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The Effect of Surgical Consult in the Treatment of Abdominal Pain in Older Adults in the Emergency Department

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Abstract

Objective—To determine whether need for surgical consult contributes to delayed or reduced analgesic administration in older adults presenting to the ED with abdominal pain.

Methods—Secondary data analyses from a prospective cohort study consisting of adults 65 years in age presenting to the ED with a chief complaint of abdominal pain from 11/1/2012 through 10/31/2014. Measurements included administration of analgesics, time to administration, type given, and pain score reduction. Covariates for adjusted analyses included age, sex, race/ethnicity, and Emergency Severity Index.

Results—3,522 patients were included, of which 281 (8.7%) received any consult. Consult patients were less likely to receive any analgesic medication (53.0%) compared to non-consult patients (62.5%), relative risk (RR) of 0.80 (95% CI 0.70 to 0.91). However, among those patients receiving analgesic medications, there were no differences in likelihood of receiving an opioid, time to administration, or pain score reduction. When analyzing patients who received a surgical consult (n=154, 4.4%), these associations were notably stronger. Surgical consult patients had a lower rate of analgesic administration (46.8%) compared to non-consult patients (62.4%), RR = 0.75 (95% CI 0.63 to 0.89). Again, no differences were found in likelihood of receiving any opioid, time to administration, or pain score reduction.

Conclusion—Need for abdominal surgical consult is associated with decreased administration of analgesics in older patients, possibly indicating a continued need to improve management in this setting. This difference, however, did not impact pain score reductions.

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Keywords

Pain; Elderly; Abdomen; Consult; Geriatrics; Consultation; Abdomen; Pain Management

1. Introduction

1.1 Background

Pain is one of the most commonly reported chief complaints in the Emergency Department nationwide, with chest, abdominal and back pain as the three most prevalent types. In this urban tertiary care center's ED, abdominal pain is the most common pain complaint among older adults[1]. Seniors comprise a group that is particularly vulnerable to the adverse effects of pain, with 25–50% of community-dwelling older adults suffering pain that hinders their ability to function normally[1]. Yet despite the high prevalence of pain in the ED, patients of all ages experience inadequate pain control in this setting[2]. Furthermore, older adults are less likely than their younger counterparts to receive analgesics and to experience improvement in pain scores during their time in the ED.[1, 3]

There are numerous factors that may contribute to delayed or reduced analgesic administration in the ED, including crowding[4], physician training[5], or advanced patient age[6]. In older patients presenting with abdominal pain, an additional reason for oligoanalgesia may be the need for a surgical consult. *Cope's Early Diagnosis of the Acute Abdomen*, first published in the early 20th century, initially postulated that analgesics, particularly opioids, should be withheld from patients with abdominal pain until a surgical diagnosis and management plan had been made, in the belief that analgesics would interfere with accurate diagnosis[7]. These concerns, particularly common among surgeons, were used in a past period when pain was the only consistent diagnostic tool; today we rely on laboratory and imaging studies. Indeed, this belief has been largely discredited by multiple studies and a Cochrane review demonstrating that analgesic administration does not lead to inaccuracies in diagnosis; indeed, analgesics may make physical examination easier in patients with the acute abdomen[8–10]. Thus, a misunderstanding of the current evidence and data may lead to delayed pain care, inappropriately increased suffering, and poorer hospital outcomes for older patients in the ED.[11]

1.2 Importance

Poorly controlled pain in the older adult has numerous repercussions beyond patient discomfort. Further effects included greater risk for longer hospital lengths of stay[12], delirium[13], and development of chronic pain[14], which is associated with poorer physical performance[15]. Well-informed and adequate pain care is therefore important to minimize such consequences in the older abdominal pain patient in the emergency department.

1.3 Goal

The aim of this study is to determine whether the need for consult continues to impact the quality of pain care in the older acute abdomen patient in this ED.

2. Methods

2.1 Study Design and Setting

This was a secondary data analysis from an observational cohort study evaluating the quality of abdominal pain care for older adult patients who presented to an urban, academic tertiary care hospital in the northeastern United States.

2.2 Selection of Participants

From the original study, inclusion criteria were age 65+, a presenting chief complaint of abdominal pain from November 1, 2012 through October 31, 2014. Patients were included if their chief complaint was documented as “abdominal pain,” “abdominal cramping,” “abdominal injury,” and/or if the ED presenting complaint included the word “stomach,” “abdomen,” “abdominal.” This study received institutional review board approval with waiver of informed consent.

2.3 Methods and Measurements

Patient-related and pain care data were collected from the ED’s electronic health record (EHR), Epic ASAP—Epic Systems Corp, Verona, WI. All clinical data and clinician order entry data are entered and time stamped in the EHR, and patient charting and consult data may be extracted and sorted by presenting complaint using administrative Epic Workbench reports. Original study data included demographic and clinical data from both administrative report and chart abstraction. Research assistants (RAs) from the parent study were trained in chart abstraction prior to the start of the study, and had at least a 4-hour training session of the ED medical record abstraction process, with shadowing of at least 10 record reviews. Each RA independently completed at least 20 test abstractions and compared each with that of the investigator. The RA was qualified to abstract independently when test abstractions were completed with 95% agreement. Performance on abstractions was monitored, with the investigators randomly reviewing 10% of the charts. There was 100% inter-observer reliability of the variables of interest. As this study is a secondary analysis of a parent study, RAs who organized and prepared the original data were blinded to this study hypothesis. These methods were established and previously described by investigators of prior ED pain studies.[1, 16] Consult data were not blinded, however remain objective as these were generated by administrative Epic Workbench reports, and there was no subjective chart abstraction process involved. As this study evaluated the quality of pain care, missing patient data for receipt of analgesics or having a recorded pain score were treated as not being given or not being assessed.

The primary predictor variable was being seen by a consult. Two sets of cohorts were defined for the purposes of this study. First, a comparison was made between patients who received any consult against those who received no consult. Any consult included being seen by oncology, gynecology, gastroenterology, geriatrics, medicine, radiology, as well as surgical consult. Second, those who received an abdominal surgical consult were compared with those who did not receive abdominal surgical consult. Abdominal surgical consult included being seen by general surgery, urology, liver, vascular, and transplant consults.

Covariates for adjusted analysis included age, sex, race/ethnicity, and Emergency Severity Index (ESI, a validated five-point scale, 1 = acute, 5 = nonacute).

2.4 Outcomes

The outcome variables of interest included 1) administration of analgesics, 2) time to analgesic administration, 3) type of analgesic given, 4) final pain score, and 5) total pain score reduction.

Administration of analgesic was coded yes or no depending on whether analgesic of any kind was administered. Time to analgesic administration was defined as the minute time from triage to administration of medication. Type of analgesic given was measured by classifying medications as opioids, NSAIDs, or 'other,' as related to abdominal pain care. Opioids included morphine, codeine, fentanyl, hydromorphone, methadone, oxycodone, propoxyphene, propofol, and hydrocodone, as well as other combination opioid/nonopioid medications such as acetaminophen/oxycodone. NSAIDs included aspirin, ibuprofen, indomethacin, naproxen, and ketorolac. 'Other' medications included acetaminophen, baclofen, octreotide, lidocaine, laxatives, antacids, H2 receptor antagonists, and proton pump inhibitors. For patients who received any opioid, equianalgesic doses were calculated using standard conversions[17]. Final pain score and pain score reduction were measured using patient reported pain levels on a scale from 0–10, with 0 being no pain and 10 being severe pain.

2.5 Analysis

Descriptive analyses were completed of the cohort by consult status (all consults and surgical abdominal consults). Univariate analysis comparing predictors to pain outcomes were completed using chi-square and T-test analyses. Multivariable analyses were completed with linear and logistic regression models. Data non-normal in distribution (time data), were logarithmically transformed for statistical evaluation. All analyses were completed in SAS version 9.3.

3. Results

3.1 Cohort Characteristics

During the study period, there were a total of 3,522 ED visits by patients 65 and older who presented with a chief complaint of abdominal pain. Of these, 281 (8.0%) were seen by any consult while in the ED. Within that group, 154 (4.4% of entire study population) were seen by an abdominal surgical consult while 3368 (95.6%) did not. The characteristics of the study cohorts are listed in Table 1. There were no significant differences by consult category based on age, gender, race/ethnicity, or ESI.

3.2 Analgesic Use

Analgesic use varied based on need for surgical consult. Those patients who required a consult of any kind were found to be significantly less likely to receive any analgesic (149/289, 53.0%) when compared to non-consult patients (2026/3241, 62.5%), with a relative risk (RR) of 0.80 (95% CI 0.70 to 0.91). However, among those patients who did

received analgesic medications, there was no statistically significant difference in likelihood of receiving an opioid over other pain medications (61.0% vs. 59.7%, RR=1.04, 95% CI 0.84 to 1.27). Additionally, when comparing times to analgesic ordering between consult and non-consult patients, we found no statistical differences in time with logarithmically transformed values (see Table 2) (i.e., arithmetic non-log transformed consult times = 191 vs. non-consult time = 171, $p=0.49$).

When comparing patients who received an abdominal surgical consult versus those who did not, the association with likelihood of receiving analgesic medication was notably stronger. Surgical consult patients had a significantly lower rate of analgesic administration compared to non-surgical consult patients (46.8% vs. 62.4%, RR = 0.75, 95% CI 0.63 to 0.89). Again, among those who did receive pain medication, no statistically significant differences were found in likelihood of receiving an opioid (64.5% vs. 59.6%, RR= 0.93, CI 0.84 to 1.03), nor logarithmically transformed time to administration (see Table 2) (i.e. arithmetic non-log transformed surgical consult times = 204 min vs. 171 min, $p=0.30$).

3.3 Pain Assessment

No significant difference was found in pain care assessment between consult and non-consult patients. Both consult and non-consult patients were equally likely to have pain assessment documented (272/281, 96.8% vs. 3129/3241, 96.5% respectively, RR=1.08, 95% CI 0.55 to 2.10). Furthermore, there was no difference in final pain score or in total pain score reduction (see Table 3).

Similarly, abdominal surgical consult patients saw no difference in pain assessment and pain scores when compared with those who did not receive abdominal surgical consult. Both groups were equally likely to have documented pain assessment (149, 96.8% vs. 3252, 96.6%, RR = 1.06, 95% CI 0.44 to 2.56). There was no difference in final pain score or total pain score reduction (see Table 3).

4. Discussion

Abundant evidence suggests that pain treatment, including use of opioid analgesics, does not influence diagnostic ability in surgical abdominal pain patients, and thus should not be withheld. However, findings of this study demonstrate clinical practice and habits may be difficult to change, despite years of evidence dispelling these arcane habits. Indeed, our study suggests that for some EDs, old practices continue to impact the quality of patient care and patient suffering. We found that the need for any consult significantly reduces the likelihood of receiving analgesics in the older abdominal pain patient. Patients who required a surgical abdominal consult saw an even stronger association with lack of analgesic administration.

There are numerous other patient-related factors that have been shown to impact pain care in the emergency department, such as age, race, and gender. Additionally, ESI (Emergency Severity Index) naturally will influence analgesic administration, with more severe cases requiring more pain control. However, once these covariates were controlled for, need for

surgical consult continued to have an independent association with patients not receiving any analgesic for their pain.

Pain score reduction and final pain score were found to be statistically the same between consult and non-consult patients, two points that raise interesting questions. Indeed, these would seem to suggest that the reduced analgesia ultimately does not negatively impact patients who receive surgical consultation. However, the 0–10 pain scale itself is a multifactorial, subjective measure of pain that may be affected by numerous influences beyond analgesic medications. For example, it is possible that these patients took comfort in the care they were receiving, and thus subjectively felt better. Patients with abdominal pain may have also received additional care while in the ED (e.g. having oral food withheld, receiving intravenous hydration, etc.) that may have improved their clinical condition. While there are several factors that may influence a physician's decision to provide analgesic or not, need for surgical consult should not be one of them.

The primary implication of this study suggests that there may be a need for continued education regarding pain management of the surgical abdominal pain patient in the ED. The outdated standard of withholding analgesics in these patients appears to persist to some extent, despite the evidence that it is not necessary for diagnostic accuracy or assessment and formation of treatment plan. This may logically lead to increased pain and suffering, as well as unnecessary increased risk for longer hospital stays, development of chronic pain, and delirium, particularly in the older population. The findings of this study may help guide appropriate training for emergency physicians and staff and improve quality of care.

4.1 Limitations

Limitations of this study include its single-site design and results may not be generalizable to other institutions. However, because our findings are consistent with a longstanding clinical history of abdominal pain treatment in the setting of surgical consultation, it is not unreasonable to expect to find similar results elsewhere. Second, because of the retrospective design of the study, we are limited in our ability to account for the actual pain care received, and to determine the source of the differing pain care. For example, we cannot tell if the emergency physician decided to withhold pain medication until the consult was completed, or if the consulted surgeon requested that analgesics be withheld. In this study, missing data for analgesia or pain score were treated as not given or not assessed. Although it is certainly feasible that in some cases these were completed and simply not charted, we anticipate this to be unlikely.

Surprisingly, the remaining pain outcomes were not significantly impacted by consults. Namely, there was no difference in likelihood of receiving an opioid (if they received any analgesic at all), time to treatment, and more importantly final pain score or total reduction in pain score. While this study did not find an association with consults and delayed analgesic administration, the sample size may be too small to detect such an effect.

Finally, while abstractors responsible for patient-related and pain care data for the parent study were blinded to the study hypothesis, separate abstractors for consult data were not blinded. However, data for consult remain objective as they were generated by

administrative Epic Workbench report, and there was no subjective assessment made by these abstractors.

4.2 Conclusion

In conclusion, this study found that need for abdominal surgical consult is associated with decreased administration of analgesics for older ED patients with abdominal pain, possibly indicating a continued need to improve abdominal pain management in this setting. This difference, however, did not impact final pain score reductions.

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Table 1

Cohort Characteristics

Characteristics, n (%) unless otherwise specified	Consults N=281 (8%)	No consults N=3241 (92%)	p-value
Age in years, mean (SD)	75.6 (8.4)	75.4 (8.1)	0.66
Female	178 (63.3)	2034 (62.7)	0.85
Race/ethnicity:			
White	104 (37.0)	1019 (31.4)	0.51
Black	58 (20.6)	700 (21.5)	
Hispanic/Latino	98 (34.8)	1291 (40)	
Other/Unknown	21 (7.4)	230 (7.0)	
ESI, mean (SD) [1=acute, 5=non-acute]	2.90 (0.31)	2.87 (0.39)	0.18

Table 2

Analgesic Administration

N=3522	All consults N=281 (8.0%)	No consult N=3241 (92.0%)	Relative Risk (95% CI)	Surgical abdominal consult N=154 (4.4%)	No surgical abdominal consult N=3368 (95.6%)	Relative Risk (95% CI)
Received analgesic, n (%)	149 (53.0)	2026 (62.5)	0.80 (0.70, 0.91)	72 (46.8)	2103 (62.4)	0.75 (0.63, 0.89)
Received opioid, n (%)	94 (33.4)	1248 (38.5)	1.04 (0.84, 1.27)	43 (27.9)	1099 (32.6)	0.93 (0.84, 1.03)
Time to analgesic administration, Ln min (95% CI)	4.79 (4.64, 4.94)	4.74 (4.71, 4.77)	n/a	4.84 (4.62, 5.07)	4.74 (4.71, 4.77)	n/a

* Results remained significant in multivariable analyses adjusting for age, sex, race/ethnicity, ESI.

Table 3

Pain Assessment Outcomes

N=3522	All consults N=281 (8%)	No consult N=3241 (92%)	Relative Risk (95% CI)	Surgical abdominal consult N=154 (4%)	No surgical abdominal consult N=3368 (96%)	Relative Risk (95% CI)
Had pain assessment documentation, n (%)	272 (96.8)	3129 (96.5)	1.08 (0.55, 2.10)	149 (96.8)	3252 (96.6)	1.06 (0.44, 2.56)
Final pain score (95% CI)	2.89 (2.47, 3.31)	3.20 (3.07, 3.32)	n/a	2.87 (2.31, 3.44)	3.19 (3.06, 3.31)	n/a
Pain score reduction (SD)	3.58 (3.10, 4.06)	3.47 (3.33, 3.61)	n/a	3.43 (2.77, 4.09)	3.48 (3.34, 3.62)	n/a