

Assessment of Look-Alike, Sound-Alike and Read-Alike (LASARA) Medicine - Errors in Pharmacy

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ABSTRACT

Objective: To estimate chances of potential look-alike, sound-alike and read-alike (LASARA) errors in secondary-care hospital pharmacies through prescriptions screening.

Design: Cross-sectional, prospective study.

Place and duration of study: Al-Khidmat Hospital Pharmacy, Karachi, Pakistan from August to October, 2016.

Methodology: Dispensed medicine data was collected from three pharmacies of a secondary-care hospital in Karachi over three months. Only inpatient and outpatient prescriptions issued by the hospital were included. All outside referrals (OSRs) prescriptions without hospital stamp were excluded. LASARA medicines list, available at hospital, was considered to compare five-paired drugs, dispensed to patients; and screening alerts against these paired medicines were noted.

Results: Out of 1,000 monitored prescriptions, 200 prescriptions were shortlisted for 22 considered medicines. Total of 38 LASARA errors were reported in 90 days. Overall LASARA results were 38, 19% errors per 200 prescriptions. Highest dispensed error frequency was observed for injection™ lasix (14 errors, 36.8%), followed by tab. thyroxin (4 errors, 10.5%), injection avil™ (3 errors, 7.8%), Injection Calcium Gluconate (2 errors, 5.2%), and Tablet Lanoxin™ (2 errors, 5.2%).

Conclusion: LASARA errors during medicine dispensing on prescription at hospital pharmacies can be used as a tool to improve patient safety and pharmacist efficacy.

Key Words: Errors, Look Alike, Read Alike, Sound Alike, Dispensing, Drugs.

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INTRODUCTION

LASARA represents the drugs that have orthographic resemblance in terms of identical packaging or similar labelling from manufacturer; or visual similarity in terms of dosage form. Medications which share phonetically similar sound in spoken words or abstruse communiqué names mixing through verbal order may lead to sound-alike medicines error. Errors that transpire due to illegible handwriting are classified as read-alike errors (typographic issues).^{1,2} Medicines with identical appearance or alike naming as per FDA accounts for 10% of all medicine errors;³ while 29% of medicine errors are due to look-alike and sound-alike medicines. Similarly, 15-25% occurs because of confusion in naming medicine.⁴ In a Danish study, through evaluation of pharmacies self-reports on errors due to dispensing, the four most frequently observed errors were due to look-, read-, and sound-alike medicine traps, decreased concentration, ineffective controls and difficulty to read writing.⁵

More than 95,000 medication error reports were received in FDA from the year 2000 onwards. Out of all errors reported, nearly 25% errors were due to orthophonetic confusing medicine names.⁶

CPMP (the invented names review group) in European Union and FDA approved invented or trade names for pharmaceutical substances. But, the problem of LASARA error is still persistent. It has been observed that medication names with identical context generate psycholinguistics impact, which leads to misperception and outcome as an error.⁸

Faint or illegible handwriting script and use of abbreviation can cause confusion. Likewise, abbreviated treatment and management protocols stated as acronyms (e.g., CHOP, ABVD) can cause confusion.⁹ There can be environmental or unique factors that contribute to confused medicine dispensing. Environmental factors include working environment, storage areas, work distractions, etc. Unique factors include similar dose, indications, packaging, ingredients, placement, patient education, procurement etc.¹⁰ However, it has also been observed that due to lack of work force, increase work load, or repeated alerts appearance on computers, these notifications are often missed by healthcare professionals, which then lead to potent error.¹¹ Misreading of handwritten physicians order, pronounced drug name misidentification, mistakenly similarly coded or identical spelled medicines selection from computerised data base, or close placement of identical packaging medicines on shelves without marked labelling results in errors during dispensing.^{12,13} Unanimous alert systems availability in software at pharmacies, missing with

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strategic planning to avoid alert burden that can result in alert fatigue, due to excessively loaded alerts, pharmacists ignore or misses screeners.¹⁴

In developing countries like Pakistan, as awareness regarding use of orthographic, typographic and phonetic characteristics of medicines is scarce, so inadequate protocols implementation is observed. With this background, the aim of this study was to estimate chances of potential LASARA errors through prescriptions screening and enhance optimise patient safety.

METHODOLOGY

This cross-sectional study included 200 prescriptions primarily from three hospital pharmacies of a secondary-care hospital in Karachi, over a period of three months from August to October, 2016. Hospital's inpatient and outpatient department prescriptions were included. All outside referrals (OSRs) and without hospital letterhead prescriptions were excluded.

LASARA integrated medicines' list availability at hospital pharmacies was considered to monitor, report and intervene errors that were observed and reported during medicines prescribing, documenting, dispensing and administration. LASARA medicines, list contains both the generics and medicine trade names. Therefore, all medicine substitutions made within pharmacies for trading against any of the generic names on the prescriptions is also monitored to determine errors frequency. The files were reviewed again to check any duplications. These steps were monitored under pharmacists' supervision at the pharmacies, pharmacy technicians at dispensing counters, nursing stations and at physicians' end to determine the extent of potential tribulations.

RESULTS

Out of 1000 monitored prescriptions, 200 prescriptions were short-listed for 22 considered medicines. A total of 38 (19%) LASARA errors were reported per 200 prescriptions in 90 days. Highest dispensed error frequency was observed for Injection Lasix™ (14 errors, 36.8%), followed by Tab Thyroxin (4 errors, 10.5%), Injection Avil™ (3 errors, 7.8%), Injection Calcium Gluconate (2 errors, 5.2%), and Tablet Lanoxin™ (2 errors, 5.2%) (Table I). There were no LASARA incidence reported with Tablet Cardura™, Tablet Norvasc™, Tablet Aldomet™ and Tablet Sinemet™ respectively. However, LASARA medicines error percentage remained consistent with most of the medicines as shown in Table I (1 error, 2.6%) each. One hundred and sixty-two prescriptions were found to be LASARA errors-free.

The frequency of errors due to orthographic similarities was (50%), phonetic (7.8%), and read-alike visually interpreted errors (42.1%).

Medicines were grouped in to seven categories as shown in Table II. The results showed that 12 medicine errors occurred because of same packaging use from manufacturer. Injection Lasix and Tablet Lasix under category of read-alike error justified criteria for same generic, different dosage form, and same manufacturer error. Errors that occur because of an additional letter or specification recorded for 2 medicines (Tablet Surbex Z and Tablet Surbex T). Most errors were at the level of the pharmacist (15%) followed by the nursing station (13%). One error was reported under category of different generics under same antibiotics classified group

(Injection ceftriaxone and injection cefotaxime). Only one incident of IV flush with Injection Ca-Gluconate instead of distill water was reported done without earlier rectification in the ward; however, patient electrolytes was done later that appeared normal.

Table I: Errors intensification: From highly recurrent to least observed errors.

Proprietary name of supplied drugs	Non-proprietary name of supplied drugs	No. of observed errors
Tab. Thyrosin	Thyroxin	4 Errors
Inj. Avil	Pheniramine	3 Errors
Inj. Calcium Gluconate	Calcium Gluconate	2 Errors
Tab. Lanoxin	Digoxin	2 Errors
Tab. Zyrtec	Cetirizine	1 Error
Tab. Zyloric	Allopurinol	1 Error
Fucidin Cream	Fusidic Acid	1 Error
Syr. Dijex mp	Aluminium, Magnesium, Simethicone	1 Error
Inj Cefxone 1gm	Inj Cefotaxime	1 Error
Inj. Adrenaline	Adrenaline	1 Error
Inj Vitamin k	Vitamin k	1 Error
Inj s.cholin	Succinyl Choline	1 Error
Inj Amphyll	Aminophyllin	1 Error
Distill Water	Water for Injection	1 Error
Tobradex eye drops	Tobramycin	1 Error
Syr. Azomax	Azithromycin	1 Error
Tab. Surbex z	B complex + Zinc Oxide	1 Error
Tab. Cardura 2mg	Carvedilol	-
Tab Norvasc 2mg	Amlodipine	-
Tab. Aldomet	Methyl Dopa	-
Tab. Sinemet	Levodopa, Carbidopa	-

One error was reported under category of different generics under same antibiotics classified group (Injection ceftriaxone and injection cefotaxime). Only one incident of IV flush with Injection Ca-Gluconate instead of distill water was reported done without earlier rectification in the ward; however, patient electrolytes was done later that appeared normal.

DISCUSSION

The frequencies of look-alike errors (n=19) and read-alike errors (n=16) emphasize the requirement of more integrated practising of bold, Tall Man Letter, color codes, and pop-ups appearance in software. Lambert also explained that automated measures are used to determine which pair of medicines is more likely to cause error as compared to others.¹⁵ Tuohy, explained that when medication is dispensed through preset accessible dispensing trolleys at nursing stations without a pharmacist evaluation, over-filled storage space also trigger uncertainty and increase LASARA error

chances.¹⁶ However, guidelines adherence through repeated training session, trained pharmacists, and decrease in manual workloads through systems automation and bar code use can improve compliance.¹⁷

The results highlight that same manufacturing pattern and colour scheme from the pharmaceutical largely contribute in LASARA errors. Johnson *et al.* elaborated use of amber glass ampule with bright labelling on ampule to improve legibility and labelling design. This can be improved further by development of further improved guidelines involving pharmaceutical participation.¹⁸

Table II: Fallible proprietary/non-proprietary drugs/pairs classification.

Categories	Medicines	Fallible pairs
Different generics / same brand manufacturer	12	Tab thyroxin / tab lanoxin (look-alike)
		Inj zantac / Inj Amphyll (look-alike)
		Injavil / Inj lasix (look-alike)
		Syrdijex mp / syrcremaffin (look-alike)
		Tab cardura / tab norvasc (look-alike)
		Tobrex drops / tobradex drops (look-alike)
Analogous manufacturer / same generics (non proprietary names), different dosage form	2	Inj Lasix / tab lasix (read-alike)
Similar proprietor / with added specification	2	Tab. surbex Z / Tab. surbex T (look-alike)
Different generics in same antibiotics classified groups	4	Inj ceftriaxone / inj cefotaxime (read-alike, sound alike)
		Syrup azithromycin / syrup erythromycin (read alike, sound-alike)
Same generic / altered dosage form	2	Inj Lasix and Tab Lasix
Same brand name / diff composition / diff country	0	
Generic drug pairs / different manufacturer	0	

Errors by pharmacists (n=15) and nurses (n=13) occur because of many causative factors including human distraction element, extensive workload, inadequate staff in pharmacies, lack of training sessions, no bar code system in pharmacies, identical packaging from manufacturers, excessive focal orders on telephones, and similar codes in softwares. This is article in alignment with similar case reported by Naunton *et al.*¹⁹

Pharmacies must allocate separate area for LASARA drugs with coloured auxiliary labels. Abdelatif *et al.* suggested that episodic scrutiny through LASARA list must be revised annually.⁷ Moreover, use of uppercase alphabets for the orthophonetic identical medicines, such as Tall Man Letters, (Tab. hydroXYzine and Tab. HyDRALazine),²⁰ he stressed. Electronic alerts designing is recommended; and hospital management information system (HMIS) be introduced to reduce errors. Concept of boutique medicines should be adopted which involves particular training to segregate sensitive lights, high alerts, LASARA.

CONCLUSION

LASARA medicine errors frequency can be reduced further

through more vigilante, using more automated system implementation, separate shelving, nomenclature identification and material alerts.

CONFLICT OF INTEREST:

Authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:

RB: Planned, collected, analysed and wrote the manuscript.

MLR: Supervised and finalized the manuscript.

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