had similar increased odds of having a return visit to the ED for abdominal pain (OR 1.59, 95% CI 1.29–1.98, $p < 0.001$) compared with patients who did not receive an opioid. We were unable to assess the odds of a return ED visit separately for patients who received only an oral or i.m. opioid due to the low numbers of patients in these groups.

Discussion

In this study, patients given opioids for the management of abdominal pain in the ED were significantly more likely to return to the ED for abdominal pain within 30 days after discharge from initial ED presentation, as compared with those given only NSAIDs, acetaminophen, or the combination of both. Patients receiving an opioid via an i.v., i.m., or oral route had 57% increased odds of a return

Table 1. Frequencies of Different Medications Administered and Their Associated 30-Day Return Visit Rates

	Amount	Frequency	30-Day Return Visits	30-Day Return Visit Frequency
Opioids (oral+i.v.+i.m.)	1304	27.5%	287	22.0%
Acetaminophen	795	16.8%	127	16.0%
NSAIDs	1044	22.0%	188	18.0%
NSAIDs/acetaminophen only	1101	23.2%	162	14.7%

i.v. = intravenous; i.m. = intramuscular; NSAID = nonsteroidal anti-inflammatory drug.

Table 2. Comparison of the Likelihood of a 30-Day Return Visit Among Patients Receiving Opioids Via Any Route or Only the i.v. Route as Compared With the Reference Group of Patients Who Only Received Either NSAIDs, Acetaminophen, or Both

	OR	95% CI	p Value
Opioids (oral+i.v.+i.m.)	1.57	1.27–1.95	< 0.001
i.v. Opioids	1.59	1.29–1.98	< 0.001

OR = odds ratio; CI = confidence interval; i.v. = intravenous; i.m. = intramuscular.

visit to the ED within 30 days. It is unclear why patients who received an opioid were more likely to have a return ED visit. These patients may have had more severe pain. However, it is also possible that the opioids were ineffective, caused side effects such as nausea or constipation, resulted in opioid misuse, or other unwanted effects. Our findings suggest that clinicians should consider nonopioid analgesics more often for patients being discharged after abdominal pain evaluations.

The opioid crisis contributes to roughly over 33,000 deaths annually (9). With ongoing efforts to curb the misuse of opioids, emergency physicians share in the responsibility for maintaining the appropriate use of opioids for pain management. Currently, the high frequency of opioid prescriptions from ED visits have been linked to long-term opioid use disorders (10). This, in turn, has led to higher frequencies of ED visits for issues related to opioids and opioid misuse, with roughly 1–2% of all ED visits related to opioids in some manner (10).

Evidence shows that opioids may not be effective for all types of pain (11). Despite their role in treating musculoskeletal pain, there is a lack of strong support for the use of opioids in abdominal pain (11). In fact, in some infrequent situations, opioids may actually cause abdominal pain from etiologies such as opioid-induced constipation or narcotic bowel syndrome (11). From 2000–2009, there

was an increase in the relative frequency of analgesics given and a decrease in the time between presentation and initial analgesia administration for patients presenting to the ED with abdominal pain; however, there was no significant improvement in mean patient pain scores upon discharge (2). Therefore, emphasis should be placed on finding opioid alternatives, especially when they are shown to actually be more effective at pain control. There are documented alternatives to opioid use for the management of chronic abdominal pain, justifying the need to agree on similar alternatives in the setting of acute abdominal pain (11,12).

The findings in this study align with prior research suggesting the need to reevaluate the use of opioids for various types of pain in the ED (13–16). Prior research has demonstrated that treatment with opioids resulted in higher ED 30-day return rates as compared with nonopioid alternatives when used for the management of acute lower back pain (13). Similar findings have been shown in other ED-based studies focused on acute low back pain and acute extremity pain (14,15). These results suggest that the findings in this study may be applied to the management of various types of pain in future research.

Limitations

This study has several limitations. First, although the health care system sourcing the data is quite large, comprised of over 20 individual sites, patients could have visited sites outside this system and been lost to follow-up. Second, information on opioids prescribed for home use was not obtained in this study. In addition, although we compare the form of opioid provided (e.g., oral vs. i.v.), we do not compare type (e.g., hydromorphone vs. morphine) or dose, both of which may be relevant. Finally, we limited our comparisons to discharged patients, using this strategy to minimize differences in pain severity by eliminating those patients whose pain could not be controlled in the ED setting. Although the inclusion of pain scores may have provided some insight into choice of analgesics, we opted not to record these scores due to the subjectivity

inherent to their reporting and ongoing debate regarding their lack of reliability (17).

Conclusions

This study revealed that among patients presenting to the ED with a chief concern of abdominal pain and subsequently discharged, those who received opioids had 57% increased odds of a 30-day return visit for abdominal pain, compared with those who received only NSAIDs, acetaminophen, or both. Based on these findings, emergency physicians may want to further evaluate the use of nonopioid analgesics for the management of abdominal pain, which may avoid unnecessary opioid use while still providing adequate analgesia for patients. More research is needed on both pediatric and adult populations on the limitations of opioids and specific situations when they may not be as beneficial as nonopioid options, with an emphasis on developing guidelines for nonopioid analgesic use.

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ARTICLE SUMMARY

1. Why is this topic important?

Opioids prescribed by emergency physicians account for a significant proportion of abused opioids and therefore, their use should be limited whenever possible in the emergency department (ED). Abdominal pain is a common presentation to the ED, and opioids are often used for pain management.

2. What does this study attempt to show?

This study seeks to compare opioids as pain management to different analgesics, using 30-day return rates to the ED for those with a chief concern of abdominal pain as the primary outcome measured.

3. What are the key findings?

This study showed that patients given opioids for abdominal pain in the ED were 57% more likely to return for the same issue within 30 days as compared with those given just nonsteroidal anti-inflammatory drugs or acetaminophen.

4. How is patient care impacted?

With this information showing increased likelihood of a return visit when given opioids for abdominal pain, future research is now warranted to create further guidelines for management of abdominal pain. Patient care will benefit from effective pain management and the less frequent use of opioids, mitigating their potentially negative effects.