Background The Ministry of Health in Norway has requested an expanded contribution from clinical pharmacy in healthcare delivery because of serious medication-related issues. Examples of this are participation in treatment teams in hospital wards and review of the patient’s total use of medicine in cooperation with a medical practitioner. The concept of integrated medicines management (IMM) has been approved as a model to enhance medication effectiveness and safety.

Purpose The objective of this study was to evaluate the clinical significance of recommendations made by pharmacists in drug-related problems (DRP).

Materials and Methods The study was conducted on a respiratory ward and a hematology ward at the University Hospital of St. Olav, Trondheim, Norway. Patients admitted to hospital in the period of June to October 2011 were included. All patients using one or more drugs at admission, having DRPs identified by the pharmacist according to the IMM (Integrated Medicine Management) model, were included. DRPs were identified through medicines reconciliation and medication reviews. All recommendations made by the pharmacists were independently assessed and scored by a physician with a special interest in pulmonary diseases, or respectively rheumatology, a clinical pharmacologist and a clinical pharmacist. A Hatoum six-point scoring system [1] for assessing the quality of pharmacists’ interventions was used, with rankings between 1. Adverse significance – (the recommendation supplied by the pharmacist may lead to adverse outcome and 6. Extremely significant – information qualified by life and death situation.).

Results A total of 112 recommendations in 46 patients (average age 66 years), were assessed. On average 4 DRPs per patient were found. 85% of the recommendations were assessed as somewhat significant or more (≥ rank 3). The physicians accepted 71% of the pharmacists’ recommendations.

Conclusions Recommendations made by pharmacists were assessed as clinically significant to a large extent. The fact that the physicians followed the pharmacists’ recommendations in most cases, demonstrates the effectiveness and value of the IMM model in improving patient drug treatment.

Reference

No conflict of interest.

Purpose Guided pharmaceutical interviews were conducted (i) to invite patients to provide feedback on the ADRs, to follow known DDIs, (ii) to encourage patients to communicate potential problems and to adapt pharmacological advice.

Materials and Methods The study was conducted between January and April 2012. Patient interviews on ADRs and DDIs were performed every month, during drug dispensing for outpatients by hospital pharmacists. They collected data based on questionnaires which included the documented adverse effects [1, 2] and co-medications [3].

Results 86 questionnaires were completed with TVR patients and 65 with BOC patients. A total of 41 TVR and 62 BOC patients were examined for ADRs (data from the first month were excluded). All patients had ADRs like those reported in the SPC (1, 2). The most common ADRs were anaemia (52%) and cutaneous manifestations (65%), especially dry skin (44%). Anaemia was more frequent in patients on BOc (56% BOC/45% TVR) but could be more severe with TVR. 55% of BOC patients and 29% of TVR patients were given erythropoietin and no BOC, but 3 TVR patients were transfused. Fatigue, rash, and pruritus were more frequent with TVR patients. Some ADRs were reported only by BOC patients: dysgeusia, alopecia and weight and appetite loss. Since DAAs are CYP 3A4 substrates and inhibitors, 58 potential interactions were identified and sometimes required close monitoring.

Conclusions Interviews enabled patients to talk about their ADRs and to express feelings on difficulties faced during their treatment. Hospital pharmacists gave them, in response, moral support and modified the advice they gave. They put patients’ mind at rest about ADRs and raised patients’ awareness of potential DDIs. Finally, the results on ADRs were reported to the health authorities in order to contribute to monitoring the risks related to these new drugs.

References

No conflict of interest.
an Excel® spreadsheet which logs a range of criteria, such as the patient’s sociodemographic background, the drug(s) involved, the type of error, the associated pharmaceutical intervention and many others.

**Results** 60 errors for 1000 patient days, that is 0.5 error per stay and 90 errors per 1000 prescriptions were detected for short stays. 1393 errors of all types were detected over 5 months, which is 0.9 error per month and per bed. The errors were spread over 3 categories: errors defined by the French Clinical Pharmacy Society criteria (67.3%), errors linked to the computerised tool (14.3%) and other types of error (18.4%). 5 drug classes were heavily involved. 59% of patients were affected by an error despite a prior pharmaceutical intervention. Errors rarely have drastic consequences on the patient: 4% prescriptions. Weaknesses in knowledge and malpractice represent nearly 85% of the total of errors. Errors due to computer parameters represent an increasing risk (14%).

**Conclusions** Most prescribing errors are avoidable. Although computerised physician order entry is a way of making the medication process safer, it also generates comments and has limitations. The prescription tool determines the type and frequency of errors. All these errors justify the analysis of all the prescriptions by a pharmacist, as s/he has a rounded knowledge of the patient beyond the medical prescription. The booming certification of various software packages dedicated to helping hospital prescription writing in a way acceptable to the High Authority for Health contributes to this step of making care safer and will hopefully lead to a decrease in errors.

No conflict of interest.