Co-prescription of simvastatin and potent inhibitors of CYP3A4; monitoring system in hospital

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Background

Drug-drug interactions may increase the risk of adverse events. Understanding the pharmacokinetic and pharmacodynamic properties of drugs and their interaction mechanisms is fundamental to optimize therapeutic results. However, the multiple pharmacological interactions and its relevance are not easy to manage in clinical practice. The benefits of statins, in the treatment and prevention of cardiovascular disease, are well documented. While overall safe, statins produce a wide array of adverse effects that are known to be potentiated by certain drug interactions. Concomitant use of simvastatin with a potent CYP3A4 inhibitor (inCYP3A4) is considered a clinically significant pharmacokinetic interaction, and therefore this combination is contraindicated.

Purpose

The aim of this study was to evaluate the efficacy of a recently implemented security alerts system in reducing the prevalence of co-prescription of simvastatin and inCYP3A4.

Methods

After an extensive bibliographic review of the drug interaction classifications, a computerized system was implemented to alert for the risk of co-prescription of simvastatin and inCYP3A4 (Atazanavir; Boceprevir; Cyclosporine; Clarithromycin; Darunavir; Erythromycin; Fosamprenavir; Indinavir; Itraconazole; Lopinavir-Ritonavir; Posaconazole; Ritonavir; Saquinavir; Telaprevir; Tipranavir). All patients with prescription for simvastatin, admitted to Centro Hospitalar de Lisboa Ocidental between January 2013 and January 2014, were included. The information on prescriptions for simvastatin and inCYP3A4 was collected by consulting Pharmaceutical Services’ records. Co-prescription prevalence rates were assessed six month before and six month after safety alerts implementation.

Results

The study included 6326 patients: 3370 patients (53.6% male, mean age 76.5±11.1 [40-103] years) were included in pre-implementation phase (PEP) and 2956 patients (48.8% male, mean age 77±12.6 [55-93] years) in post-implementation phase (POP).

Co-prescription was identified in 224 patients in PEP and 41 patients, in POP. Co-prescription rates in PEP and POP were 6.6% and 1.4% respectively, which represents an 5.2% reduction.

Discussion/Conclusion

The prevalence of simvastatin and inCYP3A4 co-prescription significantly decreased with the implementation of a system that alerts for the increased risk of simvastatin adverse effects. The co-prescription period also decreased with the safety alerts implementation. The clinical risk management and the maintenance or suspension of the co-prescription is a medical decision, which may explain these results.

The security alerts system implemented seems to be an effective strategy in reducing incidence of simvastatin and inCYP3A4 co-prescription, and therefore may increase patient safety in hospital.

References


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