

Evaluation Of Pharmaceutical Staff About Storage of High Alert Medications (HAMs)

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Abstract. The patient safety challenge is medication without harm. High alert medications (HAMs) are medications that a bear heightened risk of causing significant patient harm when these medications are used in error. High Alert Medications must be stored separately from other drug stores and given special labels. The thoroughness of professional pharmaceutical staff can reduce the risk of error. The purpose of this study was to determine the evaluation of pharmacists regarding High Alert Medication Storage. This type of research is descriptive qualitative research. The results showed that the storage of High Alert medications that had been carried out by pharmaceutical staff obtained results according to regulations and standard operating procedures of 100% in the storage category of high-alert electrolyte drugs in pharmaceutical warehouses, pharmacies, inpatient rooms, and emergency departments. whereas storage for the high-risk drug category and storage for the LASA drug category did not reach 100%.

Keywords: [High Alert Medications, Storage.]

INTRODUCTION

Patient safety is a system that makes safer patient care, including risk assessment, identification, and management of patient risk, incident reporting and analysis, and follow-up ways to reduce the occurrence of risks and prevent injuries resulting from a medical error (Permenkes, 2017). Patient safety is one of the most important components of health care coverage must mean extending safe care, as unsafe care increase costs reduces efficiency, and directly compromises health outcomes and patient perceptions (WHO, 2019).

Medications to watch out for (HAMs) are drugs that often cause serious errors (sentinel events), medications high risk of causing unwanted impacts (adverse outcome) are like drugs that look alike and sound alike (Name Visual Medicine and Similar Speech/NORUM, or Look Alike Sound Alike/LASA (Depkes RI, 2016). Too many medications being prescribed is one of the factors that can lead to a risk of medication error (Rahmawaty & Pratiwi, 2022).

The percentage of suitability for storing HAMs in several hospitals is still low, for example, the storage of HAMS at a hospital in Banjarmasin has only reached 42.62% which is following the Standard Operating Procedure (SOP). Storage of Hams in cytostatic drugs is as much as 26.71% according to SOP (Diana, 2016), while in 2016 HAMs storage at Jakarta Hospital is still 85% (Sakinah *et al*, 2017).

High Alert medications (HAMs) are drugs that have a high risk of harming patient safety if not used properly (Nurul, 2021). Impact The consequences of dispensing errors for High Alert medication can harm patients and reduce the level of public trust in health services in hospitals (Permenkes RI, 2016). Preventable medication errors are the strategy for the safe use of HAMs, These are Patients, Healthcare professionals, Medicines, and Systems of medication according to Guideline on Safe Use of HAMs (Ministry of Health Malaysia, 2020).

Using medicine safely can reduce the risk of errors. This includes strategies such as standardizing product ordering, storage, preparation, and administration; limiting access to high-alert alert medications; using auxiliary labels; or independent double checks when necessary (ISMP, 2018). According to Permenkes RI (2016) concerning Service Standards at the hospital, it was explained that high alert drugs must be stored separately from storage of other drugs and given special labeling. High Alert Medication Medication (HAM) poses a higher risk and can cause incidents when not handled properly. Labeling is the first step to identifying High Alert Medications (HAMs) (Qiyam, 2016).

High Alert medications are included in the category of high-risk drugs that cause significant patient harm when used incorrectly (National Guidelines on High Alert Medications, 2021). Significant hazard risks may include all formulations both oral and parenteral (Basic Medication Safety, 2018). The 2018 National Medication Safety Committee (NMSC) mentions drugs such as anticoagulants, opioids,

cytotoxics, and chemotherapeutic agents are included in high-alert medications (HAMs). All forms of insulin, subcutaneous and IV, are considered a class of high-alert medications (ISMP, 2018).

The role of the pharmacist in handling high alert medications is to improve the storage process, starting from providing special marking/labeling, separating storage of LASA drugs and special storage for high concentrate electrolytes, participating in the medical team to provide information on high alert medications, making analyzes, monitoring effects side and identify errors (Kemenkes RI, 2014).

METHODS

This research is a qualitative descriptive study. The study was conducted at Pati City X General Hospital, Indonesia. Data collection was carried out prospectively in 2022. The research data were obtained from direct observation using checklists, interviews, and documentation that had been approved by the research subjects. The research subjects were informants from all pharmaceutical staff. Data collection technique using purposive sampling, namely the technique of selecting informants as research subjects determined directly with predetermined criteria (Sugiono, 2016). The sample inclusion criteria in this study were drugs included in the list of high-alert medications at the X General Hospital Pharmacy Installation in Pati.

Analysis of the data used by analyzing and describing the data obtained. This data includes High Alert Medication storage data in emergency departments, inpatient rooms, pharmacy warehouses, and pharmacies and then compared to standard operating procedures in the hospital. getting the results then analyzed using a checklist sheet with scoring 1 (one) if it matches the SOP and is given a score of 0 (zero) if it does not match the SOP for ham storage. To see whether according to the standard or not by dividing the score obtained by the overall score and then multiplying by 100%.

RESULTS AND DISCUSSION

There are 3 categories of high-alert medications at the Pati X General Hospital Pharmacy Installation, The research result can be seen in the table below:

Table 1. Distribution Profile Category HAMs.

No.	Category HAMs	Drugs	Type	Storage
1	High-Risk Drug	Insulin Aspartate	Insulin	100%
		Insulin Garglin		100%
		Fondaparinux	Anti Thrombotic	87%
		Heparin		87%
		Warfarin		87%
		Fentanyl	Narcotic Analgesic	87%
		Morphin		100%
		Codein		100%
		Bupivacaine Inj	Anesthetic Agent	87%
		Ketamine Inj		87%
		Lidocaine Inj		87%
		Oxytocyn	Hormone	100%
		Alprazolam	Psychotropic	87%
		Diazepam		87%
		Clobazam		100%
		Lopamidol	Radiocontrastive agents	100%

Source: Processed primary data (2022)

No	Category HAMs	Drugs	Type	Storage
2	LASA/NORUM	Ceftriaxon-Cefotaxime	Look A Like	89%
		Amoxan-Analsik		100%
		Gastridin Inj-Invomit Inj		100%
		Levocin-Trodazol inf		100%
		Candesartan 8, 16 mg		100%
		Episan -Epexon Syrup		89%
		Ciprofloxacin- Levofloxacin-Ofloxacin	Sound A Like	100%
		Azitromicin-Eritromicin		100%
		Chloramphenicol- Thiamphenicol		100%
		Nifedipine-Nimodipine		100%
		Dobutamine-Dopamine		100%
		Ephedrin-Epinefrin		89%
3	High Concentrate Electrolyte	Potassium Chloride		100%
		Sodium Chloride		100%
		Magnesium Sulfate 20%		100%
		Magnesium Sulfate 40%		100%
		Natrium Bikarbonat		100%
		Mannitol 20%		100%
		Calcium Gluconas		100%

Source: Processed primary data (2022)

The results of interviews with pharmaceutical staff by providing a checklist sheet obtained the result that the storage results ranged from 87-100%. Storage of high-risk medication based on Table 1 in X General Hospitals Pati is stored in special rooms or cabinets, using high alert labels. Storage methods are carried out based on therapeutic class, dosage forms, and types of pharmaceutical preparations, medical devices, and consumable medical materials and are arranged alphabetically by applying the principles of First Expired First Out (FEFO) and First In First Out (FIFO).

Temperature storing of high-risk drugs in this study based on Table 1 has been saved at a temperature of 2-8° C in the chiller and in the freezer it is stored at a temperature of -25° C to -15° C. High-risk drug errors were found most likely to occur in the reconstitution step. Apart from the storage factor preparing and checking injections needed for reconstitution may reduce the overall error rate significantly (McDowell *et al.*, 2010). High drug risk for example insulin should be stored in a fridge at 2-8 degrees Celsius (Department of Health Australia, 2020).

This study place for storage of high alert medication in the LASA category in a place where the difference is clear, separately or among other drug items, Stored in a medicine storage box, and put a yellow sticker with LASA written on it. Storage temperature at room temperature 15-30°C and at refrigerator temperature 2-8°C. separating two drugs that look alike/sound the same in different places ensures labeling is used to reduce medication errors (Department of Health Australia, 2020).

The results of High Concentrate Electrolyte storage were found to be 100% appropriate in this study because High alert drug storage for the High Concentrate Electrolyte category had been stored in

separate boxes/containers for each drug. Storage with a High Alert Label for all drugs in boxes/containers with a storage temperature of 15-30°C.

It is recommended that when a high-concentrate electrolyte is kept in an approved clinical area, it is kept separate from other products and labeled in a clear way to indicate that this medication is a 'high concentrate electrolyte' to prevent selection error (Department of Health Australia, 2020). Double-check when taking the medicine in place and when handing it over to the patient must be done. monitoring of medicines should be the subject and audit for health staff must be professionals given medication safety as part of the priority (Onatade & Quaye, 2018).

Table 2. Drug Storage Based Category HAMs.

No.	Category HAMs	Pharmaceutical Warehouses	Pharmacies	Inpatient Rooms	Emergency Departments
1	High-Risk Drug	95%	90%	100%	100%
2	LASA/NORUM	99%	89%	100%	100%
3	High Concentrate Electrolyte	100%	100%	100%	100%

Source: Processed primary data (2022)

High alert medication at the X Pati General Hospital Installation, the results of the percentage of conformity of high alert drug storage with SPO showed that the most suitable storage was in the high concentrate electrolyte category as much as 100% in pharmacy warehouses, 100% in pharmacies, 100% inpatients and 100% in Emergency installation. This is because there are only a few drugs in the high-concentrate electrolyte category, making it easier for pharmaceutical staff to monitor and store and label drugs. This is to Guideline on Safe Use of HAMs, Ministry of Health Malaysia (2020) that good storage is clear concentration and clear information on container/syringe label.

Meanwhile, for the high-risk category, storage in pharmacy warehouses yielded 95%, 90% in pharmacies, and 100% in emergency and inpatient installations, the lowest percentage was storage in pharmacies of 90% due to stock labeling cards that were missed by pharmaceutical staff because in this category many drugs are classified as fast moving so that in storage there is an accumulation of drugs. Drug stock must be on time. Stock audits are conducted promptly to ensure compliance with the high-alert drug storage policy (Kapadia *et al.*, 2017).

Storage of LASA category drugs in pharmacy warehouses yielded 99% results, 89% in pharmacies, and 100% emergency and inpatient installations, the lowest percentage was found in drug storage at pharmacies of 89%, this was due to storage of the LASA category adjacent to other drugs and there were still Drugs that have not been labeled LASA on their storage containers.

There is still storage of HAMs in this category that are not following the Standard Procedures Operating (SPO) (2018) at RSU X Pati. This can potentially lead to an error in taking the drug so there is a risk of an error in distributing the drug to the patient. This is following research by Hidayati *et al.* (2021) that storage in the LASA category is low because it only has storage places for similar drugs that are placed close together, not in alphabetical order because it does not have drug containers.

To avoid errors with Look-Alike, sound-alike, or read-alike appearance against any other drug available in the inventory, use recommended techniques for proper differentiation e.g. tall-man lettering, bold labeling of bins/shelves, storing apart, use of brand names as a reference and use of auxiliary/colored labels, Each facility should identify possible Look-Alike and Sound-Alike drugs and preventive actions must be taken to avoid mix-ups and accidental wrong drug administration (Drug Regulatory Authority of Pakistan, 2020)

The developed strategies for prevention the high alert medication reduce the high alert Medication errors. The surveillance of the high alert medication error rate should be further monitored and strategies to be continuously monitored for its effectiveness (Kapadia *et al.*, 2017). Medication-related harm is harm caused to a patient due to failure in any of the various steps of the medication use process (WHO, 2019).

As a result of this study, pharmaceutical staff should be made aware that there are some drugs with

two brands that are not bioequivalent, and check the correct dosage with the prescription to ensure that the correct dose is given to the patient. This is following the Drug Regulatory Authority of Pakistan (2020) that reducing the risk of errors in HAMs storage is to ensure all storage areas have therapeutic guidelines in the form of protocols or SOPs. Restricting the supply of HAMs drugs to certain areas of use. Do a double-check and Ensure all clinical staff has the qualifications and skills appropriate.

CONCLUSION

The storage of High Alert medications that had been carried out by pharmaceutical staff obtained results according to regulations and standard operating procedures of 100% in the storage category of high-alert electrolyte drugs in pharmaceutical warehouses, pharmacies, inpatient rooms, and emergency departments. whereas storage for the high-risk drug category and storage for the LASA drug category did not reach 100%.

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