

# Retrospective Analysis of Look-alike and Sound-alike Drug Incidents in a Tertiary Care Hospital

Priti P. Dhande<sup>1,\*</sup>, Akshay V. Mule<sup>2</sup>, Akshay P. Chaudhari<sup>2</sup>

<sup>1</sup>Professor in Pharmacology, Bharati Vidyapeeth (DTU) Medical College, Pune-Satara Road, Pune, Maharashtra, INDIA.

<sup>2</sup>Clinical Pharmacist, Bharati Hospital and Research Centre, Pune-Satara Road, Pune, Maharashtra, INDIA.

## ABSTRACT

**Background:** Drug names or their appearances are sometimes confusing to the healthcare professionals. These look-alike and sound-alike drugs have the risk of being wrongly used in patients leading to medication errors. Lists of such drugs are available from authorized sources to refer and implement cautions while using them for preventing harm to patients. However, there is always a chance of more possibilities of drugs which can be included in LASA category based on the different brands of drugs available in each country. **Objectives:** This study was planned to search out LASA drug related errors in a tertiary care hospital in Western India. **Materials and Methods:** Medication errors reported by Clinical Pharmacists for a duration of Feb 2017 to Feb 2020 were studied to list out LASA drugs related errors and these were then evaluated. Preventive strategies were developed to avoid similar errors in future in the study setup. **Results:** Out of total 1311 errors reported during the study duration of 3 years, 35 (2.67%) were LASA drug incidences. Majority of these errors were dispensing errors and of "Near miss" category 74.28% and most (24) of the errors were due to phonetically sound-alike drugs (68.57%). Dispensing errors (16) were most commonly associated with these LASA drug incidences followed by computer indenting errors (08). **Conclusion:** LASA drug incidences amounted to a small proportion of total medication errors but have to be considered seriously as they can be harmful to the patient if not identified on time.

**Key words:** Medication errors, Look-alike, Sound-alike, Dispensing, Drug administration.

## INTRODUCTION

One drug may be produced by different pharmaceutical companies which give it a brand name and thousands of such drugs are known by their brand names as well as pharmacological names. Remembering a vast list of drug names is always a tough task for the prescribers. Adding to this problem, is the load of recollecting the correct spellings of these drugs.

Drug names are many times similar in spelling and / or in phonetics; categorized as sound-alike drugs. Others look same in their formulations or packages called as look-alike drugs. These are the category of medications which may confuse the healthcare professionals' right from the physician to the nurse as well as the pharmacist, to be mistaken for another drug (similar looking or spelling) instead of the correct one. Collectively they can be

categorized as Look-alike and Sound-alike (LASA) medications.<sup>1</sup> There are higher chances of erroneous patient care at all levels with the use of these LASA medications if the healthcare professionals are not aware of this concept.

WHO, Joint National Commission<sup>2</sup> and Institute of safe medication practices<sup>3</sup> have listed such LASA medications for reference and suggested measures to implement in healthcare organizations so that LASA related medication errors can be curbed down and harm to the patients is prevented. The list available from these sources cannot be always complete because of the number of drugs produced or marketed in different countries by a variety of names and addition of newer drugs to this list for clinical use every year.

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Address for

correspondence:

Dr. Priti P Dhande,

Professor in Pharmacology,  
Bharati Vidyapeeth (DTU) Medical  
College, Pune-Satara Road, Pune  
411007, Maharashtra, INDIA.

Phone no: +91 9922426840

Email id: pritidhande76@gmail.  
com



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This study was planned to perform a retrospective analysis to find out new pairs of such drugs which have led to LASA drug incidences so that these drug names could be added to the LASA list for preventive measures.

## MATERIALS AND METHODS

This was a retrospective observational study conducted to scrutinize the medication errors reported in a tertiary care hospital to find out Look-alike and Sound-alike (LASA) drug related incidences. The study site was a NABH accredited health care organization where a separate Clinical Pharmacy and Pharmacovigilance department was established for management of medication. In-charge Pharmacologist and trained Clinical pharmacists were responsible for supervising, assessing, guiding and training other healthcare professionals on medication management. During their daily rounds in the wards, clinical pharmacists collected medication errors and reported them (using a medication error reporting form) as incidents for analysis and development of preventive measures. Even nursing staff was trained to report such errors.

In this study, we have screened medication error incidences reported from February 2017 to February 2020 from the study site. Incident reports associated with LASA drugs were studied in detail for the drugs involved, incident type (Near miss, no harm, harm or sentinel), category of medication error (prescription, transcription, indent, dispensing, administration, storage) and its reason. After performing root-cause analysis, preventive strategies were developed to avoid similar medication errors due to LASA drugs in the future.

### Statistical analysis

Data were entered in Microsoft Excel and results are expressed in percentages.

## RESULTS

During the study duration of 36 months (Feb 2017 to Feb 2020), total 1311 medication errors were reported. Out of these medication errors, LASA drug incidences were found to be 35 in number which accounts to 2.67% of the total medication errors. Injectable formulations were most involved i.e. in 23 LASA incidences (64.71%) out of the 35 reported errors.

Figure 1 shows that majority of the errors found in this study were of “Near miss” type (74.28%), followed by “No harm” (20%). Only 2 incidents were classified into “Harm” type of incident as additional clinical monitoring

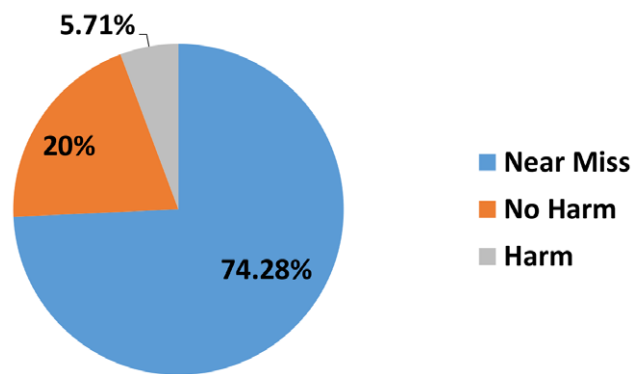


Figure 1: Incident Type LASA errors found in the study.

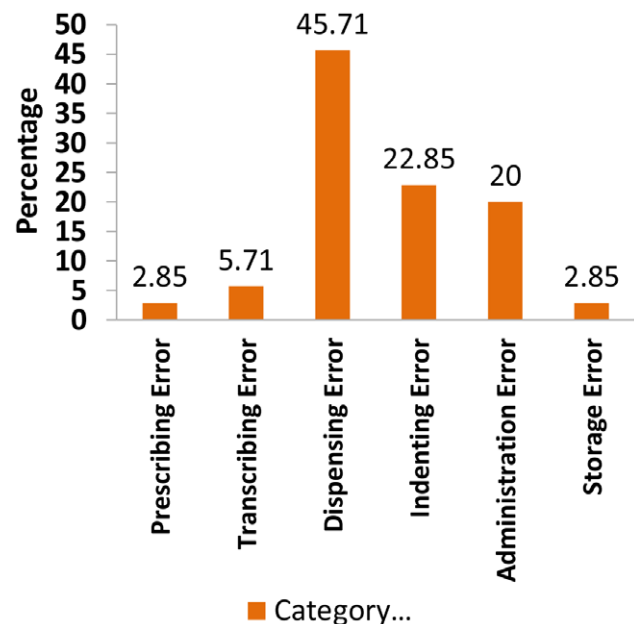


Figure 2: Category of LASA errors reported during study period.

was needed in the patients involved with these errors.

Figure 2 depicts the category of medication errors found in the present study where dispensing errors were found to be maximum i.e. 16 (45.71%) in number out of the total 35 LASA drug related errors. Other such errors were computer indenting errors (08) for ordering medications for patients, drug administration errors (07) and transcription errors (02). Only 1 error was due to erroneous prescription and 1 due to improper storage.

Table 1 depicts that most (24) of the errors found in the study were due to phonetically sound-alike drugs (68.57%) while 22.85% were attributed to appearance wise look-alike medication containers or packets. 1 pair of medication (0.9% Normal Saline and 3% Normal Saline) which caused a computer indent error thrice was due to the fact that these drug names appeared successively in the software list and one was mistaken for the other for selection to be ordered from Pharmacy.

**Table 1: Examples of LASA drug incidences found in the study.**

Drug characteristic	LASA drug errors n (%)	Examples found common to ISMP and FDA List	Some Additional Examples found in the study
<b>Phonetically sound-alike drugs</b>	<b>24 (68.57%)</b>	1. Vincristine - Vinblastine 2. Dopamine - Dobutamine	1. Heparin - Hermin 2. Polymyxin - Polybion 3. Gutron (Midodrine)- Glutaup (Glutathione) 4. Adrenaline -Nor-adrenaline 5. Naprosyn (Naproxen) – Nefrosave (Taurine and Acetylcysteine) 6. Azithromycin – Azathioprin 7. Doxofylline - Pentoxifylline
<b>Appearance of drug formulations or drug containers or packaging look-alike</b>	<b>08 (22.85%)</b>	Not taken into consideration	1. Infusion bottle of 0.9% Normal saline 100ml - Infusion bottle of Metronidazole 100ml - Infusion bottle of Mannitol 100ml- Infusion bottle of 25% Dextrose100ml 2. Nitroderm patch (Nitroglycerine) – Nicoderm patch (Nicotine) 3. Inj.Doxorubicin vial – Inj.Cisplatin vial 4. Inj.Magnesium sulfate ampoule – Inj.Ondansetron ampoule 5. Tab.Polaramine 2mg (Dexchlorpheniramine) – Tab. Pacitane 2mg (Trihexyphenydy) Cut strips

## DISCUSSION

Look-alike and sound-alike drugs are special category drugs to be handled with care by healthcare professionals as any error with these may prove to be potentially harmful to the patients. Recognising such drugs in every hospital setup is initially important to develop strategies to deal with these LASA drugs. WHO, Joint National Commission and Institute of safe medication practices have provided reference list of such drugs and guidelines to be followed with their use.<sup>2,3</sup> However, this list cannot be anytime complete because of the addition of drugs for clinical use in every country. Also this list focuses on similar looking spellings of drugs or phonetics while similar appearance of formulations or packaging are not taken into consideration. A uniform LASA drug list to be referred globally would be an impossible job as the pharmaceutical companies differ in every country as well as their marketing norms.

To be safely handling LASA drugs and preventing disastrous consequences due to medication errors associated with these drugs, every hospital needs to prepare a LASA list of its setup and develop preventive measures for handling them.

In the present study, out of the total medication errors reported in 3 years' duration, only 2.67% were attributed to LASA category drugs. In a similar study conducted in France<sup>4</sup> over a period of 3 years, 6.4% were LASA drug incidences and of these 32.1% were classified as potentially lethal. Another study from Saudi Arabia mentions about look-alike/sound-alike medication problems to the extent of 7.54% out of the total medication errors.<sup>5</sup> In our study most of the LASA

incidences (64.71%) involved injectable formulations of drugs (ampoules, vials, infusion bottles) compared to the other forms of drugs. This finding is similar to the French study where injectable forms of drugs were involved in 60.7% of the LASA incidences.

Results of our study revealed that most of the errors were caused by Pharmacists (dispensing errors 45.71%) and nursing staff (computer indenting / ordering 22.85%, drug administration 20% and storage error 2.85%) [Figure 2]. When analysed for outcome, majority of the errors had either not reached patients (near miss incident 74.28%) or had not caused any harm to the patients (no harm type incident 20%). In the study reported from Saudi Arabia,<sup>5</sup> 70.5% errors corresponded to near misses and a very small percentage of errors (0.04%) caused temporary harm to the patients. In our study, harm was anticipated only in 2 cases where additional clinical monitoring was done to check for physiological parameters in these patients. In 1 case, Injection Phenergan (Promethazine) was administered in place of its sound-alike Injection Finamac (Paracetamol) and in the other intravenous Mannitol administered in place of look-alike 25% Dextrose infusion bottle. Both these cases happened in Emergency Medicine department where error was caused by nursing staff due to hurried drug administration.

### We at the study site have strategized the use of LASA drugs as follows

1. Identification of LASA drugs by applying colour coded stickers to them while storage in Pharmacy or wards. Drug containers looking alike in appearance were put yellow stickers and those drug names sounding alike phonetically were coded pink.

2. Extensive list of LASA drugs was prepared for the Dispensing Pharmacy. Patient care area-wise LASA drug lists were made separately for nurses and doctors to refer. Even the list was colour coded- look-alike drugs in yellow and sound-alike in pink colour.
3. Training of all healthcare professionals was conducted to follow precautionary measures while handling LASA drugs.
4. Revision of LASA drug list was planned annually as new drugs keep on adding to the drug formulary and sometimes pharmaceutical companies change their packaging.
5. Regular audit were planned to be conducted by Clinical Pharmacist to verify the implementation of above strategies.

We hope that with the use of above strategies and careful handling of LASA drugs, incidences with these would reduce and we would be able to provide safe and quality patient care.

**Other suggestions given by ISMP, The Joint National Commission, WHO, US FDA and International Medication Safety Network<sup>2,3,6</sup>**

- A) Use of bolded tall man (uppercase) letters to help draw attention to the dissimilarities in look-alike drug names. This would not be feasible in our setup as our prescribers write the drug names in capitals for legibility and clarity. This strategy has also been questioned for its effectiveness by authors in articles abroad.<sup>7,8</sup>
- B) Using both the brand and generic names on prescriptions and labels
- C) Including the purpose of the medication on prescriptions
- D) Configuring computer selection screens to prevent look-alike names from appearing consecutively

## CONCLUSION

Medication errors due to look-alike and sound-alike drugs were found at the study site but quite less in number. As dispensing, computer indenting and drug administration errors were the common of all such errors, cautious use of LASA drugs at the pharmacist's and nursing level is warranted for patient safety. Each hospital should prepare

its own LASA drug list for reference and advice precautions to the healthcare professionals while using such drugs.

## ACKNOWLEDGEMENT

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## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

## ABBREVIATIONS

**LASA:** Look-alike Sound-alike; **WHO:** World Health Organisation; **NABH:** National Accreditation Board of Health care Organizations; **ISMP:** Institute of Safe Medicine Practices; **US FDA:** United States Food and Drug Administration.

## SUMMARY

This study was planned to search out LASA drug related errors in a tertiary care hospital in Western India for a duration of Feb 2017 to Feb 2020. Preventive strategies were developed to avoid similar errors in future in the study setup. LASA drug incidences amounted to a small proportion (2.67%) of total medication errors. Majority of these errors were dispensing errors and of "Near miss" category 74.28% and most (24) of the errors were due to phonetically sound-alike drugs (68.57%).

## REFERENCES

1. Look-alike/sound-alike medication errors. Safety First Alert, Massachusetts Coalition for the Prevention of Medical Errors. 2001. <http://www.macoalition.org/documents/SafetyFirst4.pdf> Accessed on 19/03/2020
2. WHO Collaborating Centre for Patient Safety Solutions. Look-alike, Sound-alike medication names. 2007. <https://www.who.int/patientsafety/solutions/patientsafety/PS-Solution1.pdf> Accessed on 20/03/2020
3. FDA and ISMP Lists of Look-Alike Drug Names with Recommended Tall Man Letters. <https://www.ismp.org/sites/default/files/attachments/2017-11/tallmanletters.pdf>
4. Michelet-Huot E, Bacouillard JB, Quillet P, Bonnet M, Mongaret C, Hettler D. PS-106 Look-alike and sound-alike drug incidents in a hospital: A retrospective analysis. *Eur J Hosp Pharm.* 2017;24:A274.
5. Ali S, Aboheimed NI, Al-Zaagi I, Al-Dossari D. Analysis of medication errors at a large tertiary care hospital in Saudi Arabia: A retrospective analysis. *Int J Clin Pharm.* 2017;39(5):1004-7.
6. Institute for safe medication practices. List of confused drug names. 2019. <https://www.ismp.org/recommendations/confused-drug-names-list>.
7. Zhong W, Feinstein JA, Patel NS, *et al.* Tall man lettering and potential prescription errors: A time series analysis of 42 children's hospitals in the USA over 9 years. *BMJ Qual Saf.* 2015;25(4):233-40.
8. Lambert BL, Schroeder SR, Galanter WL. Does Tall Man lettering prevent drug name confusion errors? Incomplete and conflicting evidence suggest need for definitive study. *BMJ Qual Saf.* 2016;25(4):213-7.