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Reduced prevalence of drug-related problems in psychiatric inpatients after implementation of a computerized physician order entry system

K. Wien[1], J. Thern[1], A. Neubert[1], B.L. Matthiessen[2], S. Borgwardt[2,3].
[1]Universitätsklinikum Schleswig-Holstein, Hospital Pharmacy, Lübeck, Germany.
[2]Universitätsklinikum Schleswig-Holstein, Department of Psychiatry and Psychotherapy, Lübeck, Germany.
[3]Universität zu Lübeck, Center of Brain, Behavior and Metabolism, Lübeck, Germany.

BACKGROUND

In 2021, a computerized physician order entry (CPOE) system with an integrated clinical decision support system (CDSS) was implemented at a tertiary care centre for the treatment of mental health conditions in Lübeck, Germany. The CDSS is supposed to support physicians in the process of drug prescription and simplify medication review by hospital pharmacists. However, no study has been reported on the types and prevalence of drug-related problems (DRPs) before and after CPOE implementation in a psychiatric inpatient setting.

The **aim** of this retrospective before-and-after cohort study was to investigate whether the implementation of a CPOE system with CDSS accompanied by the introduction of regular medication plausibility checks by a pharmacist leads to a decrease of DRPs during hospitalisation and to less unsolved DRPs at discharge in psychiatric inpatients.

METHODS

Medication charts and electronic patient records before (cohort I) and after (cohort II) CPOE implementation were reviewed retrospectively by a clinical pharmacist who collected and classified all identified DRPs based on 'The PCNE Classification V9.1' [1], the German database DokuPIK [2], and the 'NCC MERP Taxonomy of Medication Errors' [3]. Statistical analyses were performed using Mann-Whitney-U, Chi-squared or Fisher's exact tests. A generalized mixed methods linear model for the negative binomial distribution was computed.

RESULTS

Significantly less DRPs were identified after CPOE implementation (OR=0.545, 95% CI [0.412, 0.721], p<0.001) (Fig. 1). In cohort I, the most frequent cause for DRPs were prescription errors (34.8%) which were significantly reduced in cohort II (5.6%, p<0.001). The most frequent cause in cohort II was drug interaction (35.1%) which was also common in cohort I (30.8%; p=0.303). In cohort II, 61 interventions were suggested by the clinical pharmacist of which 54.1% were accepted and fully implemented by the treating physicians. During the retrospective in-depth review, additional DRPs not found in the daily plausibility analyses were identified, such as adverse drug reactions (ADR). At hospital discharge, 3.6 (SD ± 2.9) and 2.0 (SD ± 2.1) DRPs per patient remained unsolved in cohort I and cohort II (OR=0.573, 95% CI [0.415, 0.793], p<0.001).

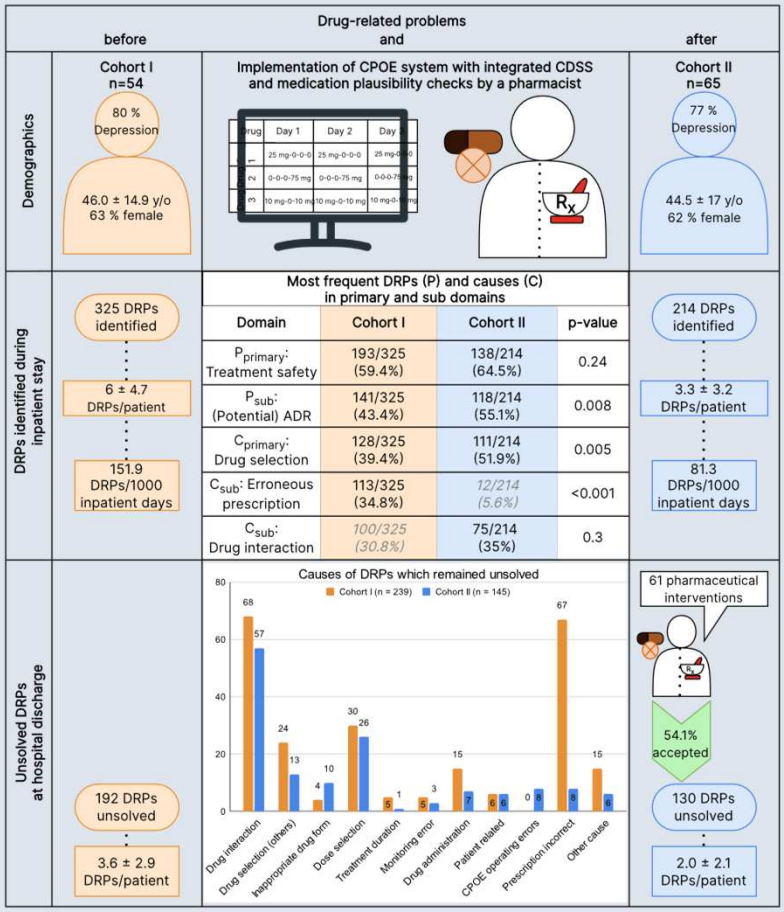

Fig. 1
Prevalence and types of DRPs before and after implementation of a CPOE system with integrated CDSS and medication plausibility checks by a pharmacist. Multiple causes possible for one DRP. ADR: Adverse drug reaction. In the graph "Causes of DRPs which remained unsolved" other detailed causes are summarized as "Drug selection (others)".

CONCLUSIONS

The implementation of a CPOE system with an integrated CDSS reduced the overall prevalence of DRPs, especially of prescription errors, and led to a smaller rate of unsolved DRPs in psychiatric inpatients at hospital discharge. Not all DRPs were found by simple plausibility checks based on the medication charts. A more interactive and interdisciplinary patient-oriented approach might result in the resolution of more DRPs.

Disclosure: No potential conflicts of interest.

References: [1] Pharmaceutical Care Network Europe Association, 2020. The PCNE Classification V9.1. [2] Ihbe-Heffinger, A. et al, 2019. Prospective survey-based study on the categorization quality of hospital pharmacists' interventions using DokuPIK. Int J Clin Pharm 41, 414-423. [3] National Coordinating Council for Medication Error Reporting and Prevention, 1998. NCC MERP Taxonomy of Medication Errors.

Wissen schafft Gesundheit

Contact
Katharina Wien
Universitätsklinikum Schleswig-Holstein, Ratzeburger Allee 160, 23538 Lübeck, Germany. Email: Katharina.Wien@uksh.de