



ADHERENCE TO INTRAVENOUS TO ORAL SWITCHING CRITERIA IN A TERTIARY GOVERNMENTAL HOSPITAL IN RIYADH, SAUDI ARABIA

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BACKGROUND

- A report that was released by the World Health Organization (WHO), indicated that the irrational use of medications is a serious issue that requires serious intervention¹.
- The switching of intravenous (IV) medication administration to the oral (PO) route is a common practice in healthcare settings.
- It offers numerous benefits including lower risks for nosocomial infections and thrombophlebitis, lower costs, early discharge and enhanced patient convenience.
- The more frequent use of the IV medication while the oral options are available is one of the clear indications of this irrational use of medications.
- Not all the cases would be suitable for the oral route, like the Intensive Care Unit (ICU) patients and patients who can not absorb drugs through the enteral route.
- Physicians tend to prefer the IV route, a common concept that the IV route have higher bioavailability and make the patient improve much faster².
- Another common concept among physicians is that the complete treatment with the IV route would result in less chances to incidence of re-infections.
- Antibiotics, drugs used for Gastrointestinal (GI) Disorders and Antifungals are among the common medications that are candidates for the IV to PO switching³.

OBJECTIVES

- To assess the IV to PO switching in one of the major tertiary governmental hospitals in Riyadh, Saudi Arabia,
- To determine the percentages of patients who were eligible and ineligible for switching, and
- To determine the percentages of actual switching among both groups.

METHODS

- A retrospective analysis was conducted on a sample of cases from a tertiary governmental hospitals in Riyadh, Saudi Arabia from 2018 - 2020.
- The criteria for IV to PO switch were designed and implemented by the clinical pharmacists.
- Patients files were reviewed on daily basis to determine if the they fit the switch criteria and to give the recommendation of switching if they do.
- Data regarding the switching from IV to oral route were collected from patient medical records.
- The primary outcomes included the numbers and percentages of successful and unsuccessful switching.

- The criteria were mainly assessing the ability to use the oral route, the resolution of the symptoms (infection symptoms after 3 days of IV therapy, GI bleeding, fever etc.) and not being in critical condition (ICU or emergency patients).
- The switching forms were completed by clinical pharmacists and Clinical Pharmacy Residents and collected and summarized by the primary investigator.
- Descriptive statistics were used to present the results, especially the percentages of switch/no switch among eligible and ineligible groups and Chi-Square and Fisher's Exact Tests were used at a significance level of <0.05.
- The data were collected using Microsoft Excel (2021, Microsoft) and inferential statistics were done using SPSS Statistical Package (IBM Corp. Released 2021. IBM SPSS Statistics for Windows, Version 28.0. Armonk, NY: IBM Corp).

RESULTS

- The study included a total of 1225 patients. Those patients were selected during the study period by the clinical pharmacists and the clinical pharmacist residents.
- Out of the total patients selected for this study, a total of 355 patients met the IV to oral switching criteria while 870 did not meet the criteria.

Table 1: Number of Patients who Fit / do not Fit the Switching Criteria and Decisions Made

ASSESSMENT OF THE CASE		SWITCHED		ROW TOTAL
		Yes	No	
FIT THE CRITERIA	Yes	231	124	355
	No	2	868	870
COLUMN TOTAL		233	992	

Table 2: SPSS Generated Results for the Percentages of Switch among Patients who fit the Switch Criteria and Patients who do not

Assessment of the Case and the Counts			Switched Y/ N		Total
			No	Yes	
Meet the criteria Y/N	No	Count	868	2	870
		% within Meet the criteria Y/N	99.8%	0.2%	100.0%
	Yes	Count	124	231	355
		% within Meet the criteria Y/N	34.9%	65.1%	100.0%
Total		Count	992	233	1225
		% within Meet the criteria Y/N	81.0%	19.0%	100.0%

Table 3: SPSS Generated Results for Pearson Chi-Square and Fisher's Exact Tests

Test	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	688.192 ^a	1	0.000		
Continuity Correction ^b	683.988	1	0.000		
Likelihood Ratio	704.297	1	0.000		
Fisher's Exact Test				0.000	0.000
N of Valid Cases	1225				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 67.52

b. Computed only for a 2x2 table

- Among the the patients who met the switching criteria, 231 (65.07%) were successfully switched from IV to oral route, while 124 (34.93%) were not switched.
- Out of the cases that did not meet the switching criteria for conversion (870), only 2 cases (0.2%) were actually switched, while 868 cases (99.8%) were not switched.
- Overall, 233 patients (19.02% of all patients) were switched.
- The Fisher's Exact Test's 2 tailed p-value was statistically significant (<0.001) for the percentage of switch among patients who did meet the switch criteria.
- The Chi-Square test assumptions for the sample size for each sub-population was violated (less than 5 in some or all sub-populations), hence the Fisher's exact test^{4,5} was used as a replacement to calculate the statistical significance of the percentages of switch among patients who meet the criteria (65.07% vs. 34.93%) which was statistically significant (p<0.05, Table 3).

CONCLUSIONS

- The findings indicate that the majority of patients who met the switching criteria were switched from IV to oral route, demonstrating a good switching rate among eligible patients. However, there were few cases where ineligible patients were switched, highlighting the need for adherence to appropriate patient switching criteria.
- The study emphasized the importance of developing strategies to improve medication administration practices and implementing IV to oral switching protocols to optimize patient care and achieve potential cost savings.
- These findings provide valuable insights for healthcare providers and policymakers. At the same time, we strongly believe that such study emphasizes the significant role of clinical pharmacists' recommendations and advices in optimizing medication choices , and improving patient care.

REFERENCES

1. The pursuit of responsible use of medicines: Sharing and learning from country experiences. [Last accessed on 2013 Jun 29; Last updated on 2022 Aug 22]. Available from: <https://www.who.int/publications/i/item/WHO-EMP-MAR-2012.3>
2. Fischer MA, Solomon DH, Teich JM, Avorn J. Conversion from intravenous to oral medications: assessment of a computerized intervention for hospitalized patients. Arch Intern Med. 2003 Nov 24;163(21):2585-9.
3. Banko H, Goldwater SH, Adams E. Smoothing the Path for Intravenous (IV) to Oral (PO) Conversion: Where Have We Come in 11 Years? Hospital Pharmacy. 2009;44(11):959-967. doi:10.1310/hpj4411-959.
4. Fisher R. A., "Statistical methods for research workers", (5th ed.) Edinburgh: Oliver & Boyd, 1934.
5. R. A. Fisher, Journal of the Royal Statistical Society, Vol. 98, No. 1 (1935), pp. 39-82