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Emergency nurses practices in assessing and administering continuous intravenous sedation for critically ill adult patients: A retrospective record review'

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ABSTRACT

Aim: To generate an initial profile of emergency nurses' practices in and factors influencing the assessment and administration of continuous intravenous sedation and analgesia for critically ill mechanically ventilated adult patients.
Background: Emergency nurses are relied upon to assess and manage critically ill patients, some of whom require continuous intravenous sedation. Balancing sedation is a highly complex activity. There is however little evidence relating to how emergency nurses manage continuous intravenous analgesia and sedation for the critically ill intubated patients.
Design: Descriptive study.
Method: A 12-month retrospective medical record review was undertaken from January to December 2009 of patients (>16 years) administered continuous intravenous sedation in ED.
Results: Fifty-five patients received ongoing intravenous sedation within the ED during a median length of stay of 3.4 h. Assessment of patient depth/quality of sedation and pain-relief varied and were rarely documented. Adverse events were documented, majority (16%) drug administration related. Thematic analysis identified three themes: 'Maintaining sedation', 'Directionless-directions', and 'Navigating the balance'.
Conclusion: Emergency nurses provide continuity of patient care and optimisation of analgesia and sedation for critically ill sedated patients. The safety and effectiveness of continuous intravenous sedation for the critically ill adult patient in ED are dependent on the expertise and decision-making abilities of the nurse.

1. Introduction

The number of critically ill patients presenting to public hospital emergency departments in Australia has increased by 34% since 2008 (Australian Institute of Health and Welfare, 2008, 2010, 2013). While critical care was traditionally viewed as being delivered only in intensive care units, emergency departments (ED) provide critical care to a range of patient groups with varying frequency and lengths of stay (Chalfin et al., 2007; Nguyen et al., 2000). Critically ill patients experiencing life-threatening illnesses or injuries may go on to require mechanical ventilation, and continuous intravenous analgesia, sedation and other pharmaceutical agents to prevent delirium (Reade and Finfer, 2014). Complications and adverse events have been noted to arise from maintaining patients at deeper sedation levels than necessary (Shehabi et al., 2013), and has been associated with higher levels of patient mortality ranging from 30% to 52% (Barr et al., 2013; Rodrigues and Do Amaral, 2004). While the use of analgesia and sedation in ED is not new, emergency nurses are increasingly responsible for the continuing assessment, monitoring and titration of analgesia and sedation for critically ill intubated patients (Emergency Nurses Association, 2008; Nguyen et al., 2000; Varndell et al., 2013).

2. Background

Adequate analgesia and sedation are essential in optimising comfort, pain-relief and well-being of critically ill mechanically ventilated patients (College of Emergency Nursing Australasia, 2011, Rose and Gerdtz, 2007), who are often inflicted with a barrage of noxious stimuli such as insertion of endotracheal tubes, central venous catheters and monitoring devices. Mechanically ventilated patients require carefully balanced analgesia and sedation administration in line with their needs and physiological tolerances (Bahn and Holt, 2005; Miner et al., 2005)

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to avoid jeopardising patient safety. Inadequate titration of analgesics and sedatives can lead to increased patient agitation, self-extubation, increased oxygen consumption, patient–ventilator dyssynchrony, haemodynamic instability and injury to self and others (Girard et al., 2008; Kress et al., 2007; Samuelson et al., 2008; Shehabi et al., 2013; Treggiari et al., 2009). Currently, it is recommended that patients should be maintained at a light level of sedation, to avoid the increasing risks associated with deeper levels of sedation (Barr et al., 2013; Shehabi et al., 2013). It is therefore critical that emergency nurses, in addition to frequently assessing the physiological state of the patient, also ascertain patient depth of sedation and the presence of pain. However, while emergency nurses are best placed to augment pain-relief and sedation, it is a highly complex activity requiring education and training beyond that which is provided at a pre-registration level (Aitken et al., 2009; Varndell et al., 2014). To date, there is little evidence within the literature relating to ED nurse assessment and administration practices of continuous intravenous analgesia and sedation for the critically ill intubated patient. The aim of this study was therefore to (1) generate an initial profile of emergency nurses' practices in and (2) factors influencing the assessment and administration of continuous intravenous analgesia and sedation for critically ill adult patients.

3. Methods

A 12-month retrospective medical record review was undertaken from January to December 2009 of patients (>16 years) administered continuous intravenous sedation in ED. Medical records were reviewed to answer the following questions:

(i) What is the prevalence and characteristics of critically ill intubated patients that received intravenous sedation and analgesia?
(ii) What type of intravenous sedatives and analgesics were being administered to critically ill intubated patients?
(iii) What types of assessment guided emergency nurses when administering continuous intravenous sedation?
(iv) How did emergency nurses document assessing and titrating continuous intravenous sedation and analgesia?

A descriptive study was undertaken, as this was considered appropriate given that little information exists on the subject within the context of ED (Joacobsen, 2011). Study findings would later be used to generate hypotheses that then would be tested prospectively (Hess, 2004). The study was guided by the work of Gearing et al. (2006), and was approved by the local Human Research Ethics Committee in line with the National Health and Medical Research Council guidelines.

3.1. Setting and staff

The study was conducted at a 35-bed metropolitan tertiary referral ED in Sydney, Australia. Annually, the department manages over 48,000 patient presentations with an average occupancy rate in excess of 90%. The department's acute bed-base of 25 is divided between resuscitation bays ($n = 3$), acute ($n = 12$), sub-acute areas ($n = 10$) and short-stay unit ($n = 10$). The ED is supported by a 12-bed tertiary referral intensive care unit (ICU). At the time of the study, there were 106 registered nurses employed at the study site, over two-thirds ($n = 72$; 69%) were regularly rostered to work in the resuscitation area. Of the emergency nurses regularly rostered to work in the resuscitation area, 41 (57%) had post-graduate and above qualifications in emergency nursing, and 12 (17%) had previously worked in ICU for more than 1 year.

3.2. Sample

All critically ill adult patients requiring intravenous continuous sedation, mechanical ventilation and ICU admission that presented to the ED from January 1st to December 31st 2009 were included in the medical record review.

3.3. Data collection

Eligible cases were identified by searching the study site's ED electronic patient medical record system (Cerner Corporation, 2009) for patients admitted to ICU during the review period. Corresponding medical records were then retrieved and reviewed. Patient medical records were examined using a documentation audit tool developed from the literature and piloted as part of this study. The following patient data were collected: date and time of arrival, time from arrival to registration and triage, age, gender, triage category, international classification of disease (version 10) code, diagnosis, ED length stay, amount and frequency of intravenous sedatives, analgesics and paralysing agents, time from commencement of continuous intravenous sedation to transfer to ICU, heart rate, respiratory rate, blood pressure, level of consciousness, temperature, peripheral oxygen saturation, end-tidal carbon dioxide levels and pain score. Numerical data were transcribed into a computer-based spreadsheet. Textual data from medical and nursing clinical documentation and medication charts were transcribed verbatim into NVivo (version 10) software (QRS International Pty Ltd, 2012).

3.4. Development of the documentation audit tool

Initial tool development was informed by studies exploring procedural sedation and intubation practices in the ED (Green and Yealy, 2009; Innes et al., 1999). In addition, all relevant national and international guidance were reviewed to further inform the creation of the final audit tool (Fig. 1). Quantitative items included patient demographics, type of induction and sedation agents used and number of boluses of pharmacological agents used to alter patient sedation, pre-sedation vital signs, sedation agent selection, dose and frequency of use, and frequency of patient vital signs monitoring. Qualitative items consisted of: indication for sedation, any reported complications, sedation management plans, and written documentation pertaining to patient assessment and monitoring by nursing, medicine and allied health. The tool was piloted for its suitability and data collection accuracy on 20 medical records selected at random by a medical records clerk not associated with the study (Baker, 1994; Schneider, 2013; Van Taijlingen and Hundley, 2002). Following piloting, the item 'frequency of patient vital signs' was divided into 15 minutely quotients for the first hour, then hourly.

3.5. Data analysis

Descriptive statistics were used to first describe the numerical data and sample using SPSS (version 21) (IBM, 2011). Range, interquartile range and median were used to describe age, time of arrival to ED, ED length of stay, and time of drug administration (Machin et al., 2007). Frequency and percentages were used to describe patient triage category. Patient physiological data (i.e. vital signs) were coded into one of four categories as defined by the work of Jacques et al. (2006): normal, abnormal, early deterioration and late deterioration. Parametric and non-parametric techniques were used when comparing sedated and non-sedated critically ill patient data where appropriate. Chi-square testing was used for patient gender. Mann–Whitney U testing was used to test for differences in patient age, category of urgency and total ED length of stay between sedated and non-sedated patient cohorts (Rubin, 2009). In all statistical comparisons, a p-value of <0.05 was considered significant (Rubin, 2009). Textual data were transcribed verbatim into NVivo (QRS International Pty Ltd, 2012), verified against the originating medical record entry, and then examined using a five step thematic analysis approach by Braun and Clarke (2006). Each theme and its associated codes were