Medication Incidents Associated with Patients with Renal Impairment: A Multi-Incident Analysis

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Objectives

- Medication incidents associated with patients with renal impairment may result in increased exposure to medications, putting patients at risk of side effects, serious harm, or death.
- The objective of this multi-incident analysis was to gain a deeper understanding of the possible contributing factors to incidents associated with patients with renal impairment and to develop potential recommendations to prevent error recurrences.

Methodology

- A total of 172 medication incidents associated with patients with renal impairment were extracted from the Institute for Safe Medication Practices Canada (ISMP Canada) Community Pharmacy Incident Reporting (CPhIR) Program from June 2014 to May 2019.
- Following exclusion criteria, we conducted a qualitative, thematic analysis on 134 incidents, and provided recommendations to address patient safety gaps corresponding to these incidents.

Results

- We identified three main themes from this multi-incident analysis (Tables 1-3).
- We offered recommendations to pharmacists and prescribers (Table 4).

Conclusion

- Access to patient diagnostic test results (e.g. lab values) should be available to all healthcare professionals.
- Healthcare practitioners are encouraged to remind patients to share with them if they have any changes to their medical conditions or medications and if they have had any recent blood work done.
- Recommend patients to use the *5 Questions to Ask About Your Medications* handout where they can learn about common questions that they should ask their healthcare providers regarding their medications at each encounter.
- We hope our findings from this multi-incident analysis can provide a platform for reflection and shared learning.

Table 1. Main Theme 1 – Recognition of Renal Impairment

Subtheme 1 – Checking/Availability of Lab Values

Incident Example:
Physician gave Nitrofurantoin to a patient without checking their CrCl, which was very low. Patient's renal function was checked by the pharmacist when filling prescriptions and medication was changed to something more appropriate.

Contributing Factors:
- Lab values unavailable to healthcare practitioners
- Lab values available to practitioners, but not checked

Commentary:
Healthcare providers should always check or obtain lab values whenever high-alert medications are ordered/dispensed for patients with renal impairment.

Subtheme 2 – Patient-Related Factors

Incident Examples:
- Physician gave patient Metoclopramide 10 mg QID. Based on a conversation with the patient, we discovered their renal function has been decreased, therefore patient requires a dosage reduction. Contacted the physician and explained the situation. Physician stated to decrease the dose to 5 mg QID.
- A prescription was phoned in from the physician for Amoxicillin/Clavulanic acid 875 mg twice daily. Pharmacy knew the patient has renal function issues, so they called the kidney clinic. Patient had a CrCl of 16 mL/min, which means dose should be reduced to 250 to 500 mg twice daily. Pharmacy faxed physician and had dose changed.

Mitigating Factors / Best Practice in Preventing Medication Harm:
- Medical conditions discussed during patient counselling
- Practitioner familiarity with patient
- Recognizing patients with increased risk of having renal impairment
- Interprofessional collaboration within the circle of care

Commentary:
The familiarity that comes with longstanding patient-provider relationships can draw attention to inappropriate medication prescribing. This includes medications, which have not been dose-adjusted being prescribed to patients with renal impairment.

Subtheme 3 – Drug-Related Factors

Incident Examples:
- Prescription was written for Trimethoprim-Sulfamethoxazole DS once daily PO x 7 days. Prescription was filled as Trimethoprim-Sulfamethoxazole DS 800/160 mg - take one tablet by mouth twice daily for 7 days, dispense 14 tablets. Pharmacist caught error when checking prescription. Trimethoprim-Sulfamethoxazole DS is normally dispensed BID, but due to the patient's poor renal function, the physician decided to give DS dosing once daily as opposed to single strength dosing BID.
- Physician wanted to prescribe Rivaroxaban for a patient but had not ordered a renal panel. We phoned the physician about checking patient's kidney function first. Renal panel came back and the dose had to be adjusted from 20 mg daily to 15 mg daily.

Mitigating Factors / Best Practice in Preventing Medication Harm:
- Pharmacist's recognition of atypical medication dosing
- Pharmacist's recognition of high-alert medications in renal impairment

Commentary:
Pharmacists, as medication therapy experts, play a key role in recognizing atypical medication dosing and high-alert medications.

Subtheme 4 – Documentation and Computerization

Incident Examples:
- Pharmacy had patient's medical conditions documented in patient profile; we knew patient had severe kidney dysfunction and should not be on that dose for that duration. We called physician and discovered that the wrong dose had been ordered; dose was ordered for 3 months instead of 3 days.
- The computer system picked up an interaction with Levofloxacin and the patient's medical condition, renal failure.

Mitigating Factors / Best Practice in Preventing Medication Harm:
- Documentation of patient's renal status
- Presence of computer alerts/prompts regarding patient's renal status

Commentary:
Computer system alerts can prompt providers to recognize potentially inappropriate drug therapy (e.g. drug-disease interaction alerts, dosage warnings).

Table 2. Main Theme 2 – Additional Safeguards for Patients with Renal Impairment

Subtheme 1 – Additional Renal-Specific Care Providers

Incident Example:
A prescription for the patient was written for one tablet twice a day. The patient requires blister packs and previously had received one tablet twice a day on non-dialysis days: Tuesday, Thursday and Saturday. However, the dose was changed to one tablet twice a day everyday. The patient went to the dialysis unit at the hospital and the pharmacist noticed that Candesartan was missing on dialysis days. The hospital pharmacist contacted the community pharmacy and corrections were made.

Mitigating Factors / Best Practice in Preventing Medication Harm:
- Disease specific knowledge and experience
- Presence of an independent double check

Commentary:
Patients being monitored by specialized care providers (e.g. renal pharmacists and nephrologists) have an additional safeguard against the inappropriate use of highly specialized medications. The use of medication reconciliation processes is recommended to detect and resolve potential medication incidents.

Subtheme 2 – Additional Education Provided to Renal Patients

Incident Examples:
Patient was counselled by both the physician and pharmacist to take only one tablet BID due to their decreased kidney function. Upon opening the prescription bag at home, the patient discovered the label said take one tablet QID and the quantity was double what it should have been. Patient contacted pharmacy at once.

Mitigating Factors / Best Practice in Preventing Medication Harm:
- Care providers communicate dosing changes/rationale to patient
- Patient knowledge of drug therapy/disease state

Commentary:
- Communication of drug dosing changes/rationale to the patient and providers within the circle of care is highly recommended.
- Patients with renal impairment often receive additional education regarding their medication therapy and disease state. These discussions empower patients to detect near misses or medication errors and act as an independent double check of their medication therapies.

Table 3. Main Theme 3 – Additional Risk Introduced by Renal Impairment

Subtheme 1 – Dialysis

Incident Examples:
- Metoprolol was supposed to be placed in blister packaging except for the dialysis days. Medication was placed in the wrong slot in compliance packaging. Pharmacist noticed mistake when checking packages and mistake was corrected.
- Prescription was misinterpreted - Cephalexin 500 mg PO daily (give after dialysis on Tuesday / Thursday / Saturday) x 2 weeks. Medication was filled as "dispense 6 tablets for the 3 days of the week indicated x 2 weeks". Patient phoned back and explained that the medication is supposed to be taken every day for 14 days (i.e. after dialysis on the indicated days of the week, so that the medication would not be dialyzed and removed from the patient).

Contributing Factors:
- Ambiguity of prescriptions/lack of indicated changes in therapy
- Lack of independent double checks

Commentary:
- Dialysis introduces several additional risks to patient, one of which is potential medication incidents due to scheduling complexities.

Subtheme 2 – Drug Therapy Changes Relating to Renal Function

Incident Example:
After packaging, the clinical check found the dosing frequency of Valacyclovir to be inappropriate for the patient's renal function. The order was re-processed and counted, but the original label was not changed and still reflected the incorrect dosing frequency.

Contributing Factors:
- Lack of appropriate follow-up to drug therapy changes

Commentary:
- Drug therapy changes related to patient's renal function should always be documented and followed up properly throughout the medication-use process.

Table 4. Summary of Recommendations

- Ask patients about changes to their medical/medication history at every visit. Document changes prominently in the patient profile
- Recognize populations at high risk for renal impairment, for example, the elderly, patients under the care of renal specialists (e.g., nephrologists, renal clinics) and patients with hypertension and/or diabetes
- Lab values, if available, should be consulted when prescribing and evaluating medication therapy
- Practitioners should recognize and exercise caution with high-alert medications in renal impairment. (Refer to the Ontario Renal Network (https://www.ontariorenalnetwork.ca/en/medicationsafety) and other resources as appropriate to confirm dose adjustments or contraindications in renal impairment.)
- When prescribing, recommending, or evaluating medication therapy, consider the potential for drug-disease interactions

For Pharmacists

- Atypical medication dosing may signify that a patient has renal impairment. Unfamiliar medication dosing should be investigated to discover the rationale
- If there is uncertainty surrounding a patient's degree of renal impairment, contact the patient or prescriber as appropriate to confirm renal status
- Utilize pharmacist's expanded scope of practice (as permitted by provincial legislation) to adapt prescriptions as appropriate, including for patients with renal impairment.
- Implement a checklist of measures to take when adapting drug therapy (e.g. change SIG, adjust quantity, inform prescriber, inform patient, document changes, etc.)
- Consider implementing an independent double check system for medications prescribed to patients receiving dialysis
- Discuss patient medical conditions during counselling (for both prescription and non-prescription medications)

For Prescribers

- Regularly monitor patients' renal function and communicate relevant changes to the patient and the patient's care team
- Include relevant lab values (e.g. CrCl, INR, A1C, etc.) on prescriptions to allow pharmacists to independently assess the appropriateness of drug therapy
- Clearly indicate changes in therapy and supporting rationale on prescriptions

References: Available upon request

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 (CMIRPS) (https://www.cmirps-scdpim.ca/).

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Disclosures: Authors of this poster have the following to disclose concerning possible personal or financial relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation:
- Grant Fuller – Nothing to disclose
- Kendra Carroll – Nothing to disclose
- Alan Li – Nothing to disclose
- Certina Ho – Nothing to disclose