Community pharmacy reports of potential QTc-prolonging drug-interactions involving fluoroquinolones or macrolides: A multi-incident analysis

Roshan Tahavori, Certina Ho
ISMP Canada & Leslie Dan Faculty of Pharmacy, University of Toronto, Toronto, Ontario, Canada

Background

- Although fluoroquinolones and macrolides only have a moderate QTc-prolonging potential, they are in widespread use and hence have the potential for being implicated in relatively high number of QTc-related drug-interaction incidents.
- Fluoroquinolones and macrolides represent 28% of drug-induced torsades de pointes (TdP) cases reported in the literature. Furthermore, 70-80% of QTc-prolongations involving these antibiotics have led to TdP, and 10% have caused death.[1]

Objective

- To analyze incidents of potential QTc-prolonging drug interactions involving fluoroquinolones and macrolides, and provide system-based recommendations in order to fill in patient-safety gaps.

Method

Searched ISMP Canada Community Pharmacy Incident Reporting (CPhIR)[2] Database

QTc-related incidents involving fluoroquinolones and macrolides between April 2010 and January 2015

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Selected incidents for final analysis

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Identified themes and potential contributing factors

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Provided recommendations to fill in patient-safety gaps

Results

- 56 incidents selected for our analysis.
- Most incidents lacked a detailed description of the event, and were pharmacy-intercepted drug interactions (i.e. near misses).
- Most commonly reported antibiotics were *moxifloxacin, ciprofloxacin, clarithromycin,* and *azithromycin*.
- Commonly reported classes of interacting drugs were *antidepressants, antiarrhythmics,* and *antipsychotics*.
- 3 main themes and corresponding potential contributing factors were identified (**Table 1**).

Themes	Potential Contributing Factors
Prescriber-triggered potential for QTc-prolongation	Lack of drug-interaction assessment while prescribing
Potentially inappropriate pharmacist-intervention	Lack of patient assessment when intervening on the drug-interaction
Patient-potentiated risk for harm	Visiting Multiple Prescribers and Pharmacies

Table 1. Main themes and potential contributing factors.

Conclusions

Implications

1. Most prescribers do not seem to assess for drug interactions capable of causing QTc-prolongation when prescribing fluoroquinolones or macrolide either because they are unaware of the interaction (i.e. inadequate knowledge) or they do not have the complete history on the patient (i.e. inadequate patient information) to detect the interaction.
2. Most pharmacists seem to intervene without assessing the patient's risk of QTc-prolongation and TdP. This is a problem since susceptibility to QTc-prolongation and potential for developing TdP depends greatly on the number and type of risk factors. In fact, about 90% of drug interaction-induced TdP occur in patients with ≥ 1 risk factor, and 74% of cases have ≥ 2 risk factors.[1]
3. Visiting multiple prescribers and/or pharmacies may widen safety gaps as patients often do not disclose a complete and up-to-date medication list and medical history to each healthcare provider. This is likely because patients do not adequately appreciate the potential harm associated with these practices.

Recommendations

1. Prescribers should attempt to regularly collect or access a medication list and past medical history, and make TdP risk-assessment when prescribing drugs with QTc-liability. We developed the ***QTc-Prolongation Risk Factors Checklist*** (available upon request) to facilitate this assessment.
2. Pharmacists should assess the patient before intervening on the drug interaction to ensure the risk of QTc-prolongation and TdP is significant. This prevents withholding therapy that would otherwise be beneficial and most likely not harmful. We developed the ***QTc-Prolongation Risk Factors Checklist*** (available upon request) to facilitate this assessment.
3. Pharmacists should educate their patients about the potential risks of visiting multiple prescribers and/or pharmacies, and regularly provide them with updated medication list to mitigate potential harm from these practices.

Limitations

- Possibility of bias due to voluntary incident reporting nature of the CPhIR[2] Database.
- Questionable quality of data due to paucity of incident-description details

References:
1. Abo-Salem E, et al. Antibiotic-induced cardiac arrhythmias. *Cardiovasc Ther* 2014 Feb;32(1):19-25.
2. ISMP Canada. Community Pharmacy Incident Reporting (CPhIR) Database. http://www.cphir.ca.

Acknowledgements:
The authors would like to acknowledge the support from the Ontario Ministry of Health and Long-Term Care for the development of the CPhIR program. CPhIR contributes to the Canadian Medication Incident Reporting and Prevention System (http://www.ismp-canada.org/cmirps/index.htm).