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Prescription of opioid analgesics for nontraumatic dental conditions in emergency departments

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ABSTRACT

Background: Opioid analgesics prescribed for nontraumatic dental conditions (NTDCs) by emergency physicians continue to receive attention because of the associated potential for misuse, abuse and addiction. This study examined rates of prescription of opioid analgesics and types of opioid analgesics prescribed for NTDC visits in U.S. emergency departments.
Methods: Data from the National Hospital Ambulatory Medical Care Survey from 2007 to 2010 were analyzed. Descriptive statistics and logistic regression analysis were performed and adjusted for the survey design.
Results: NTDCs made up 1.7% of all ED visits from 2007 to 2010. The prescription of opioid analgesics was 50.3% for NTDC and 14.8% for non-NTDC visits. The overall rate of opioid analgesics prescribed for NTDCs remained fairly stable from 2007 through 2010. Prescription of opioids was highest among patients aged 19–33 years (56.8%), self-paying (57.1%), and non-Hispanic Whites (53.2%). The probability of being prescribed hydrocodone was highest among uninsured patients (68.7%) and for oxycodone, it was highest among private insurance patients (33.6%). Compared to 34–52 year olds, children 0–4 years were significantly more likely to be prescribed codeine and less likely to be prescribed oxycodone. Compared to non-Hispanic Whites, non-Hispanic Blacks had significantly higher odds of been prescribed codeine and somewhat lower odds of been prescribed oxycodone, but it was not statistically significant.
Conclusions: There was no significant change in the rates of opioid analgesics prescribed over time for NTDC visits to EDs. Age, payer type and race/ethnicity were significant predictors for the prescription of different opioid analgesics by emergency physicians for NTDC visits.

1. Introduction

Opioid analgesics prescribed for both acute and chronic pain management by dentists, emergency and primary care physicians, physician assistants and nurse practitioners with prescribing authority have, in recent times continued to receive attention from policymakers, clinicians and patient care advocates. This is because of their increased use and the associated potential for misuse, abuse and addiction. Studies indicate that the number of opioid prescriptions filled by pharmacies increased by 27% (from 174 million to 238 million) between 2000 and 2011 (Manchikanti et al., 2012; Maxwell, 2011; Warner et al., 2011). In addition, Mazer-Amirshahi et al., 2014 reported that the number of opioid prescriptions in emergency departments increased from 20.8% to 31.0% indicating an absolute increase of 10.2% and a relative increase of 49.0% between 2001 and 2010. Another report documented that health insurers lose about $72.5 billion annually because of opioid prescription drug diversion (Coalition Against Fraud, 2007; National Prescription Drug Abuse Prevention Strategy, 2009). These descriptive statistics clearly identify increases in opioid prescriptions and the associated healthcare costs and public health implications.

Nontraumatic dental condition (NTDC) visits to emergency departments is increasing and has become a subject of discussion by researchers, clinicians, policymakers and organized dentistry (Okunseri et al., 2012, 2014; Allareddy et al., 2014). This increase in NTDC visits is of serious concern to all stakeholders because

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emergency departments are not set up to provide routine dental care nor are some ED physicians trained to provide extractions or endodontic treatment (Okunseri et al., 2012). Patients who visit EDs for NTDCs (such as toothache or tooth decay) typically receive prescriptions for painkillers and antibiotics. This has led to a discussion about whether the prescription of pain medication during such visits could be contributing to the prescription drug abuse problem (Fox et al., 2013). In addition, dental care in EDs have high cost implications and do not typically afford patients a chance to build relationships with a primary dental provider and to establish a dental home (Allareddy et al., 2014; Okunseri et al., 2012).

To the best of our knowledge, only one study has attempted to document emergency physician prescribing practices of opioid analgesics and opioid combinations for nontraumatic dental conditions (Okunseri et al., 2014). In addition, there is no study based on either a convenience or a population-based representative sample that has specifically examined the different opioids prescribed in emergency departments for NTDC visits. This is particularly important given that the rationale in favor of opioid prescriptions for pain management is often based on tradition, expert opinions, specialty focused guidelines, practical experience and uncontrolled anecdotal observations (Manchikanti et al., 2012). This study examined rates of prescription of opioid analgesics and types of opioid analgesics prescribed for NTDC visits in U.S. emergency departments from 2007 to 2010.

2. Methods

2.1. Study design, settings and selection of participants

We analyzed data from the National Hospital Ambulatory Medical Care Survey (NHAMCS) for 2007–2010. NHAMCS is a cross-sectional national survey of emergency and outpatient departments of non-institutionalized general and short-stay hospitals within the 50 states of the United States of America and the District of Columbia (Ambulatory Health Care Data, 2009). A four-stage probability design was used with sampling from primary sampling units (which are geographically defined areas), hospitals within primary sampling units, emergency departments within hospitals, and patient visits within emergency departments (Ambulatory Health Care Data, 2009). The data are collected by trained extractors based on review of medical records. Other data collected include socioeconomic status, race/ethnicity, financing of care, information regarding clinical presentation, diagnosis and treatment.

This study focused on nontraumatic dental condition-related visits, including all patients with dental conditions not related to trauma in the primary diagnosis field. This was in line with previous studies conducted by our research team as well as in other published studies that have analyzed dental visits to EDs and physicians' offices (Okunseri et al., 2008, 2011, 2012, 2014). Specifically, the following ICD-9-CM (International Classification of Diseases, 9th revision, Clinical Modification) codes were considered to be NTDC-related visits: 521.0–521.9 (diseases of dental hard tissues of teeth), 522.0–522.9 (diseases of pulp and periapical tissues), 523.0–523.9 (gingival and periodontal diseases), 525.3 (retained dental root), and 525.9 (unspecified disorder of the teeth and supporting structures) based on previous publication on the topic by researchers (Okunseri et al., 2008, 2011, 2012, 2014). The Medical College of Wisconsin and the Marquette University Institutional Review Boards approved the study as exempt.

2.2. Measures

The primary outcome measures chosen for this study were proportions of visits where patients received prescriptions for (i) any opioid-containing analgesic medication and (ii) an opioid prescription containing specific active ingredients (oxycodone, hydrocodone, codeine). The NHAMCS records up to eight medications associated with each ED visit. Opioid analgesic prescriptions were identified by searching the Multum Lexicon® codes for central nervous system agents (level 1 Lexicon code: 057) with analgesic therapeutic effects (level 2 Lexicon code: 058) that contain opioids (level 3 Lexicon codes 060, 191). Drugs and drug combinations containing specific active ingredients of interest were identified using the Ambulatory Care Drug Database maintained by the Centers for Disease Control (CDC) (http://www2.cdc.gov/drugs/ApplicationNav1.asp). The list of drugs for each specific ingredient was cross-referenced with the Multum category of opioid analgesics defined above. This approach eliminated opioid-containing medications prescribed for non-analgesic indications, such as codeine-based cough suppressants. Independent variables included in our analysis were age, gender, race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, Other), payer type or expected source of payment (Self-pay, Medicare, Medicaid, Private insurance, Other, Unknown).

2.3. Statistical analysis

We performed descriptive statistics and used multivariable logistic regression to examine the probability of receiving a prescription for any of the specific types of opioids in EDs for NTDC visits. Sample estimates were weighted to provide national estimates and standard errors were adjusted to reflect the complex sampling scheme of NHAMCS. The method employed for the adjustment of the complex sampling scheme was based on previous work done by authors such as Stone et al. (2000), Potthoff et al. (1992) and Tamayo-Sarver et al. (2004).

Age was categorized into six groups, with cut-offs chosen to approximate the lower and upper 10th and 25th percentiles, and the median in the entire population. A Rao-Scott χ^2 test was used to examine differences in the distribution of categorical variables. The trend in the proportion of patients with various opioids prescribed over time was evaluated using logistic regression. Based on findings from the descriptive statistics, calendar year was treated as a linear continuous predictor in the analyses. Reference groups are noted in the tables and text. An alpha level of 0.05 was used throughout to denote statistical significance. All statistical analyses were performed using SAS© software Version 9.3 (SAS Institute, Inc., Cary, NC), with the primary model fitted using the Surveylogistic procedure.

3. Results

Overall, NTDC was the primary diagnosis category for 1.7% of all ED visits from 2007 to 2010 (Table 1). The rate of prescription of opioid analgesics was 50.3% for NTDC and 14.8% for non-NTDC visits. The rates of prescription for each specific ingredient examined (hydrocodone, oxycodone, and codeine) were significantly higher for NTDC (31.6%, 12.3%, 4.1%, respectively) than for non-NTDC visits (9.3%, 3.4%, 1.0%) in ED. The proportion of Medicaid enrollees with NTDC (29.8%) and non-NTDC (24.7%) visits were highest, closely followed by Medicare enrollees in a reversed order with NTDC (6.3%) and non-NTDC visits (17.1%). Non-Hispanic Whites were over-represented among NTDC visits (63.7% vs 60.9%). Females represented slightly more than half of the population for both NTDC and non-NTDC visits during the study period. Rates of opioid prescription did not decrease significantly in EDs for NTDC visits, but rather fluctuated between 47.6% in 2007 to 52.1% in 2008, 50.8% in 2009 and to 50.6% in 2010. Similar findings were recorded for the rates of codeine and hydrocodone-containing prescription, while the proportion of patients receiving oxycodone increased from 9.7% to 14.5% ($p = 0.046$ for trend).

Table 2 shows that opioid prescriptions were highest among those aged 19–33 years (56.8%), self-paying patients (57.1%), and non-Hispanic Whites (53.2%). The prescription of opioids was lowest for children aged 0–4 years (4.5%) and the majority of those prescriptions were for codeine (77.6%). Uninsured patients had the highest probability of being prescribed hydrocodone (68.7%), while private participants had the highest probability of being prescribed oxycodone (33.6%).

Table 3 shows that in the multivariable analysis, among patients receiving an opioid prescription, compared to 34–52 year olds, children 0–4 years were significantly more likely to be prescribed codeine and less likely to be prescribed oxycodone. Compared to non-Hispanic Whites, non-Hispanic Blacks had significantly higher odds of been prescribed codeine and somewhat lower odds of been prescribed oxycodone, but it was not statistically significant.

4. Discussion

Public concern over the number of deaths attributed to opioids prescribed for therapeutic indications has prompted efforts to decrease misuse, abuse and diversion of opioid analgesics. In this study, the rate of prescription of opioid analgesics was 50.3% for NTDC visits in 2007–2010. Although the rate of prescription of opioid analgesics remained fairly stable, it was, however, higher than previously reported by Okunseri et al. (2012, 2014) where 38% of NTDC patients were prescribed opioids in 1997–2000 and 45% in 2003–2007. This clearly demonstrates a steady increase in the rate of prescription of opioid analgesics for NTDC visits in EDs over time.