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PEDIATRIC MEDICATION SAFETY UND PEDIATRIC EXAMINATION AND ITS ARE CRITICAL ANALYSIS: A CRITICAL ANALYSIS

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Abstract- Pediatric patients taken care of in emergency departments (EDs) are at high risk for drug errors. The Emergency Medical Services for Children initiative and the American Academy of Pediatrics Committee on Pediatric Emergency Medicine organized a multidisciplinary group to facilitate a dialogue on drug protection within the ED. The pediatric emergency care setting is recognized as a high-risk drug error area due to a variety of factors, including medically complicated patients with multiple drugs unfamiliar to emergency department (ED) personnel, lack of common pediatric medication dosage and formulations, weight-based dosage, 6.7 verbal instructions, a hectic atmosphere with frequent interruptions, Furthermore, the vast majority of pediatric patients seeking treatment in EDs are not seen in pediatric hospitals but instead in community hospitals, which can handle a limited number of patients. Reports also detail the problem of pre-hospital drug errors in infants. This article delineates the impact of pediatric medication safety in emergency department in MCD hospitals. To promote the development of distraction-free medication safety zones for medication preparation.

Keywords: Pediatric patients, emergency care, infants, multidisciplinary group, high-risk drug

1. Introduction

Despite a national focus on pediatric safety since the publication of the “To Err is Human” report of the Institute of Medicine (now the National Academy of Medicine) in 1999, medical errors remain a leading cause of morbidity and mortality across the United States. Medication errors are by far the most common type of medical error that occurs in hospitalized patients, and it has been found that the rate of medication errors in pediatric patients is as much as 3 times the rate in adults. Since certain medication failures and adverse drug events (ADEs) are preventable, approaches for improving the safety of medication are an integral component of an overall approach to providing children with quality treatment.

The pediatric emergency care setting is recognized as a high-risk drug error area due to a variety of factors, including medically complicated patients with multiple drugs unfamiliar to emergency department (ED) personnel, lack of common pediatric medication dosage and

formulations[2], weight-based dosage, 6.7 verbal instructions, a hectic atmosphere with frequent interruptions, Furthermore, the vast majority of pediatric patients seeking treatment in EDs are not seen in pediatric hospitals but instead in community hospitals, which can handle a limited number of patients[3]. Reports also detail the problem of prehospital drug errors in infants. A survey of 8 Michigan emergency medical services facilities reported deficiencies of up to one-third of the prescriptions being mistakenly dosed for widely used drugs. Medication error rates reported by single institutions with dedicated pediatric EDs ranged from 10% to 31%, and medication errors accounted for nearly 20% of all incident reports in a pediatric tertiary care center network study, with 13% of medication errors causing patient damage.

Another study's authors examined medication errors in children at 4 rural EDs in northern California and found a 39 percent error rate, with 16 percent of those errors having the potential to cause harm. The following review contributes to the broad subject of drug protection by providing specific incentives, special to pediatric patients in EDs, to promote local action based on clinical expertise and resources.

2. Strategy for Improvement

Through its Committee on Pediatric Emergency Medicine, a multidisciplinary group of experts was assembled by the Emergency Medical Services for Children program and the American Academy of Pediatrics (AOP), to address issues related to the protection of pediatric medications in an emergency environment. The panel included emergency care professionals, nurses and pharmacists, members of the electronic health record industry, leaders of pediatric safety associations, hospital accreditation groups and children's parents who suffered from ADEs.

The panel outlined numerous opportunities for improvement, including raising awareness of risks to emergency care providers, trainees, children and their families; developing policies and processes to enhance the safety of pediatric medicines; and implementing best practices to reduce pediatric ADEs. Specific approaches addressed by the panel are identified, as are recent developments in improving the safety of pediatric medicines.

2.1 Decreasing Pediatric Medication Prescribing Errors in the ED

Computerized Physician Order Entry

The majority of pediatric medication errors have historically been associated with the ordering phase of the medication process. Specific risks associated with pediatric weight-based dosing include not using the right weight, conducting pound-based drug measurements instead of the accepted kilogram norm and making incorrect measurements, including tenfold dosage

errors[4]. Childhood obesity introduces additional opportunity for error in dosing. In addition to the lack of science to direct the dosage of medication in patients with obesity, regular under dosage is recorded, and the resuscitation tools currently available are generally imprecise. In addition, drug tracking or double-checking opportunities are minimal in the ED setting, and measurements are done several times in the clinical area without feedback from a pharmacist.

Implementation of electronically controlled computerized physician order entry (CPOE) and clinical decision support (CDS) has minimized many of these mistakes, as most CPOE systems eliminate the need for basic dosage measurement. Nevertheless, CPOE programs did not remove mistakes in the drug absolutely. Commercial or independently developed CPOE systems may fail to address critical unique demands for pediatric dosing.

For weight gaining, kilogram-only scales are recommended, but conversion to pounds by either the operator or electronic health record may introduce the system with the possibility of error. Moreover, CDS may be overridden by providers, despite proven success in reducing errors. Prescribers also choose to ignore or override CDS prescribing warnings, with override levels estimated to be as high as 96 percent. Allowing free text justification to override warnings for non-formular drugs can result in errors. Developing an override algorithm can help to lower user variability.

As CPOE use increases, one can expect the prevention of millions of medication errors. For EDs that do not use CPOE, it has been shown that preprinted prescription order forms greatly minimize medication errors in a variety of settings and act as a low cost replacement for CPOE.

Standardized Formulary

The Institute of Medicine (now National Academy of Medicine) advises the creation of recommendations for the dosage of pharmaceutical products, preparations, labeling and techniques of administration for the setting of pediatric emergency care. Sadly, there are currently no widely accepted, pediatric-specific dose recommendations and limits requirements, and dose instructions and warnings found in CPOE are generally given by third-party providers who provide outlets for both children's hospitals and general hospitals. Developing a standard pediatric type, independent of an adult-focused method, will minimize chances of error by specifying specific concentrations and standard dosage of high-risk and commonly used medicines such as resuscitation medicines, vasoactive infusions, opioids, and antibiotics, as well as look-alike and sound-alike medicines. A uniform form would require standardized training for emergency care providers during initial training and continuing medical education, providing a consistent measure of provider skills. This form of reform has been successfully adopted by at least 1 major hospital organization. The American Society of

Health System Pharmacists is also working with the Food and Drug Administration to develop and implement national standardized concentrations for both intravenous and oral liquid medicines.

3. ED Pharmacists

Many medicines are actually prepared and dispensed in the ED without pharmacist screening or planning because many EDs lack sufficient pharmacist coverage on site[6]. 68 percent reported at least 8 hours of ED coverage on weekdays in a pharmacist survey, but fewer than half of EDs see this support on weekends, with a drastic reduction in coverage over night and morning hours. The American College of Emergency Physicists (ACEP) supports the integration of pharmacists into the ED team, specifically recognizing the pediatric population as a high-risk group that might benefit from the presence of pharmacists.

The Association of Emergency Nurses (ENA) promotes the position of emergency nurse as well as pharmacy workers to efficiently complete the best possible history of medication and eliminate inconsistencies in the prescription. The American Society of Health-System Pharmacists recommends that ED pharmacists may help verify and prepare high-risk medicines, be available to prepare and double-check the dosage of medicines during resuscitation, and provide valuable feedback in the reconciliation of medicines, especially for medically complicated children whose medicines and dosages might be unknown to ED staff and who are without a medicine

Medically complex patients typify the drug reconciliation difficulty with an error rate of 21 per cent in a tertiary care facility. No 1 source from the parent, pharmacy, and primary provider community was available in this analysis, and was suitably responsive or precise in completing drug reconciliation. For admitted pediatric patients, pharmacist-managed reconciliation has had a positive impact and can translate into an emergency setting. Also, ED pharmacists can help track ADEs, provide prescription information and provide physicians and patients and/or families with information about medication ingestions. Dedicated pharmacists can be integrated by a variety of methods, such as hiring dedicated pharmacy staff for the ED, having these staff available immediately upon consultation, or having a central pharmacist remotely reviewing medication orders.

While more work is required on the possible outcomes of drug safety and return on investment when a pharmacist is put in the ED, existing experience suggests changes in drug safety when there is a pharmacist present.

4. Training in Pediatric Medication Safety

Dedicated training in the protection of pediatric drugs is extremely variable in the curricula of the medical, nursing and pharmacy training programs. Although national standards promote prehospital staff training with relevant pediatric content and safety and error-reduction training, an error rate for vital medicines for pediatric patients remains nearly 35 per cent. The pediatric and emergency medicine internship curricula and the pediatric emergency medicine fellowship programs do not identify basic criteria for pediatric medicine safety training at the graduate medical education level.

The same applies to pharmacy programmes. Though pharmacy schools include pediatric topics in their core curricula, advocates for pediatric safety believe there is an opportunity for enhanced and improved training. Pediatric emergency care experts from the multidisciplinary panel are suggesting the creation of a pediatric drug protection program that could be provided to all child caregivers in emergency settings.

A typical curriculum can include material such as common infant medication errors, system-improvement methods for preventing or removing errors, and the effects of pediatric patient developmental differences. Demonstration of competence under this program is 1 way by which institutions can reduce the risk of medication errors.

5. Conclusion : Principles of Pediatric Pediatric Safety: Reducing Harm due to Medical Care

Pediatric safety is characterized as the free access to health care, such as harm or death due to adverse drug events, patient misidentification and infections acquired in the health care-related or health-related areas.1 While pediatric safety is but one of the sechs fields in which medicine quality is characterized as being of the highest importance by the Institute, it certainly is one of the highest priority domains. Injury prevention measures such as the use of car seats and helmets can incorrectly be perceived as the word ‘pediatric protection.’ However pediatricians are able to advances the idea that child-proof pediatric protection involves the avoidance of child accidents caused directly by the healthcare system.

Pediatric protection has been a central concern in health systems over the past 10 years. Increased science, norm, joint initiatives, education and pediatric protection measures have increased significantly since the 1999 IOM report To Erre Is Human. In 2001 the US Academy of Pediatrics (AAP) published the declaration “Principles of Pediatric Security in Pediatrics,” after recognizing the need to regularly direct and recognizepediatric patient security problems, and it published the declaration “Prevention of Drug Errors in Pediatric Inpatient Environment” in 2003. In this statement, the “Pediatric Safety Principles: Reducing Harm Because Medical

Treatment," we recognize the problems and procedures that exist to mitigate pediatric medical mistakes and increase the quality of care. This statement focuses on three main issues:

1. The significance of pediatric safety;
2. The science behind the culture of safety; and
3. Pediatric safety strategies.

5.1 Special Considerations for Children

In relation to adults, medical errors and patient damage vary in many respects. First, kids are higher risk of drug error than adults due to the growth of kids, demographics, parent-dependence and other medical care providers, and various epidemiologies of medical conditions. Medicinal errors are the main explanation for avoidable medical mistakes in children. Second, CPOE systems that are built for adults have no efficiency in the reduction of pediatric drug errors. Efforts to remove bloodstream infections linked to catheters in adults often do not have the same effect on infants. In addition to determining the best methods for mitigating these preventable harms in infants, pediatric patient safety efforts must be studied. There are multifactorial explanations for the particular characteristics of issues with patient safety and child solutions. Woods all have identified these factors as three main areas:

1. Physical characteristics;
2. Developmental issues; and
3. Minor legal status issues.

Layered onto these distinguishing characteristics is a general patient-safety approach that involves 3 main strategies:

1. Understanding the epidemiology of errors and having sources of error identification;
2. Understanding the science behind improvement, including the safety culture; and
3. Having a source of core patient-safety solutions.

Each of these overarching strategies should be incorporated into pediatric patient safety risk assessment and solution development, and attention should be paid to each of the unique domains of pediatric patient-safety risks.

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