Near-Miss Lookalike and Soundalike Intravenous Medication Errors: A 12 Month Retrospective Study

James Waterson , BA, MMedEd; Rania Al-Jaber , RPh; Tarek Kassab, MSc, MD; Abdulrazag S Al-Jazairi , PharmD, MBA, FCCP, BCPS (AQ-Cardiology)

King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia

INTRODUCTION

There is insufficient of quantitative evidence in the current literature on the incidence of wrong medication and wrong dose administration of intravenous medications by clinicians. The difficulties of obtaining reliable data are related to the fact that at this stage of the medication administration chain, detection of errors is extremely difficult. Smart pump medication library logs and their reporting software record medication and dose selections made by users, as well as cancellations of selections and the time between these actions. Analysis of these data adds quantitative data to the detection of these kinds of errors

OBJECTIVES

The overall objective of this study was to establish, using an easily reproducible and reliable methodology, baseline data to show how metrics in the set-up and initial programming phase of intravenous medication administration can be produced from review of medication library "near-miss" reports from infusion pumps used in varied disciplines and care areas across large facilities with many thousands of IV pumps.

METHODS/ STUDY DESIGN

Study group performed a 12-month retrospective review of medication library reports from infusion pumps from across a facility to obtain metrics on the set-up phase of intravenous medication administration. Cancelled infusions and resolutions of all infusion alerts by users were analyzed. Decision times of clinicians were calculated from the time-date stamps of the pumps' logs.

RESULT

Incorrect medication selections represented 3.45% of all medication library alerts and 22.40% of all cancelled infusions. Of these cancelled medications, all high-risk medications, oncology medications, and all intravenous medications delivered to pediatric patients and neonates required a two-nurse check according to the local policy.

Wrong dose selection was responsible for 2.93% of all alarms and 19.08 of infusion cancellations.
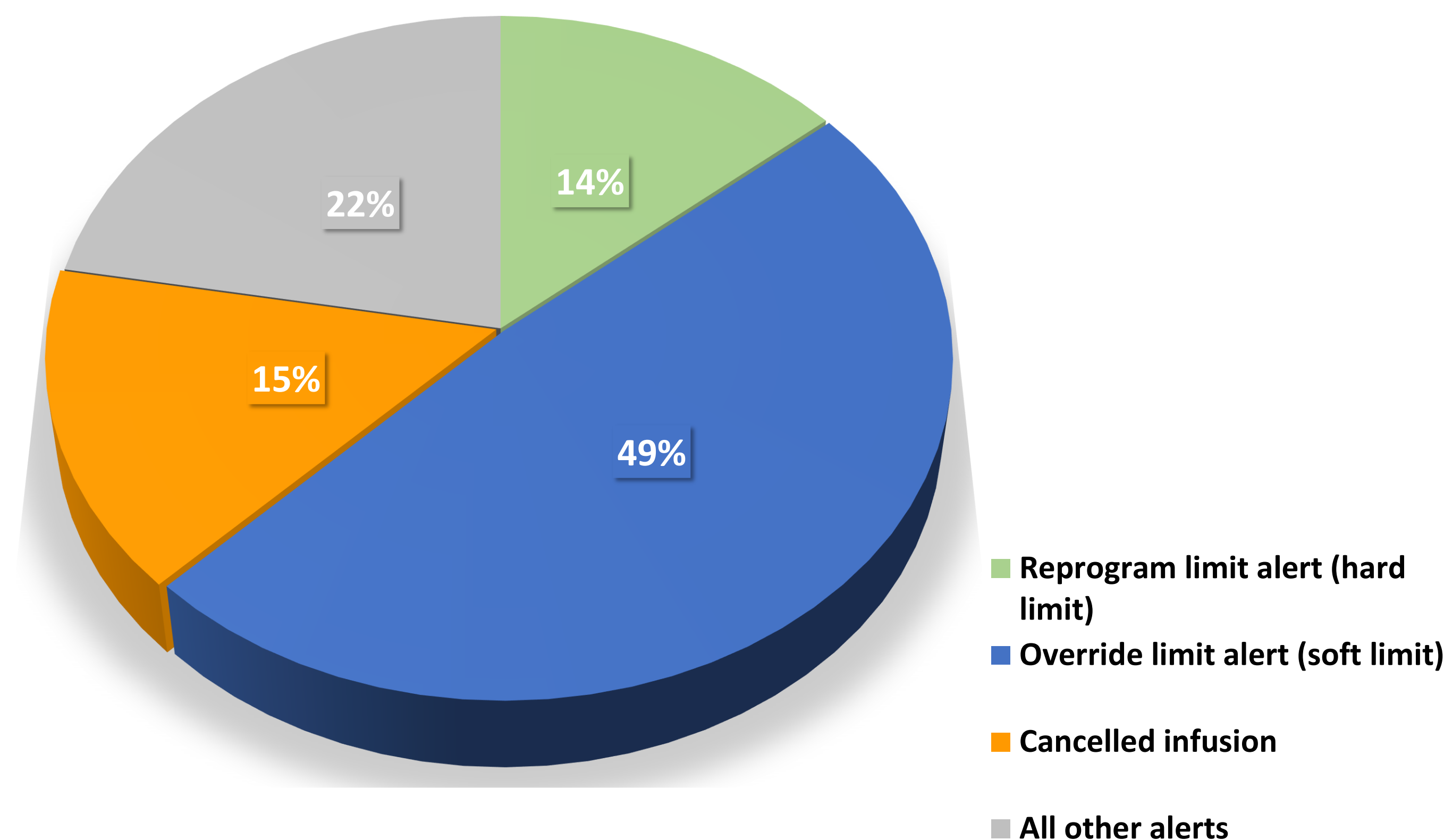
Average error recognition to cancellation and correction times were 27.00 s (SD 22.25) for medication error correction and 26.52s (SD 24.71) for dose correction.

The mean character count of medications corrected from initial lookalike-soundalike selection errors was 13.04, with a heavier distribution toward higher character counts.

The position of the word/phrase error was spread among name beginning (6991/10,017, 69.79%), middle (2144/10,017, 21.40%), and end (882/10,017, 8.80%).

RESULT

INCIDENCES OF THE CAUSES FOR CANCELLATION OF INFUSION

- 14% Reprogram limit alert (hard limit)
- 49% Override limit alert (soft limit)
- 15% Cancelled infusion
- 22% All other alerts

Examples of cancelled infusion medication names and corrected medication names

Cancelled drug/fluid	Final drug/ fluid	Key letter position
Sodium bicarbonate	Sodium phosphate	Name end
Acetylcysteine	Acyclovir	Name middle
Ceftazidime	Ceftriaxone	Name middle
Flucloxacillin	FLUconazole	Name middle
Calcium chloride	Calcium gluconate	Name middle
Cefazolin	Ceftazidime	Name middle
Insulin high non-ICU	Insulin hyperkalemia	Name middle

Incidence by word/phrase error position.

WORD ERROR POISITION INCIDENCE %

- Name beginning: 69.79
- Name middle: 21.4
- Name end: 8.81
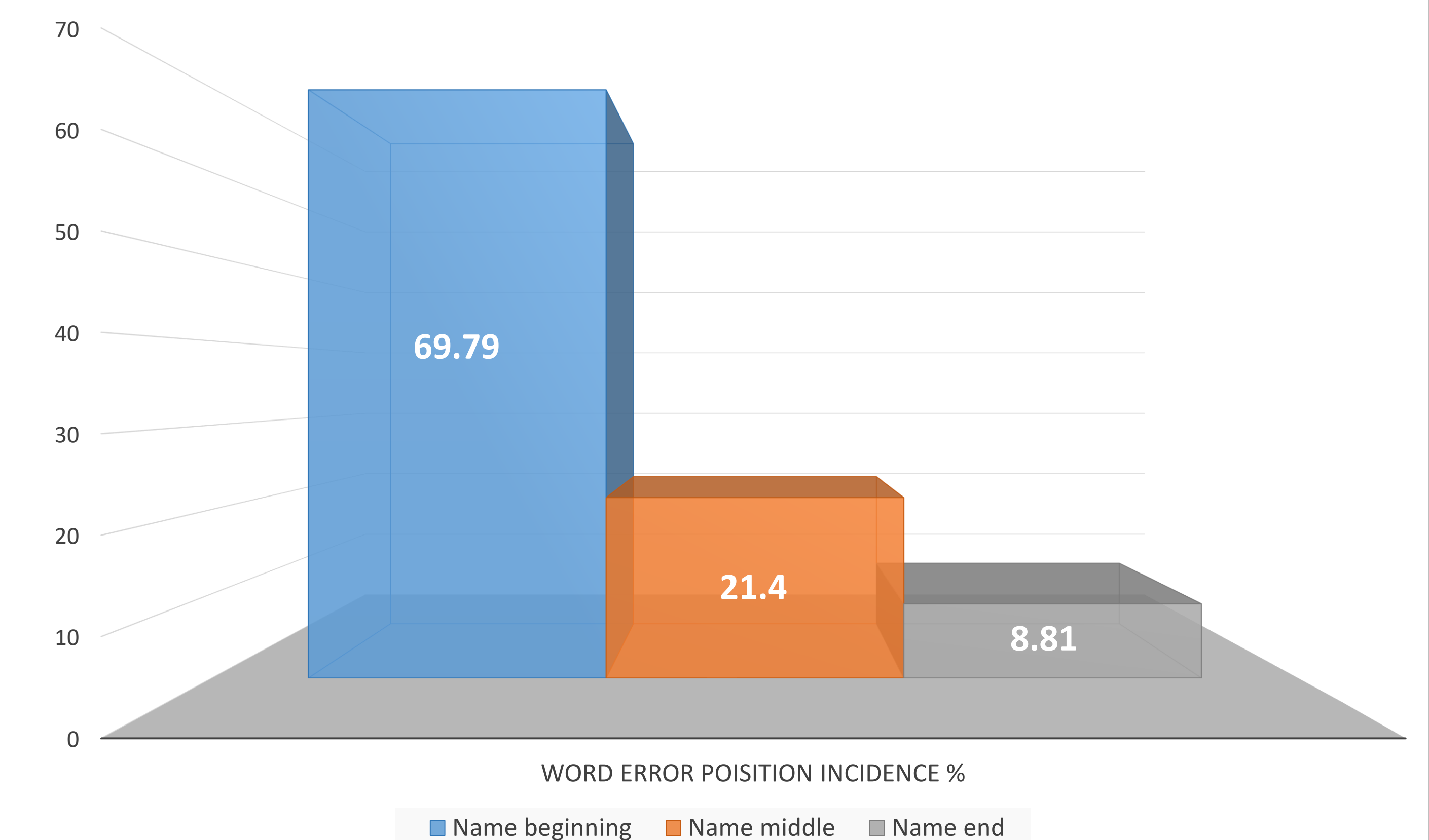
CONCLUSION

The study identified a high number of lookalike-soundalike near miss errors, with cancellation of one medication being rapidly followed by the programming of a second. This phenomenon was largely centered on initial misreading of the beginning of the medication name, with some incidences of misreading in the middle and end portions of medication nomenclature. The value of an infusion pump showing the entire medication name complete with TALLman lettering on the interface matching that of medication labeling is supported by these findings. The study provides a quantitative appraisal of an area that has been resistant to study and measurement, which is the number of intravenous medication administration errors of wrong medication and wrong dose that occur in clinical settings.

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