25th Congress of the EAHP
25th – 27th March 2020 Gothenburg

Abstract n. 3PC-010
ATC code: L01 - Cytostatics

https://www.eahp.eu/25-3PC-010

Evaluation of the production accuracy and error rate in the automated compounding of cytotoxic preparations by a robot

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BACKGROUND AND IMPORTANCE

In the pharmacy of Münster University Hospital, the robot APOTECAchemo has been installed and implemented in the daily cytostatic production since March 2017. The fully automated production of cytostatic preparations using robot technology ensures a high dosage accuracy in the compounding of preparations and complete documentation, as well as minimizing the risk of occupational exposure of pharmacy staff, avoiding direct contact with toxic substances.

AIM AND OBJECTIVES

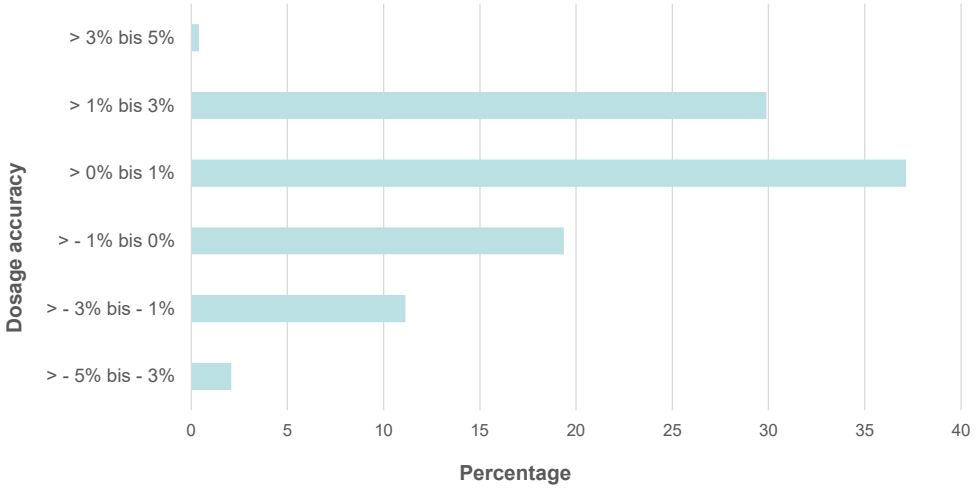
The aim of this analysis was to evaluate the production dosage accuracy with APOTECAchemo and the fail rate of the robot during the production.

MATERIALS AND METHODS

Using the statistical software "APOTECAm@A", where the performance of the robot can be regularly analysed, the automated production of the pharmacy was monitored from January to October 2018, focusing the attention on the dosage accuracy of the automated compounded preparations and the robot error rate. The results of the analysis would determine the performance of the system in terms of preparations quality and safety and production efficiency.

RESULTS

The error rate of the robot was ~ 1% of the total automated production. Regarding the dosage accuracy of the successful preparations produced by APOTECAchemo, it has been found that 97.5% of the preparations had a dosing accuracy between 0 and +/- 3%. The remaining 2.5% of the preparations produced with the robot system were within the limits of +/- 5% dosage tolerance, which was defined by the pharmacy as a tolerance limits.



CONCLUSION AND RELEVANCE

The analysis carried out using APOTECAm@A shows a high dosage accuracy in combination with a low percentage of error regarding the automated production. The data show a high quality level as well as a high reproducibility and safety of the production with APOTECAchemo. The standardization of the processes resulting from the introduction of a robotic solution for the cytostatic production was decisive in terms of increasing of quality and the safety of the preparations produced.