

Pharmaceutical validation : centralized or on ward ?

A retrospective comparative study

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Introduction

Medication errors are a significant concern in industrialised countries and can occur in up to 67% of hospitalised patients, are preventable in up to 52% of cases and can lead to serious adverse events in 2-3% of cases. Among these errors, prescribing errors are the leading cause of adverse events in hospitalised patients. Pharmaceutical validation, defined as the review of drug orders by a pharmacist, combined with a clinical decision support system (CDSS), has been shown to decrease these errors and increase medication safety. However, pharmaceutical validation can be performed either at the central hospital pharmacy or on ward, integrated in a clinical pharmacy activity. Whether on ward validation lead to a higher rate of prescribing error's detections than central validation, comparison of type of errors detected, acceptance rate and clinical impact for patients have not been studied yet.

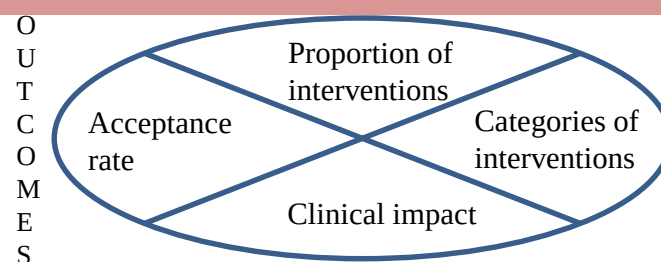
Aims

The aim of this study is to compare central and on ward pharmaceutical validation of a cardiology unit medical prescriptions, to detect any difference in term of quality and safety.

Methods and outcomes

Our retrospective comparative study was conducted at the Cliniques universitaires Saint-Luc, a tertiary care hospital (Brussels, Belgium).

Analysis of pharmaceutical interventions made by pharmacists secondary to a prescribing error of a cardiology prescription, at the **central hospital pharmacy**, in Sept. and Nov. 2018, were compared to those made by the **on ward pharmacy** resident in Feb. and March 2019.



Results

Prescriptions of 698 and 701 patients were analysed in the central pharmacy group and on ward group respectively.

2,9% (20/698) and **13,2%** (93/701) of patients had interventions in the central pharmacy group and on ward group respectively ($p < 0,001$).

84% and **65%** of **on ward** and **central** interventions respectively were accepted or partially accepted (Fisher's test, $p = 0,058$) (figure 1).

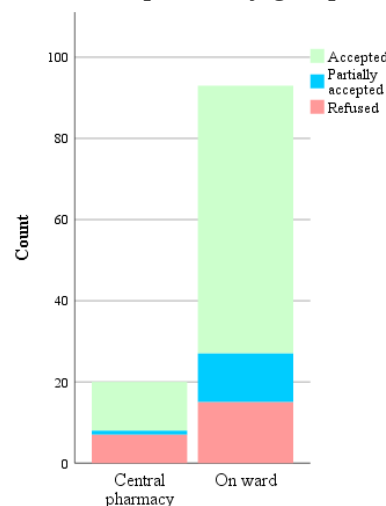


Fig 1. Number of interventions and acceptance rate by group

At the central pharmacy, most interventions were made because of drug-drug interaction, overdosing and computerized-related error, mostly relying on CDSS alerts, while most on ward interventions were for no valid indication, overdosing and inadequate or non-optimal choice of drug regarding guidelines (figure 2 and 3).

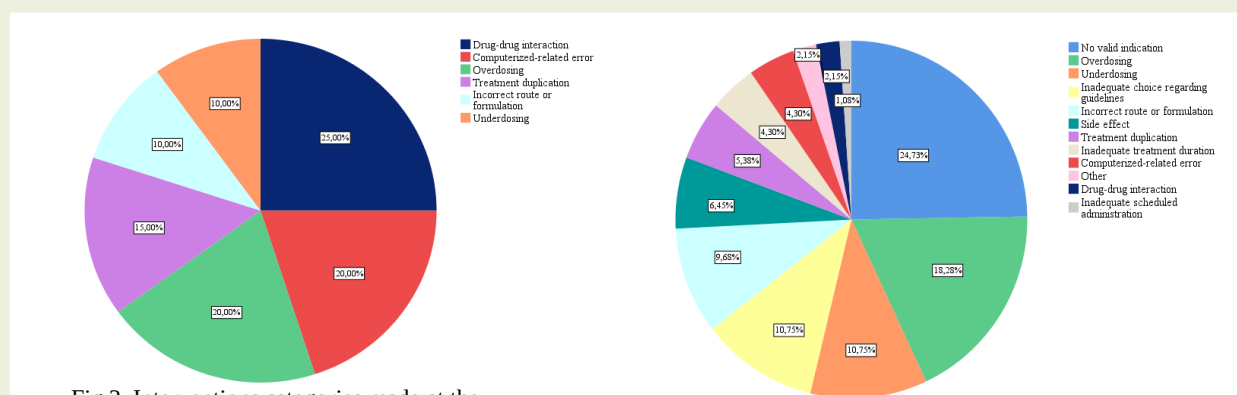
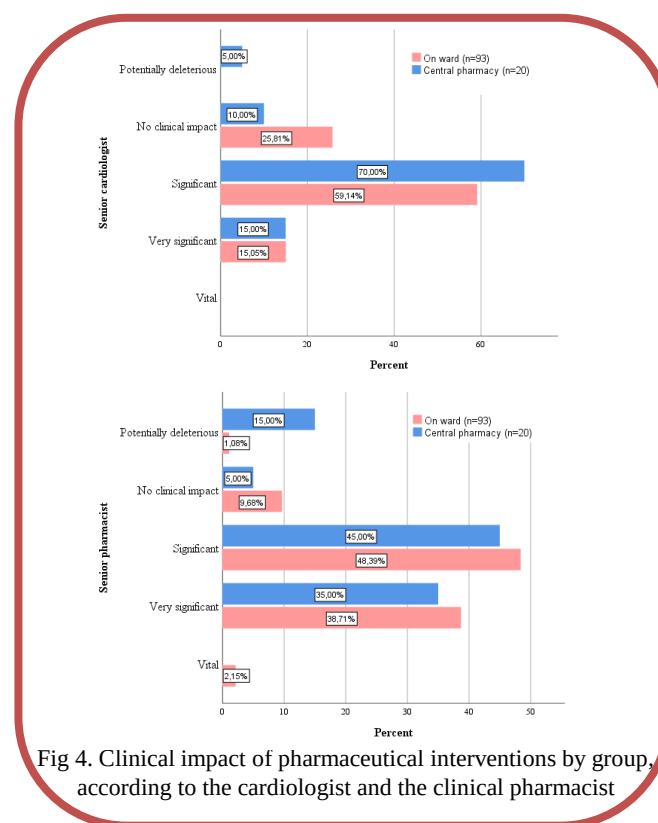


Fig 2. Interventions categories made at the central pharmacy (n=20)

Fig 3. Interventions categories made on ward (n=93)

A similar proportion of interventions were rated as significant in both groups, but interventions with **vital clinical impact only** occurred in the **on ward group** and this group also showed **less interventions** with potentially **deleterious clinical impact** (e.g: blockade of a medicine that should not have been blocked regarding guidelines) (figure 4).



Conclusion

The benefit of on ward pharmaceutical validation is a higher rate of prescribing error's detection, as well as better accepted and more accurate pharmaceutical interventions going further than CDSS alerts. It must be considered as a complementary approach in targeted unit to improve medication safety and quality of care. A qualitative study could help understanding the perspective of physicians on the pharmaceutical validation services.

Acknowledgments and contacts

I would like to thanks the staff of the cardiology unit of the CUSL, Dr F. Maes, Prof. O. Dalleur and all the staff of the pharmacy department.

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This work was performed as a part of the specialized master in hospital pharmacy, UCLouvain

November 2020