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IMPACT OF CLINICAL PHARMACISTS ON INITIATION OF POSTINTUBATION ANALGESIA IN THE EMERGENCY DEPARTMENT

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☐ **Abstract—Background: Pain and anxiety are common in mechanically ventilated patients, and frequently undertreated in the emergency department (ED) setting. Objective: We sought to compare the rate of initiation of postintubation analgesia in the ED before and after intervention by pharmacists specialized in emergency medicine. Methods: This was a retrospective cohort study of patients who underwent rapid sequence intubation (RSI) in the ED. The primary endpoint was overall frequency of analgesia initiation, with subset analysis of RSI during the ED pharmacist (EDP) duty hours. Secondary endpoints included frequency of sedative or anxiolytic use without analgesia, time to initiation of postintubation analgesia, and adverse drug events (ADEs) resulting in analgesia discontinuation. Results: Forty-one patients were included in each group. The overall rate of postintubation analgesia increased after pharmacist intervention, from 20% to 49% (p = 0.005). Analgesia initiation during EDP hours was 50% and 85% in the pre- and postintervention groups, respectively. In the preintervention group, more patients received sedation without analgesia (73% vs. 51%; p = 0.04), and a small percentage (7%) received neither sedation nor analgesia. Time to initiation of postintubation analgesia decreased from 98 min to 45 min. ADEs were rare: there were no discontinuations of analgesic therapy in the preintervention group and one temporary discontinuation because of hypotension in the postintervention group. Conclusion: Analgesic use after RSI in the ED significantly increased after the implementation of ED pharmacy services. The large proportion of patients receiving analgesia during the EDP duty hours suggest the increase may be related to direct pharmacist involvement in postintubation management.** © 2016 Elsevier Inc.

☐ **Keywords—emergency service, hospital; hypnotics and sedatives; intubation, intratracheal; pain management; pharmacy service, hospital**

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INTRODUCTION

Mechanically ventilated patients frequently experience pain and anxiety caused by the physical and emotional discomfort of the endotracheal tube being in place, various modes and settings of ventilation, persistent effects of paralytic agents, and ongoing resuscitative procedures (1–5). Intubated patients are often unable to communicate these concerns, and physiologic signs of pain, including tachycardia and hypertension, may be unreliable because of medication use and underlying pathologies (3). Untreated pain may induce adverse effects related to catecholamine release (2–7). Agitation may be a direct manifestation of inadequate pain control, leading to an increased use of sedative and anxiolytic agents (3,4). Conversely, patients who receive adequate analgesia are able to reach comfort goals with less supplemental anxiolytic medication and may be weaned from mechanical ventilation sooner (6–10).

Guidelines have increasingly supported the use of analgesics in critically ill and mechanically ventilated patients (3–6). However, postintubation analgesia in the

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emergency department (ED) is often absent or inadequate. A retrospective evaluation of trauma patients intubated in the ED found that only 51% of patients received pain medication, usually a single bolus dose opiate (11). Only 47% were given analgesia in another study assessing analgesic and anxiolytic use in ED-intubated patients regardless of trauma status (5). Of these, 25% received an adequate dose. A recent study found similar results: 46% of ED-intubated patients received any form of sedation, and only one-quarter of these received an opioid during their ED stay (12).

Clinical pharmacists in the ED are important adjuncts to the resuscitation team who optimize and facilitate the provision of medication therapy (13,14). Upon establishing pharmacy services in our ED, we noted that most intubated patients were not receiving analgesia. In the course of recommending analgesic therapy, we identified several common barriers to its use: physician belief that pain control was not needed for intubated patients; the incorrect assumption that propofol provides both sedation and analgesia; fear among nurses and physicians that opiates would cause more hemodynamic instability than sedative agents alone; and concern for the amount of time required to initiate an infusion because none were readily available in the ED. We provided targeted education in addition to clinical and operational interventions to address these barriers.

This study was conducted in order to quantify the initiation of ED postintubation analgesia before and after education and intervention by clinical pharmacists specialized in emergency medicine. We hypothesize that clinical pharmacists improve the frequency of analgesia initiation in ED patients undergoing rapid sequence intubation (RSI).

METHODS

Study Design and Setting

This was a retrospective cohort study conducted at a community teaching hospital licensed for 480 beds. The mixed adult/pediatric ED sees approximately 60,000 patient visits per year, with 25 acute care beds and a fast track area. Beginning in October 2010, 2 ED pharmacist specialists (EDPs) provided clinical services (e.g., therapeutic recommendations, antimicrobial stewardship, medication counseling, drug information consults, medication procurement and unit stock optimization, and bedside assistance for cardiac arrests, myocardial infarctions, strokes, procedural sedations, RSIs, etc.) from 10 AM to 8:30 PM, seven days per week. This study was approved by the hospital's institutional review board before patient selection or data collection.

Interventions

In order to overcome the supply inconvenience, the EDPs arranged to have premixed fentanyl infusions stocked in the ED's automated dispensing cabinet (ADC). The EDPs notified nurses and physicians of the addition and began educating ED staff about the importance of providing postintubation analgesia. Pharmacology of sedatives and analgesics was reviewed, including therapeutic and adverse effects of these agents. Printed drug information was posted by the ADC and the pharmacy communication board in the ED conference room, but most opportunities for physician and nurse education occurred in the course of patient management. The EDPs initiated therapeutic dialogues with attending and resident physicians by directly recommending analgesic therapy as part of the postintubation regimen. They also provided opportunities to expedite therapy by being able to enter and verify the analgesic orders and obtain the medications from the ADC. In addition, EDP involvement at the bedside facilitated the provision of patient-specific drug information, such as compatibility with other intravenous medications and dosing and titration guidance. Being physically present in the ED, the pharmacists were also available to answer general questions and participate in discussions that did not arise from specific cases.

Selection of Participants

Eligible providers were those involved in caring for patients undergoing RSI while in the ED. Emphasis was placed on attending emergency physicians, resident physicians, and registered nurses.

Patients were identified by searching the ADC historical database for sedative and paralytic medications commonly used in RSI (i.e., succinylcholine, rocuronium, vecuronium, etomidate, midazolam, fentanyl, propofol, and ketamine). Two time periods were searched: preintervention (January 1, 2010–June 30, 2010) and postintervention (January 1, 2011–June 30, 2011). Data were collected on patients ≥18 years of age who had undergone RSI (receiving both a sedative and a paralytic agent) in the ED with an ED duration of stay of ≥30 min postintubation. Patients were excluded if they were <18 years of age. Patients who did not undergo RSI in the ED, required RSI because of opiate or benzodiazepine overdose or cardiac arrest, had documented allergies to opiates, had documented avoidance of analgesia because of hypotension, received direction of postintubation care by non-ED providers (e.g., intensive care unit or outside hospital), had an ED duration of stay of <30 min, or died while in the ED were excluded because of the inability to assess analgesia timing and