Background

Potassium (K+) is the principal intracellular cation and is essential to maintain the function of multiple organs. It is a critical component of cardiac conduction and has a narrow therapeutic/toxic range.

Purpose

To investigate the effect of pharmaceutical intervention through computerised prescription order entry (CPOE) in hospitalised patients with K+ disorders.

Materials and Methods

Prospective study carried out over 7 weeks. Pharmacists first added information about drugs that affect the K+ level as a support in the prescription programme. We then identified patients with abnormal K+ levels using a link with laboratory data (<3.1 and >5.3 mmol/l). Pharmacists reviewed the pharmacotherapy daily in order to detect possible medication errors related to K+ disorders. Lastly we analysed the effect of pharmaceutical recommendations and physician acceptance rate.

Results

183 patients were included (67 ± 17 years old on average), 128 patients (69.9%) with hypokalaemia and 55 (30.1%) with hyperkalaemia. A total of 3,380 electronic prescriptions were selected. Of them, 540 (16.0%) could affect K+ levels mainly through furosemide, piperacillin-tazobactam and meropenem; pharmacists checked 383 orders thoroughly to prevent possible medication errors. 232 (60.6%) required pharmaceutical recommendations, 130 of them (56.0%) were related to optimising K+ therapy in hypokalaemic patients and 35 (15.0%) were safety recommendations for closer monitoring. Clinicians accepted 72.4% of recommendations.

Conclusions

There is a high rate of prescription errors related to K+ disorders that could jeopardise patient safety. Pharmaceutical intervention through CPOE helps to minimise them and increases physician awareness of the necessity of closer K+ monitoring in these patients.

No conflict of interest.

Among the severe potential interactions we highlighted the following risks:

- 20% involved an increase in the risk of haemorrhage (enoxaparin-acetylsalicylic acid, enoxaparin-acenocoumarol),
- 23% involved a prolonged QT interval (quetiapine-haloperidol and quetiapine-citalopram),
- 37% involved a serotoninergic syndrome (due to the association of an opioid analgesic with a selective serotonin reuptake inhibitor),
- 6% involved rhabdomyolysis: simvastatin-risperidone, simvastatin-amlodipine.

Conclusions

Due to the high incidence of potential DDIs, the pharmacist should play two key roles when facing a potential interaction: if possible, suggest an alternative with the same therapeutic profile, but without the interaction risk; or evaluate the benefit/risk balance and if it is worth taking the risk, monitor the patient closely and warn the rest of the medical staff.

No conflict of interest.