Medication Errors Affecting the Respiratory Intensive Care Patients: Incidence, Identification, Safety Profile and Practical Solutions

Thesis

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This work is dedicated to

My father, my mother and my brother

Who gave me love, encouragement

and support

throughout my entire life

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LIST OF ABBREVIATIONS

ADE	Adverse drug events
AHRQ	Agency for Healthcare Research and Quality
AIDS	Acquired immune deficiency syndrome
ASHP	American Society of Health-System Pharmacists
BNF	British National Formulary
COPD	Chronic obstructive pulmonary disease
CPOE	Computerized physician order entry
FDA	Food and drug administration
FEV1	Forced expiratory volume at the first second
JCAHO	Joint Commission on Accreditation of Healthcare Organizations
HCFA	The Health Care Financing Administration
HRQL	Health-related quality of life
ICU	Intensive care unit
IHI	Institute for Health care Improvement
IOM	Institute of Medicine
LOS	Length of stay
L.S.D.	Least significant differences
MAR	Medication administration record
MDI	Metered-dose inhaler
NAC	N-acetylcysteine
NCCMERP	National Coordinating Council on Medical Error Reduction and Prevention
NQF	National Quality Forum
NSAIDs	Non-steroidal anti-inflammatory drugs
RICU	Respiratory intensive care unit
SEE	Sentinel Events Evaluation
SUPPORT	Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatment
USP	United States Pharmacopeia

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- **Abstract**

Medication errors are inevitable, yet they can be reduced. They increase length of stay in the hospital, morbidity, mortality and have great economic impact. Besides, the care of the critically ill patients is a quite complex mission that involves science, health-care, economics, ethics, and the art of medicine.

The intensive care unit (ICU) community has proved that patient safety is recognized as a top-priority issue. Therefore, health care institution should develop, implement, and follow a medication error avoidance plan. This culture of safety requires a fundamental change at both the organizational and individual practitioner levels including the physician, the pharmacist and the nurse.

Evidence supports a team approach among physicians, nurses and pharmacists as a successful mean of improving patient safety, quality of care, and health outcomes. The pharmacy profession is being asked to provide leadership in patient safety initiatives as part of a multidisciplinary approach within health care. This can be accomplished by reviewing medication orders, checking dosing accuracy, drug interactions, contraindications and allergies.

Thus, the aim of this study was to detect and evaluate the medication errors encountered in the respiratory intensive care unit. The assessment of the safety in the unit was also a concern in this study. The assessment of the role of the physician, the pharmacist, the nurse and even the patient concerning the safety inside the RICU is a concern. Study recommendationswill provide a guidance to reduce the occurrence of

medication errors. The importance of the culture of safety and proposed methods of its achievement will be emphasized.

Two hundred patients'files were included and reviewed in this study. Number of males was greater than that of females and the age of patients ranged from 18 to 90 years. The number of co-morbidities ranged from one to ten. The length of the stay period inside the ICU ranged from 1 to 62 days with the greater number of the patients discharged to home.

Thefiles were reviewed including prescriptions, medication administration records, nurse kardex, and laboratory data. The medication errors encountered were classified. The USP National Coordinating Council for Medication Error Reporting and Prevention was used. This system developed a standardized categorization for medication errors according to the severity of outcomes.

A total number of 6389 potential and actual errors were detected. The most type of error discovered was omission (70%). The highest percentage of errors was committed by the nurses (52%). The researcher pharmacist discovered the highest percentage of errors (78%). The night shift (8p.m. to 8a.m.) recorded the highest percentage of errors (29%). The errors with the distribution of drug classes according to the general classification of the British National Formulary were assessed where the therapeutic classes most commonly associated with errors were bronchodilators 1502 (21.93 %), anti-secretory drugs and mucosal protectants 922 (13.47 %) and antibacterial drugs 820 (11.9%).

In addition, four questionnaires were prepared. One of them for the physician, one for the pharmacist, one for the nurse, and the last one was for the patient. These questionnaires assessed the implication of the

culture of safety including both the role of each individual alone and the system as a whole.

Answers to questionnaires clarified that the workload of physicians is high and there is no adequate cooperation between hospital departments. Physicians reported that they do not punish nurses when they report the errors they make. Physicians also reported that they rarely prescribe verbally and they ask about patient allergies before prescribing. Physicians think that the unit is not perfectly safe. On the other hand, pharmacists do not have enough patient information, they have a very limited role and there is no application of clinical pharmacy inside the respiratory ICU. There is no data base inside the pharmacy. Pharmacists also do not have access to patients' information. Pharmacists reported that the unit does not repeat its errors.

The nurses' answers displayed an overall good image about their work, their knowledge and their relationships with patients. They reported that they had the required amount of education and training they need to work inside the RICU. However, they lack errors reporting culture.

Patients were satisfied with both nurses' behavior and work. They reported that the nurses are kind to them and they have no fears of being misdiagnosed or that they may experience any kind of error or harm inside the unit. They reported that they feel safe inside the unit.

Therefore, it could be concluded that applying pharmacist active participation inside the unit, encouraging errors reporting, in addition to implementing the culture of safety may help decrease the incidence of errors, length of intensive care stay, morbidity, and mortality outcomes.

Key words: Medication errors, safety, respiratory intensive care unit.

Introduction

❖ Introduction

Health care should be safe, effective, patient-centered, timely efficient and equitable ***(Institute of Medicine, 2001).*** All medications should be "properly and safely secured."***(Joint Commission Accreditation of Healthcare Organizations, 2006).***

Medication errors may occur in hospitals, clinics, outpatient surgery centers, doctors' offices, nursing homes, pharmacies or even at patients' homes.

Medical errors are a general term used to denote all errors that occur within the health care system e.g. equipment failure, diagnostic error, caring procedure, monitoring and medication errors. Medication errors may result in serious patient morbidity and mortality, increased health care costs, and in some cases, loss of confidence in the health care system ***(Bates et al., 1997; and Caesar et al., 2006)***. Due to errors in multiple steps of the process, many studies recommend a systems approach to reduce medication errors including adopting technology, using pharmacists on rounds, standardizing processes, having easy and reliable access to patient information, and implementing methods to improve reporting of errors ***(Taylor et al., 2008).***

Medication errors are the single most common type of medical error in hospitals. Studies have shown that drug errors have consistently been the major cause of iatrogenic illness, prolonged hospitalizations and injury to patients in hospitals***(Fiesta, 1998; and Kaushal et al., 2001).***