

Prospective study to explore the impact of a clinical pharmacist in a cardiac surgical population or after acute coronary syndrome.

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Background

Patients in intensive care unit (ICU) are at risk of medication errors (polypharmacy, critical nature of their illnesses and use of high-risk drugs). Collaboration with a clinical pharmacist can be helpful to minimize the risks. In order to develop and sustain clinical pharmacy activity on the ICU at our hospital, formal evaluation of the potential benefit was required.

Purpose

To describe the characteristics of interventions performed by an ICU clinical pharmacist, including their clinical relevance and likelihood to prevent adverse drug events (ADEs), as well as to carry out a cost analysis on a subgroup of critical interventions.

Method

A prospective interventional study was conducted in the cardiac and cardio-surgical ICU of a teaching university hospital. The clinical pharmacist provided pharmaceutical care to cardiovascular surgical and acute coronary syndrome ICU patients over a 9 week-period. All clinical pharmacy interventions (CPIs) were recorded and evaluated by two independent evaluators for clinical relevance and likelihood to prevent ADEs. The CPIs were categorized in a risk classification system adapted from the Society of Hospital Pharmacists of Australia. The type of data required to perform the intervention were also collected. For the costing analysis, we relied on German adverse drug events micro-costing data by Rottenkolber et al.

Table 1 : Risk classification of pharmacy interventions using a probability matrix adapted from Journal of Pharmacy Practice & Research

| | | Clinical relevance | | |
|--------------------------|-------------|----------------------|----------|-------|
| | | Insignificant /minor | Moderate | Major |
| Likelihood of occurrence | Almost sure | H1 | E1 | E3 |
| | Possible | L2 | H2 | E2 |
| | Rare | L1 | M | H3 |

E = extreme risk ; H = high risk ; M = moderate risk ; L = low risk

Références :

- Chapter 13. Documenting clinical activities, Journal of Pharmacy Practice and Research Volume 43, N°2 (suppl.). 2013. http://jppr.shpa.org.au/lib/pdf/2013_06_suppl/S42-S46_Chapter13-ro.pdf.
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Results

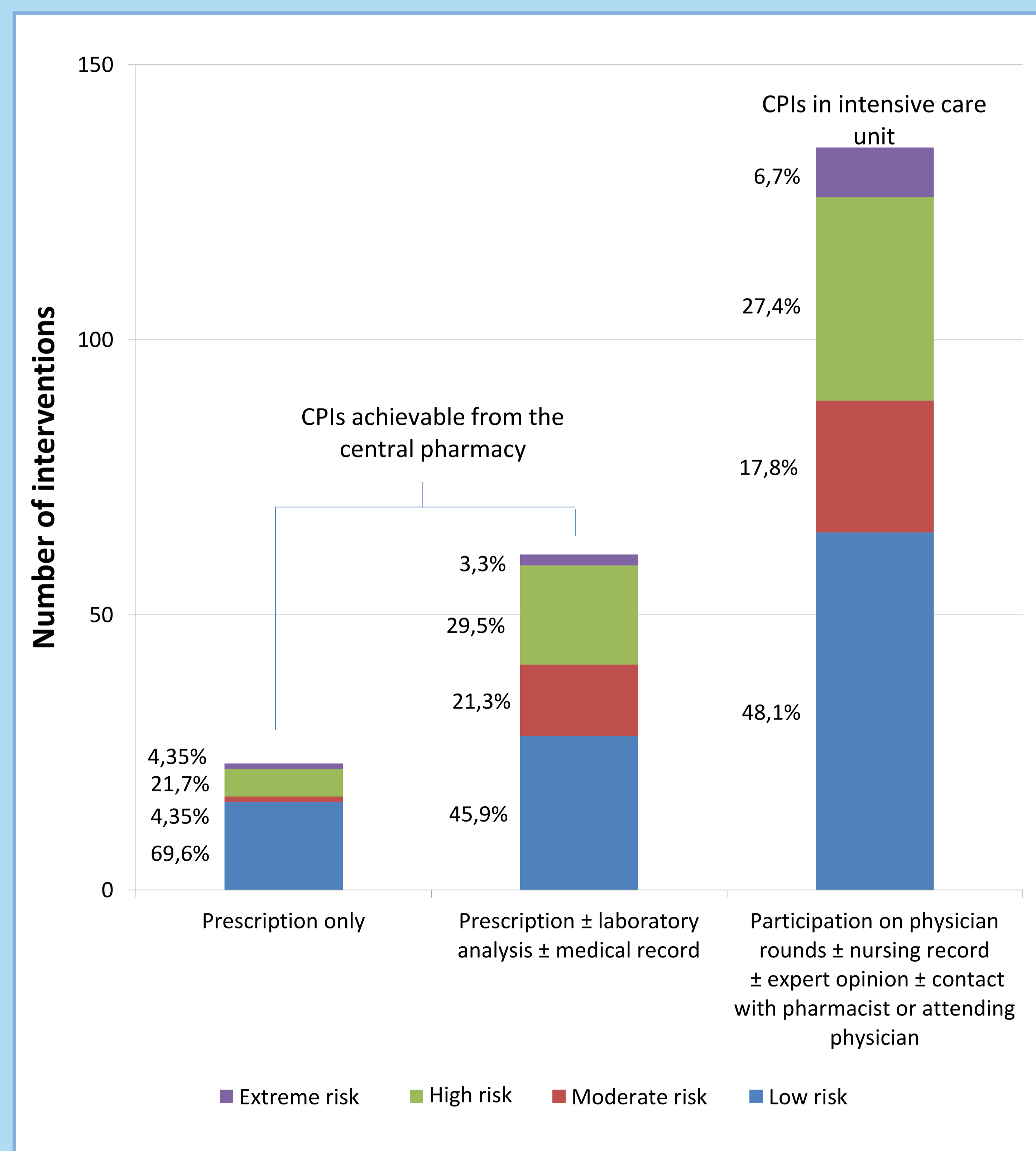
A total of 230 CPIs were performed in 58 patients. The acceptance rate was 85.5%.

The medication classes most frequently involved were: blood and coagulation (16.9%), cardiovascular system (14.8%), pain and fever drugs (14.8%). Sixty-six (33.8%) interventions were considered high/extreme risk, and anticoagulants and antiplatelet agents alone accounted for 25.8% of those.

Table 2 : Types of medications related to medication errors

| | Low and moderate risks n = 130 (%) | High and extreme risks n = 66 (%) |
|--|---------------------------------------|--------------------------------------|
| Anticoagulants (24) | 14 (10.8) | 10 (15.2) |
| Lipid-lowering therapy (18) | 15 (11.6) | 3 (4.5) |
| Hypnotics, sedatives and anxiolytics (17) | 13 (10) | 4 (6.1) |
| Gastric and duodenal pathology (17) | 15 (11.6) | 2 (3) |
| Analgesics - Antipyretics (paracetamol,...) (16) | 12 (9.2) | 4 (6.1) |
| Vitamins (15) | 12 (9.2) | 3 (4.5) |
| Opioids (13) | 9 (6.9) | 4 (6.1) |
| Antiplatelet agents (9) | 2 (1.5) | 7 (10.6) |
| Others (67) | 38 (29.2) | 29 (43.9) |

Figure 1 : Sources of information needed to perform risk-based CPIs



The cut-off to cover the wage of the clinical pharmacist could be reached, if 24 severe adverse events on anticoagulants and antiplatelet agents were avoided per 7 weeks. Two third of all CPIs required the presence of the pharmacist in the unit. Analysis of the medical record (45.1%) and contact with a primary care provider (46.7%) were proportionally the sources of information most often used in case of high/extreme CPIs.

Conclusion

This study provides data that support the expansion of clinical pharmacy services to cardiovascular surgical patients in ICU.