Original Article

Emergency medicine providers' opioid prescribing practices stratified by gender, age, and years in practice

Shawn M. Varney¹, Vikhyat S. Bebarta², Lisa M. Mannina³, Rosemarie G. Ramos¹, Victoria J. Ganem^{4,5}, Katherine R. Carey⁵

¹ Department of Emergency Medicine, University of Texas Health Science Center, San Antonio 78229, USA

² Department of Emergency Medicine, University of Colorado School of Medicine, Aurora 80045, USA

³ Department of Emergency Medicine, Mike O'Callaghan Federal Medical Center, Nellis 89191, USA

⁴ Air Force Enroute Care Research Center, Fort Sam Houston 78208, USA

⁵ The Geneva Foundation, Tacoma 98402, USA

Corresponding Author: Vikhyat S. Bebarta, Email: Vikhyat.bebarta@ucdenver.edu, vikbebarta@yahoo.com

BACKGROUND: Emergency medicine providers (EMPs) prescribe about 25% of opioids, but the effect of EMP risk perception on decisions to prescribe opioids is unknown. This study was undertaken to identify factors that influence EMP risk and opioid prescribing practices.

METHODS: We distributed an anonymous questionnaire to EMPs at a military trauma and referral center. Response frequencies and distributions were assessed for independence using the Chi-square test.

RESULTS: Eighty-nine EMPs completed the questionnaire (100% response). Respondents were primarily younger male physicians (80%) in practice under five years (55%). Male EMPs were more likely to prescribe more opioid tablets than female ones both when and when not concerned for opioid misuse ($P < 0.001$, $P < 0.007$, respectively). Of the providers, 70% stated that patient age would influence their prescribing decisions. Hydrocodone and oxycodone were the opioids prescribed most frequently. About 60% of the providers reported changing their prescribing behavior would not prevent opioid misuse. Additionally, 40% of the providers believed at least 10% of patients seen at this military ED misused opioids.

CONCLUSION: Female EM providers reported prescribing fewer opioid tablets. Patient age influenced prescribing behavior, but the effect is unknown. Finally, EM providers reported that altering their prescribing behavior would not prevent prescription opioid misuse.

KEY WORDS: Prescription opioid misuse; Emergency medicine provider; Prescribing practices

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INTRODUCTION

Prescription opioid misuse, defined as taking a prescription opioid medication in a manner other than prescribed, is an epidemic in the US.^[1] Prescription opioids account for a four-fold increase in overdose deaths in the US (4 030 in 1999 to 16 651 in 2010), and these deaths currently outpace those attributed to heroin and cocaine combined.^[2,3] According to the Centers for Disease Control and Prevention, total opioids prescribed

in 2010 would medicate each US adult every four hours for one month.^[4] Although primary care providers prescribe the majority of opioids, it is estimated that emergency medicine (EM) providers prescribe up to 25% of all opioid analgesics.^[5]

EM providers have several factors to consider when treating patients for pain. Few reports have evaluated the effect of EMP risk perception on their decision to prescribe opioids.^[6] Thus, identifying factors that

influence EM provider risk perception and prescribing practices may provide opportunities to reduce prescription opioid misuse.

This study aimed to identify factors that influence EM provider risk perception and opioid prescribing practices when treating a patient for pain.

METHODS

Design

We administered an anonymous, 9-item, fixed response questionnaire to EM providers.

Setting

The study site was a Level I military trauma center that also serves as a tertiary care referral center for wounded warriors. The annual census was approximately 75 000 civilian and military patients, plus their beneficiaries. Of the patients, 78% were non-uniformed personnel. The local institutional review board approved this study.

Participants

Military and civilian EM providers licensed to write prescriptions for opioid medications were invited to participate in the study. The EM providers ($n=89$) included staff physicians, residents, and advanced practice providers (physician assistants [PAs], nurse practitioners [NP]).

The survey instrument was generated internally at our university since no validated tool existed to assess healthcare provider characteristics for prescribing opioids. We piloted survey questions on a small sample of emergency physicians, analyzed the responses, and then revised the questionnaire. Further piloting revealed consistent responses. Our run-in period of internal validation allowed us to improve our survey tool. We had input from our statistical expert and pain management specialist, and previous input from a collaborator who investigates opioid dependency and misuse.

A trained research nurse coordinator explained the study objectives and distributed the structured questionnaire to EM providers during two separate sessions lasting 30 minutes. The questionnaire asked about effect of patient demographic characteristics (e.g., age, gender, race) and provider's perception of patient well-being (e.g., risk for opioid misuse, access to care) on opioid-prescribing behavior, categorically defined as the number of tablets dispensed (e.g., 1–5, 6–10, 11–15, 16–20, and >20). The standard analgesic

dose at the study site was 5 mg hydrocodone/325 mg acetaminophen tablets. For this study, "opioid misuse" was defined as taking a prescription medication in a way other than prescribed (e.g., using a higher quantity, greater frequency, medication sharing, or ingestion of a prescribed opioid via another route or manner than originally intended).^[7,8]

De-identified data were collected and entered into a secured electronic database. Response frequencies and distributions were assessed for independence using the Chi-square test and Fisher's exact test for small sample sizes (STATA 11.0, College Station, TX). All analyses were stratified by provider characteristics (age, gender, level of training such as physician, PA, NP, and years in practice).

RESULTS

Eighty-nine EM providers completed the questionnaire (Table 1) for a 100% response rate. Respondents were primarily younger (53% were 35 years old or younger) males (80%) in practice fewer than five years (55%) (Table 2). With respect to the level of training, 80% of the respondents were physicians, 16% were PAs, and 4% were NPs.

We first assessed the effect of the EM providers' concern for patient wellbeing (e.g., potential for misuse) when considering an opioid prescription for pain. When not concerned for patient's wellbeing, male EM providers were more likely to prescribe more opioid tablets in each of the prescribing behavior categories ($P=0.007$). For example, females were more likely to prescribe 6–10 pills than males (28 vs. 11%) ($P=0.017$).

Table 1. Survey questions

Question 1	When NOT concerned for potential opioid misuse, how many opioid tablets do you generally prescribe for patients in pain?
Question 2	When concerned for potential opioid misuse, how many opioid tablets do you usually prescribe for patients in pain?
Question 3	Of the patients you see in the emergency department, what percentage do you think misuse opioids?
Question 4	Does ethnicity (race) influence your decision about prescribing opioids for pain?
Question 5	Does age influence your decision about prescribing opioids for pain?
Question 6	Which factors are barriers to proper pain management within the emergency medicine setting? (Circle all that apply)
Question 7	Do you believe that by altering your prescribing patterns (prescribing fewer opioids) you will help prevent opioid misuse, abuse, or addiction? (Circle response)
Question 8	Which opioids are you more likely to prescribe? (Please rank the top 5 medications with "1" being the most common.)
Question 9	Provider demographics

The greatest gender difference was among EM providers under 35 years of age ($P=0.027$) and those in practice five years or more ($P=0.001$) (Table 3). When concerned for patient's wellbeing, male EM providers were still likely to prescribe more opioid tablets in each of the prescribing behavior categories ($P=0.001$). For example, female providers were more likely to prescribe 1–5 pills (56%) compared with male providers (17%) ($P=0.001$). This prescribing difference was evident especially among providers under 35 years of age ($P=0.001$) and in practice less than five years ($P=0.003$).

Next, we assessed the providers' perception of prescription opioid misuse in our population with the following question: "Of the patients you see in the emergency department, what percentage do you think misuse opioids?" Overall, 40% of EM providers believed that at least 10% of patients seen at this military ED misused opioids. The response to the question was not affected by provider gender, age, or years in practice.

Table 2. Characteristics of responding emergency medicine providers

Characteristics	N (%)
Age (years)	
25–35	47 (53)
36–45	28 (31)
46–55	12 (13.5)
55 and older	2 (2)
Gender	
Male	71 (80)
Female	18 (20)
Type of provider	
Physician	71 (80)
Physician assistant	14 (16)
Nurse practitioner	4 (4)
Years in practice	
Less than 5 years	49 (55)
5 or more years	40 (45)

Table 3. Effect of provider characteristics and risk perception on opioid-prescribing behavior (e.g., 1–5, 6–10, 11–15, 16–20, and >20 tablets prescribed)

Provider characteristics	Measures of risk perception		
	NOT concerned about opioid misuse	Concerned about opioid misuse	Patient's age
Gender (Female [F] vs. Male [M])	$P=0.007$	F vs. M 1–5 tabs 56% vs. 17% ($P=0.001$)	$P=0.190$
Age	$P=0.092$	$P=0.27$	<35 vs. ≥35 years
Gender X Age	all quantities ($P=0.027^*$)	all quantities ($P=0.001^*$)	77% vs. 48% ($P=0.004^*$)
Years in practice	$P=0.279$	$P=0.65$	$P=0.043^{\Delta}$
Gender X years in practice	$P=0.001^{\#}$	$P=0.003^{\Delta}$	

ED: emergency department; EMP: emergency medicine provider; *: For only EMPs <35 years of age; #: For only EMPs ≥5 years in practice; Δ : For only EMPs <5 years in practice.

Regarding patient demographics, we asked our EM providers if patient's age or race/ethnicity affected their opioid-prescribing decision-making. Although 87% of them responded "No" to race/ethnicity (irrespective of provider gender, age, or years in practice), 70% stated that the patient's age would influence their decision. The effect of patient's age on opioid-prescribing behavior was strongest among EM providers younger than 35 years ($P=0.004$) and those with less than five years in practice ($P=0.043$). It was not clear whether the effect of a patient's age on the decision to prescribe opioids was driven by the patient's young or advanced age.

Proper pain management in the EM setting is challenging due to lack of follow-up. EM providers with more than five years in practice were more concerned about access to follow-up care when compared with those with less than five years in practice, but the comparison was not significant ($P=0.07$). When considering other barriers, more females than males were concerned about follow-up care, while more males than females were concerned about the patient manipulating them. However, both comparisons failed to be statistically significant.

We asked if our EM providers believed whether prescribing fewer opioids would prevent opioid misuse, abuse, or addiction. Approximately 60% of them (irrespective of gender, age, or years in practice) said changing their prescribing behavior would not prevent opioid misuse, abuse, or addiction.

Finally, our last question examined which class of opioids they would choose to prescribe. Our providers cited hydrocodone (e.g., Norco, Vicodin) as their primary "opioid of choice", followed by oxycodone (e.g., Percocet). These responses were similar between males versus females and early career (less than five years of practice) vs. established-career EM providers (greater than five years).

DISCUSSION

This study describes factors that emergency medicine providers in a military hospital stated would influence risk perception and prescribing practices when treating a patient for pain. Our analyses included stratification by gender, age, and years in practice. Although Tamayo-Sarver et al^[9] found marked variation in emergency providers' opioid prescribing practices, the group was unable to identify specific factors or predictors. In contrast, our study identified several predictive factors.

As one of our key findings, females reported that they were more likely to prescribe fewer opioids than males whether they were concerned for prescription opioid misuse or not. Perhaps female providers were more suspicious of patients' intentions than male providers, or simply more cautious. We found an equal concern among male and female providers regarding potential for creating opioid misuse in patients.

We also found an association between patient's age and prescribing behavior (e.g., number of tablets prescribed). Specifically, the influence of patient age on opioid prescribing behavior was significant when the additive effect of provider age and years in practice, a surrogate for experience, was considered. Heins et al^[10] found that the effect of years in practice was only predictive of analgesia administration in the emergency department, whereas we found that years in practice significantly predicted the opioid prescriptions upon discharge.

Lack of access to care (including follow-up) appears to be a risk perception among our respondents. This is consistent with the finding^[11] that in a family practice setting, providers were concerned whether system limitations increased the risk of patient opioid misuse, thus serving as barriers to appropriate analgesia.^[12] Hospital system limitations in our department include absence of social workers/substance abuse specialists and demand for operational efficiency. These limitations combined with patient expectations for pain relief in the ED (realistic or not), often result in oligoanalgesia due to hasty discharge opioid prescriptions.^[12] Additional factors that may influence the provider's risk perception of perpetuating opioid misuse include insufficient time to assess prescription history and fear of being manipulated by the patient. Interestingly, Grover et al^[13] reported that providers face difficulty in determining patients' motives, and this uncertainty impacts appropriate analgesia. We suspect that such barriers to adequate pain management may account for the perception among our EM providers that changing their prescribing behavior would not mitigate prescription opioid misuse.

Our EM providers reported prescribing hydrocodone more often than oxycodone, a trend reflective of other studies.^[14] Although hydrocodone is prescribed more frequently, oxycodone is responsible for a greater number of adverse events and emergency department visits.^[15]

Limitations

Our study has several limitations. It is an anonymous survey without respondent follow-up and relied on self-reported behavior instead of observed behavior. The

study was performed in a military hospital and may reflect differences; however, most of the patients were civilians. Next, we did not perform test/retest reliability and content validity statistics on the survey instrument at the time of the study. However, approximately 18 months after the initial survey we retested 12% of the original study population and obtained similar results. We plan to include reliability and validity measures in future versions of the survey tool. Also, the specific impact of patient age was not clear (patient's young age vs. advanced age). Closed-ended questions did not permit detailed provider explanations. The study's small sample size limited our ability to detect significant differences. The aforementioned limitations will be addressed in future iterations of the questionnaire.

In conclusion, we found that female emergency medicine providers reported prescribing fewer opioids. Additionally, patient age influenced younger provider prescribing behavior, but the exact impact is unknown. Finally, emergency providers reported that altering their prescribing behavior would not prevent prescription opioid misuse.

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