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Editorial

Medications and safety

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Introduction

We take medications everyday prescribed or from over the counter. Are they helping us for the condition we are taking them for and are they safe? We all question how safe our mediation regimens are. There is a substantial increase in morbidity and mortality throughout the world due to Medication errors and they are a leading cause of injury and avoidable harm.

Medical providers globally continue to face the dilemma as to how to provide safe and effective medications. Another relevant factor to consider is cost. As estimated by the World Health Organization, the annual cost associated with medication errors has been about $42 billion globally. In the United States alone, these errors result in at least one death every day and injure about 1.3 million people annually.[1,2] It was reported that patients in low-income countries in the world lose twice as many disability-adjusted life-years due to medication-related harm than those in high-income countries[1]. One study in 2018, reported that in England, there were 237 million medication errors annually. Fortunately, about half of them were administration errors with minimal or no potential clinical harm. There were an estimated 50 million prescribed and 16 million monitoring errors of which 52% and over 90%, respectively, had the potential to cause moderate or severe harm.[3]

Safety

Patient safety is a serious concern for public health. In the developed countries as many as one in 10 patients is harmed while receiving hospital care. A systematic review was published to investigate the epidemiology in 2012.[4] It is the responsibility of patients and health care professionals to play a role in ensuring medication safety.

The World Health Organization's (WHO) has launched the Third Global Patient Safety Challenge: Medication without Harm.[1] This initiative aims to reduce serious avoidable medication-related harm by 50% in the next 5 years globally. It was formally launched at the Second Global Ministerial Patient Safety Summit in Bonn, Germany on 29 March 2017.

The third WHO Global Patient Safety Challenge: *Medication without Harm* will propose solutions to address many of the obstacles the world faces today to ensure the safety of medication practices. WHO's goal is to achieve widespread engagement and commitment of WHO Member States and professional bodies around the world for reducing the harm associated with medications.

The four domains in the strategic framework of the Global Patient Safety Challenge are 1) Patients and the Public, 2) Health care professionals, 3) Medicines and 4) Systems and Practices of medication. Each domain addresses these in four subdomains. In the Patients and the public domain, they are a) Public awareness and medication literacy, b) Patient engagement, c) reporting by patients and d) Involvement of patient organizations. The subdomains for Health care professionals are a). Education and training, b). Communication and teamwork, c). Capability at point of care and d). Incident reporting and learning. For the third domain Medicines, they are a) Product quality and safety, b) naming, labeling and packaging, c) Logistics, storage and disposal and d) right product at point of care. Lastly for the domain Systems and Practices of medication the subdomains are a) Leadership and governance, b) Prescribing preparation and dispensing, c) Administration and patient and monitoring and d) Monitoring and evaluation.

There are three key action areas in each domain, and they are 1) polypharmacy, 2) high-risk situations and 3) transitions of care.

Let us address these critical areas

Medication safety and poly pharmacy

Poly pharmacy is defined as the concurrent use of multiple medications by a patient. Another definition is the simultaneous use of multiple drugs by a single patient, for one or more conditions. There is an increase in the prevalence of poly pharmacy worldwide. Poly pharmacy results in negative health outcomes, including falls, frailty, and mortality.[5,6]

Poly pharmacy is most common in older adults, affecting about 40% living in their own homes. About 21% of adults with intellectual disability are also exposed to poly pharmacy. Since poly pharmacy is a result of having several underlying medical conditions, it is more common in older adults. It is attributed to three factors: demographic factors, health factors, and access to healthcare. There is an increase in the available medications and over the counter drugs more recently to add to this problem.

A third of individuals between ages 62 and 85 take at least five prescription drugs every day. The prevalence of poly pharmacy in the US is 39% in community-dwelling older adults and they were exposed to more than five prescription drugs.[6] This is a major problem as people over 65 years and older constitute 13% of the US population and by the year 2040, this number will increase to 25%. In a study conducted among nursing home residents in eight European countries, 74% were found to be exposed to polypharmacy and 24% to excessive poly pharmacy. The prevalence of poly pharmacy is typically higher[7] in the nursing home setting in Sweden.

In older adults, the changes in physiology and drug metabolism are important to understand for each prescribed medication. There are age-related physiological changes and body composition, pharmacokinetics (absorption, distribution, metabolism and excretion) and pharmacodynamics (physiologic effects of the medication) and they all play a role in the way older adults handle various medications. They are more sensitive to medications and the effects of the same dose of a medication taken by an older adult are different as the drug is eliminated slowly due to age related changes in kidneys and liver and the effects may last longer.

Even the most common drug such as aspirin can have serious consequences. For years, it has been prescribed for healthy older adults to prevent heart attacks. A recent study in the New England Journal of Medicine showed that in 19,000 older adults age 70 and above, a daily aspirin dose didn't reduce cardiovascular disease risks but increased rates of gastrointestinal bleeding by 38%.[8]

The American College of Cardiology and the American Heart Association and the American Geriatrics Society (AGS) in a recent update of its Beers Criteria advice against routine use of aspirin in adults over 70 years of age without heart disease.

The American Geriatrics Society Beers Criteria® (AGS Beers Criteria®) for Potentially Inappropriate Medication (PIM) use in Older Adults[9] is widely used by clinicians, educators, researchers, healthcare administrators, and regulators. Practicing clinicians are the primary target audience for the AGS Beers Criteria. The criteria are intended to be used in all the care settings; inpatient acute, institutionalized, and ambulatory settings except in Palliative care and Hospice settings. The AGS Beers Criteria can increase awareness of poly pharmacy and assist in decision making when choosing drugs to avoid for older adults. It is a necessary and useful clinical, as well as an educational tool at the bedside, and a public health tool to improve medication safety in older adults. The use of potentially inappropriate drugs and underuse of drugs is also frequent among older adults.

Medication safety in high-risk situations

Cardiopulmonary arrest and code-related situations are good examples of high- risk situations and medication safety in these situations cannot be overemphasized.[10]

Errors in prescribing account for 10.7% to 46% of code-related medication errors.[11,12] Although Verbal orders are discouraged by many organizations, including the Joint Commission and the Institute for Safe Medication Practices (ISMP), these orders are a necessity during code situations.[13]

Errors during these situations can occur from a combination of stress related conditions, knowledge-deficit, incomplete orders, and inaccurate interpretation of verbal orders. During emergencies, clinicians are encouraged to read back verbal medication orders and to clarify incomplete orders.[14] Stating the dose and name of the medication either before administering a medication or while handing the medication to another code team member for administration should be encouraged as a double-check process to ensure that the entire code team is aware of the medications used and that no misinterpretations have occurred.[10]

High-risk situations are associated with significant harm due to unsafe medication errors or medication practices. The factors contributing to high-risk situations are medications, particularly high-risk (high-alert) medications, provider/ patient factors, and systems factors (work environment). These factors may result in medication errors or practices. This report describes how sustainable strategies can be developed and implemented to reduce the risk of harm from medication errors in high-risk situations.

Medication safety in transitions of care

An estimated 60% of all medication errors occur during transitions of care.[15] Lack of effective communication leads to majority of adverse effects due to medication errors during transitions of care from one setting to another. Majority of serious medical errors involve miscommunication during hand-off between medical providers. Every patient that goes through transitions of care e.g. admission to or discharge from hospital to home, Rehabilitation units or sub acute or long-term care facilities experiences medication errors or discrepancies.

The Joint Commission Center for Transforming Healthcare has been emphasizing the importance of improving transitions of care by concentrating on hand-off communications.[16] WHO's message to countries is to reduce medication related harm during transitions early with prioritizing and creating sustainable actions.

Numerous factors influence medication errors making it difficult to achieve safety,[17,18] There are factors associated with health care professionals, patients, work environment, medicines, tasks, computerized information systems and Primary-secondary care interface.

The Key steps for safeguarding medication safety are appropriate prescribing and risk assessment. Medication review, dispensing, preparation and administration, communication and patient medication reconciliation and engagement at care transitions are the key ingredients of the best practice to ensure safety.

Engaging patients in conversations aimed at shared decision-making and giving practitioners feedback about their performance relative to peers appear to be useful in reducing the overuse of medications.[19, 20] Patient safety organizations (PSOs) are the external experts that collect and review patient safety information and they are engaged in reducing medication errors and improving medication safety. The Patient Safety and Quality Improvement Act of 2005 in the US enables the reporting, analysis, and discussion of safety events between providers and PSOs by making the information privileged and confidential.

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Conflict of interest

The authors declare no conflicts of interest.

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