The role of clinical pharmacists in the optimisation of medication prescription and reconciliation on admission in an emergency department

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ABSTRACT

Objectives To describe a clinical pharmacist's (CP) activity in an emergency department (ED) regarding medication reconciliation and optimisation of pharmacotherapy of patients at hospital admission.

Methods A 1-year prospective observational study was conducted to analyse the activity of a CP in the ED of a 350-bed hospital in Spain. The CP reviewed home medications and medical prescriptions of patients to perform medication reconciliation if required and intervene if medication errors were detected.

Results The CP reviewed medications and medical orders of 1048 patients. 816 patients had home medication: 440 patients (53.9%) were correctly reconciled by the physician; 136 (16.7%) were reconciled by the physician with unintentional discrepancies; and 240 (29.4%) by the CP, with a higher percentage in patients admitted to surgical departments (χ^2 :38.698; $P<0.001$). Following pharmaceutical validation, 434 pharmaceutical interventions were performed.

Conclusions The presence of a CP in an ED could increase the detection of reconciliation errors and help resolve medication errors.

INTRODUCTION

Patient safety, in particular drug-related safety, is considered a priority in hospital settings. A recently published meta-analysis of observational studies estimated the incidence of adverse events during hospital admission to be between 2% and 22%, although a high heterogeneity was found depending on where the studies were performed and follow-up methodologies of the events.¹ In Spain, according to the Spanish National Study of Adverse Events (ENEAS),² 37.4% of events identified in inpatients have been attributed to drugs and, of these, 34.8% were preventable.

Transitions of care, during which new drugs are added and patients' previous home treatments are modified or removed, are a weak point where the risk of preventable medication errors is increased. Unintended discrepancies are seen in 50% of patients at the time of hospital admission and these, in turn, may be responsible for the occurrence of adverse reactions in 39% of cases.³

Medication reconciliation is defined as 'the process of identifying the most accurate list of all medication a patient is taking – including name, dosage, frequency and route – and using this list to

provide correct medications for patients anywhere within the health system'.⁴ This reconciliation, in which the pharmacist plays a key role as the person responsible for optimising drug therapy, has been shown to be an essential tool in resolving discrepancies and, as a result, in reducing medication errors.⁵

Emergency departments (ED) may be especially susceptible to medication errors due to multiple factors: workload, lack of coordination between services, inadequate identification of patients, duties, high workload shifts, interruptions and miscommunications between health professionals.⁶ This is why these units may greatly benefit from a medication reconciliation process involving the presence of pharmacists, whose skills and activities in the ED have been consolidated and described by the American Society of Health-System Pharmacists.⁷ However, the European Association of Hospital Pharmacists does not yet provide general recommendations in relation to this in our continent.

The objectives of this study were to describe the tasks performed by a part-time clinical pharmacist (CP) in an ED in relation to medication reconciliation at the time of admission and optimisation of drug therapy, and to analyse the characteristics of the patients involved in this process.

METHODS

A 1-year prospective observational study was conducted. The study was performed at a 350-bed hospital in Spain providing care to a population of 404 426 inhabitants, which received 114 365 visits during 2016.

The CP was at the ED from Monday to Friday, 12:00 to 14:00, except on public holidays, amounting to a total of 227 days per year.

The CP reviewed the medical orders of patients admitted to the ED to detect medication errors and intervene in such cases, and performed reconciliation of home medications for patients whose admission had been confirmed by the physician. Reconciliation involved reviewing and verifying all home medications and making sure these were being given before admission, identifying four possible scenarios:

1. Patient without medication.
2. Patient on home medication whose prescribing physician did not perform medication reconciliation.

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3. Patient on home medication reconciled by the prescribing physician, with unintentional discrepancies.
4. Patient on home medication reconciled by the prescribing physician, without unintentional discrepancies.

The pharmacist obtained the information on drug therapy from the electronic medical records and during a structured interview (online supplementary file S1) with the patient and/or a relative to draw up a Medication Reconciliation Report. This report included some recommendations to optimise the drug therapy in accordance with the main clinical guidelines on reconciliation:⁸ maintain (always considering the patient's clinical status); discontinue (if contraindicated or medication had little therapeutic value); and replace (therapeutic interchange or adaptation of medication to the site's protocols, e.g. for analgesia or insulin therapy, and so on). Additionally, we recorded relevant interactions, duplicate therapies or potentially inadequate medications in elderly patients.

The report was given to the prescribing physician and unintentional discrepancies were communicated verbally and corrected at that time. If the physician was not available, an alert was issued through the electronic prescription programme.

All patients whose treatment was reviewed by the CP were included in the study, except paediatric patients and patients who required emergency surgery or ICU admission.

We collected patients' demographic characteristics (age, gender), classified patients as medical or surgical according to the department to which they were admitted and we reviewed who was reconciled by physicians, analysing whether medication reconciliation was performed by the physician and/or the pharmacist depending on the type of patient (surgical vs. medical).

Reconciliation errors, defined as unintentional discrepancies, detected by the pharmacist were collected.⁹ Additionally, we reviewed and analysed the type of pharmacist interventions (PI) performed as a result of the review and validation of the prescribed drug therapy.

The statistical analysis was performed using absolute frequencies (percentages) for qualitative variables and central measures (mean) with dispersion measures (SD, range) for quantitative variables. We performed a comparative analysis by conducting a χ^2 test using IBM-SPSS-V.19 statistics (considering a P value < 0.05 as statistically significant) to study the relationship

between the need for home medication reconciliation and type of patient (surgical vs. medical).

RESULTS

Home treatments of 1048 patients were reviewed, accounting for 16% of all daily hospital admissions on average. Of these 602 patients, 57.4% were men, with a mean age of 71SD15 years (692 patients above 65 years' old); 782 (74.6%) were admitted to medical departments; and 266 (25.4%) to surgical departments.

Of all patients, 816 (77.9%) had prior medication. Of these, 440 patients (53.9%) were correctly reconciled by the physician, 136 (16.7%) were reconciled by the physician but unintentional discrepancies were identified by the CP, and 240 (29.4%) were reconciled by the pharmacist. The percentage of reconciliations performed by the CP was found to be significantly higher in surgical specialties (46.4%) than in medical specialties (23.6%) (χ^2 : 38.698; $P < 0.001$) (online supplementary table S2).

147 reconciliation errors were identified in the 136 patients. The types of reconciliation errors detected were: omission of clinically relevant medication (85.7%); wrong dose or dosage regimen (7.5%); prescription of drugs the patient was no longer taking (2.0%); and other (language barrier, lack of information sources, and so on: 4.8%).

Following pharmaceutical validation, 434 PIs were performed in patients whose home medication had been reviewed at the ED, representing a mean of 1.9 interventions performed per day. The different types of PIs performed are shown in figure 1. The most common one was the adaptation of medication to the hospital's guidelines (therapeutic interchange).

DISCUSSION

In this study we have analysed the benefits of including a CP in the ED of a hospital to optimise the drug therapy of patients presenting at the ED and provided structured working methodology and patient interview.

In almost half of the patients presenting at the ED with prior home treatment, adequate medication reconciliation was not conducted when the physician prescribed the medication. The studies performed by Cornish *et al*¹⁰ and Gleason *et al*¹¹ indicate that 30% to 70% of patients' treatments at the ED contain

Figure 1 Type of pharmacist interventions performed in patients validated at the emergency department (N=434).

unintentional discrepancies with their previous treatment. In our study, this figure was found in the middle of this range. This could warrant the presence of pharmacists to help in the process of reconciliation, not only in patients reconciled by themselves but also in those who have been previously reconciled by the physician.

The frequency of PI was higher in the group of patients from surgical departments. Our percentage is similar to the percentage found by González-García *et al*¹² who reported that 55.1% of reconciliation errors required the participation of a pharmacist for their resolution in the Orthopaedic Surgery and Traumatology Department and the Angiology and Vascular Surgery Department. This could be explained by the greater experience medical specialists have with chronic medication compared with surgeons.

According to the systematic review of Campbell *et al*,¹³ medication omission is the most common type of error with a frequency of 40% to 70%. Our series confirms these data, highlighting the frequency of this type of error far above the rest. This could be explained by the lack of resources and time to perform medication reconciliation in a structured and correct manner that would enable the provision of a complete and updated list of the patient's medication.

The most common PI performed was the therapeutic interchange of home medication based on the hospital's Pharmacotherapeutic Guidelines. This coincides with the findings of previous studies analysing the impact of the presence of CP in the ED.¹⁴

The impact of our interventions has not been evaluated in the study. However, there are publications of similar methodology where reconciliation achieves a significant improvement in patient safety and an economic benefit.¹⁵

As a limitation of this study, it should be mentioned that it may not accurately reflect the reality of emergencies pharmacists due to the few hours of daily activity in the ED, so increasing this activity could have a positive impact on morbidity, since it would allow the review of the medication of more patients.¹⁶

In conclusion, this study shows that the inclusion of a CP in the ED team increases the detection of potentially harmful medication reconciliation errors. In addition, in collaboration with the physician, the pharmacist's interventions help to resolve medication errors.

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critically for important intellectual content, all of these have approved the final version to be submitted and MAPM has submitted the manuscript.

Competing interests None declared.

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