Saudi Pharmaceutical Journal (2014) 22, 429–432

King Saud University

Saudi Pharmaceutical Journal

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ORIGINAL ARTICLE

Factors contributing to the identification and prevention of incorrect drug prescribing errors in outpatient setting

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Received 18 August 2013; accepted 10 November 2013
Available online 19 November 2013

KEYWORDS
Medication errors;
Wrong drug;
Medication indication

Abstract *Purpose:* Medication errors in prescribing are common and could lead to high morbidity and mortality. The objective of the current study was to explore factors that help pharmacists identify and thus prevent harm from incorrect drug prescribing errors in an ambulatory care setting.

Methods: At the King Faisal Specialist Hospital and Research Center, a tertiary care referral hospital in Riyadh, Saudi Arabia, medication error reports from the pharmacy are initiated by the pharmacist and reviewed by the quality control department and medication safety officer. This was a retrospective study in the hospital ambulatory care pharmacies including incorrect drug error reports from January 2011 until September 2012. Reports were reviewed by two pharmacists to ensure the accuracy of data classification. Factors contributing to the identification of incorrect drug prescribing errors were identified.

Results: During the study period, a total of 2073 prescribing errors were included in the hospital Safety Reporting System. Incorrect drug prescribing errors identified by pharmacists comprised 203 reports (10%). Factors contributing to the identification of incorrect drug prescribing errors were: matching the drug with the indication for prescribing included in the prescription (34%), reviewing the patient's medication history (27%), patient counseling and review of medication history (9%), patient counseling during dispensing (8%), others (15%), and not specified by the reporter (7%).

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Peer review under responsibility of King Saud University.

Production and hosting by Elsevier

http://dx.doi.org/10.1016/j.jsps.2013.11.003

Conclusions: Pharmacists reviewing and matching the indication for prescribing the prescribed drug and reviewing patient medication history before dispensing were the major factors (60%) found that allowed pharmacists to detect and thus prevent incorrect drug prescribing errors. Therefore, including the indication in the prescription as a mandatory field is important for patient safety.

1. Introduction

Medication errors are any barrier that prevents the right patient from receiving the right drug in the right dose at the right time through the right route of administration, at any stage in the medication use process, with or without the occurrence of adverse drug event (ADEs) (California Healthcare Foundation, 2001). It represents the largest single cause of errors in the hospital setting in the United States, and exceeds the number of deaths from motor vehicle accidents, breast cancer or AIDS (Kohn et al., 1999).

Medication errors are an important leading cause of patient mortality and morbidity in hospitals (Lazarou et al., 1998; Barber and Rawlins, 2003; Philips et al., 2001). On the other hand, it is considered one of the most challenging problems in any health care system; in the United States, medication errors are estimated to harm at least 1.5 million patients per year (Agrawal, 2009). Furthermore, one out of every 131 outpatient deaths is related to medication errors, and it has been estimated that medication errors cost the US healthcare system around $177 billion annually (Kohn et al., 1999).

Medication errors in the United States account for more than 7000 deaths annually, which is greater than the number of deaths caused by injuries at work (California Healthcare Foundation, 2001), and is ranked between the fourth and sixth leading causes of death (Lazarou et al., 1998). In addition, prescribing errors account for nearly 1 in 20 hospital admissions, this is an admission rate similar to that of cancer.

Prescriptions are the primary means of communicating medication information and instructions between prescribers and pharmacists (Kennedey et al., 2011). A medication prescribing error is defined as "a prescribing decision or prescription writing process that results in an unintentional, significant reduction in the probability of treatment being timely and effective or increase in the risk of harm, when compared with generally accepted practice" (Dean et al., 2000).

It has been estimated by some studies carried out in different US hospitals that prescribing errors occur in 0.4–1.9% of all medication orders written, and cause harm in about 1% of all inpatients (Leasar et al., 1997). In the United Kingdom, the incidence of medication prescribing errors is similar to that of the United States (Barber and Rawlins, 2003).

The most common prescribing errors are: incorrect drug, incorrect dose, allergies, and drug–drug interactions (Agrawal, 2009). Another study concluded that 11.4% of medication prescribing errors are associated with the use of an incorrect drug name, dosage form or abbreviation (Leasar et al., 1997). Incorrect drug medication errors could lead to severe harm to the patient and should attract special attention. The objective of the current study was to explore factors that help pharmacists identify and thus prevent harm from incorrect drug prescribing errors in an ambulatory care setting.

2. Methods

This was a retrospective study in the ambulatory care pharmacies at the King Faisal Specialist Hospital and Research Center (KFSH&RC), including incorrect drug error reports from January 2011 until September 2012. KFSH&RC is a tertiary referral hospital located in Riyadh, Saudi Arabia, with more than 1000 tertiary care beds. The Hospital and Research Centre has a total of 6946 staff members, comprising 63 different nationalities, there are 18 medical departments. The hospital medical staff, including Residents and Fellows, includes about 703 physicians, 54% of whom are Saudi citizens. The Pharmaceutical Care Division is composed of three departments: the Ambulatory Care Pharmacy, the Medical/Critical Care Pharmacy, and the Medication Safety/Clinical Pharmacy Support Services. The Division provides comprehensive, 24-h computerized distribution and dispensing services to both inpatients and outpatients, with a patient-focused and integrated model of pharmaceutical care. It has around 235 personnel, 28 of whom are clinical pharmacists in different clinical practice areas in addition to a quality coordinator and a medication safety officer.

The hospital electronic adverse events reporting system is a voluntary reporting system that was launched in 2007. Medication error reports from the pharmacy are initiated by the pharmacist and reviewed by the quality control department and medication safety officer. The medication variances in this system are divided into six main categories based on the medication use process: purchasing and storing, prescribing, transcribing and order transmission, preparing and dispensing, administering, and monitoring. These categories are subdivided into different medication error types. For example, medication prescribing errors are divided into around 40 different types including incorrect drug, incorrect dose, incorrect frequency, incorrect patient, unauthorized medication prescribing, protocols not followed, omission, etc.

In this study, the reported medication prescribing errors in the KFSH&RC Safety Reporting System were thoroughly reviewed and evaluated by two researchers. Subsequently, the researchers reviewed only incorrect drug prescribing errors to ensure the accuracy of data classification. Factors contributing to the identification of incorrect drug prescribing errors were identified. Descriptive statistics were used to analyze the data (frequency and percentages). Data were analyzed using Microsoft Excel 2010 software. The study was approved by the hospital Office of Research Affairs (ORA).

3. Results

During the period from January 2011 to September 2012, a total of 2073 prescribing errors were reported in the hospital Safety Reporting System. Table 1 lists the most common types of reported medication prescribing errors. Incorrect drug