The Effect of Implementing Computerized Provider Order Entry on Medication Prescribing Errors in an Emergency Department

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Medication errors are a major concern in the Emergency Department (ED). We examined medication prescribing errors among consecutive adult ED patients during two 10-day periods before and during one 9-day period after implementing computerized provider order entry in an adult ED. 2,073 patients had 5,950 orders. Before (after) implementation there were 3.7 (2.8) potential adverse drug events, 222.0 (21.0) medication prescribing errors, and 5.1 (0) rule violations per 100 orders.

INTRODUCTION

According to the Institute of Medicine report “To Err is Human: Building a Safer Health System” the Emergency Department (ED) setting accounts for a large number of medical errors. The ED setting experiences a high volume of information exchange and is characterized by multi-tasking, ongoing interruptions, and frequent handoffs, potentially leading to increased error rates. The ED is vulnerable to medication errors as clinicians provide episodic care to patients in emergent or urgent situations. Overcrowding episodes, nurse shortage, and scarcity of hospital beds continue to challenge effective and safe information management strategies.

The implementation of computerized physician order entry (CPOE) demonstrated potential to reduce medication errors. In the ED, however, there is limited information about the effect of implementing CPOE on medication errors. The goal of the study was to examine medication prescribing errors before and after implementing CPOE in an adult ED.

METHODS

The adult ED implemented CPOE in March 2004. We obtained medication orders for all consecutive adult ED patients from the patient’s paper chart and the CPOE system during two 10-day pre-implementation periods (period 1: 6/2/2003 to 6/11/2003; period 2: 1/26/2004 to 2/4/2004) and a 9-day post-implementation period (chart retrieval rate after 3 attempts: 96.9%). A clinical pharmacist categorized medication errors into potential adverse drug events (pADE), medication prescribing errors (MPE), and rule violations (RV) following published error classification methodology1,2. Multiple MPEs and RVs within an order were counted separately allowing for >1 MPE or RV per order. A 2nd clinical pharmacist abstracted a 10% random sample.

RESULTS

From 2,073 patients a total of 5,950 orders (range: 1-25 orders) were examined. CPOE implementation decreased the number of pADEs from 3.7 to 2.8/100 orders, MPE from 222.0 to 21.0/100 orders, and eliminated RVs (Table). Allergies to medications accounted for the highest rate of pADEs (pre: 3.0/100 orders; post: 2.5/100 orders). Missing order information decreased from 194.3 to 5.1/100 orders, primarily due to available ordering dates/times in CPOE. RVs were eliminated (pre: 5.1/100 orders).

DISCUSSION

Compared to a study in the pediatric intensive care unit of the same institution2, the ED observed similar rates of reduced medication prescribing errors for pADEs, MPEs, and RVs. CPOE implementation in an adult ED was associated with a substantial decrease of medication prescribing errors.

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References: