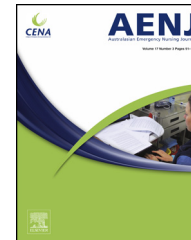




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RESEARCH PAPER

Medication errors in ED: Do patient characteristics and the environment influence the nature and frequency of medication errors?



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KEYWORDS

Emergency medicine;
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Patient safety;
Risk management;
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Summary

Background: Medication safety is of increasing importance and understanding the nature and frequency of medication errors in the Emergency Department (ED) will assist in tailoring interventions which will make patient care safer. The challenge with the literature to date is the wide variability in the frequency of errors reported and the reliance on incident reporting practices of busy ED staff.

Methods: A prospective, exploratory descriptive design using point prevalence surveys was used to establish the frequency of observed medication errors in the ED. In addition, data related to contextual factors such as ED patients, staffing and workload were also collected during the point prevalence surveys to enable the analysis of relationships between the frequency and nature of specific error types and patient and ED characteristics at the time of data collection.

Results: A total of 172 patients were included in the study: 125 of whom patients had a medication chart. The prevalence of medication errors in the ED studied was 41.2% for failure to apply patient ID bands, 12.2% for failure to document allergy status and 38.4% for errors of omission. The proportion of older patients in the ED did not affect the frequency of medication errors. There was a relationship between high numbers of ATS 1, 2 and 3 patients (indicating high levels

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of clinical urgency) and increased rates of failure to document allergy status. Medication errors were affected by ED occupancy, when cubicles in the ED were over 50% occupied, medication errors occurred more frequently. ED staffing affects the frequency of medication errors, there was an increase in failure to apply ID bands and errors of omission when there were unfilled nursing deficits and lower levels of senior medical staff were associated with increased errors of omission.

Conclusions: Medication errors related to patient identification, allergy status and medication omissions occur more frequently in the ED when the ED is busy, has sicker patients and when the staffing is not at the minimum required staffing levels.

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What is known

- Observations of clinical practice suggest that medication administration in the Emergency Department (ED) can be challenging with multiple unknown patients requiring time critical medications at once.
- It has been identified that delays in medication administration in the ED lead to increased in-patient mortality and increased patient and family dissatisfaction.
- It was identified that 60% of patients had one or more medication errors (178 errors in 192 patients) and 37% of medication errors reached the patient.
- It is estimated that 2.3% of medication errors in the ED are medication prescription errors and that 2.1–36.0% of medication errors in ED are administration errors.

What this paper adds

- The conditions in the Emergency department when medication errors are more likely to occur.
- The frequency of medication errors when incident reporting systems are not used for data collection.
- The use of observation as means for data collection in medication errors.

Introduction

Observations of clinical practice suggest that medication administration in the Emergency Department (ED) can be challenging with multiple unknown patients requiring time critical medications at once. Commonly, ED patients are administered analgesics for pain and antibiotics for treatment of infection.^{1,2} It has been identified in previous studies that ED patients are particularly prone to delays in medication administration, particularly related to analgesia.^{3–5} A number of studies have identified between 68% and 80% of patients experience a delay to analgesia of greater than 1h.^{3,4} A further study by Kanjia and Dumaresque⁵ identified that only 34% of patients with septic shock received antibiotics within the recommended 1h timeframe. It has been identified that delays in medication administration in the ED lead to increased

in-patient mortality^{5,6} and increased patient and family dissatisfaction.⁷

The ED provides an environment where the opportunity for medication errors to occur is high for a variety of reasons. The most compelling reason is the volume of medications administered and the time critical nature of medication administration. First, each ED patient receives an average of 2.5 medications per episode of care.⁸ Second, high numbers of patients requiring emergency care increases the risk of errors as multiple patients require treatment concurrently, often by the same clinicians. As the burden of chronic disease increases,⁹ ED patients are becoming more complex. They often have complicated past medical histories and require medications to manage chronic conditions in addition to the acute medical condition that led to the ED presentation that also often requires treatment with medications.⁸ Third, the need for ED clinicians to administer a wide variety of medication to patients of all ages increases the risk of error. A lack of familiarity with a medication requires additional time to review the medication literature to determine how to prepare the medication for administration. The opportunity for error arises for busy clinicians who may seek alternate advice on the preparation of the medication from colleagues or prepare the drug as they would any other intravenous medication.⁸ Most other units of the hospital will treat clusters of patients with 'like' illnesses, such as neurology, cardiology or orthopaedics, thus providing clinicians with some familiarity with the medications administered.

Medication errors were included for further exploration in this study based on the highly variable findings of previous studies that show medication errors contribute to between 1.35% and 60% of all errors in emergency care.^{8,10–18} There was one prospective study identified through the literature review, this paper described the frequency of medication administration and prescription errors in ED.¹³ It was identified that 60% of patients had one or more medication errors (178 errors in 192 patients) and 37% of medication errors reached the patient. Of the errors identified, 38.4% were classified as medication administration errors and 53.9% were classified as prescribing errors.

It is estimated that 2.3% of medication errors in the ED are medication prescription errors¹⁹ and that 2.1–36.0% of medication errors in ED are administration errors.^{14,15} In order to improve medication administration safety, Blank et al.⁸ used a pre-test post-test study to determine if the number of medication errors at one study site could be reduced by re-focusing nursing clinicians on

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