Addressing Medication Errors in HIV-Positive Inpatients: A Clinician’s Guide to Assessing Antiretroviral Therapy

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Objectives

• To describe the types of errors reported in the literature for HIV inpatients

• To introduce the Antiretroviral Assessment Guide for Hospital Pharmacists
Project Background

• PharmD Elective: Hybrid HIV clinical/research experience
• Clinical component at Northern Alberta Program, Royal Alexandra Hospital
• Opportunity to complete research project in area of interest
• Students interested in a hospital-based project that would enhance clinical practice
• Opportunity to update and refine a previous ARV project for inpatient pharmacists developed 8 years ago
Project Development

• Objective:
  – To address the issue of drug error in HIV inpatients through the development of an assessment guide for clinicians who provide care for HIV positive patients, using an evidence-based approach

• Project was split into two phases:
  – Comprehensive Literature Review
  – Assessment Guide for Clinicians
Phase 1:

Antiretroviral and Medication Errors in Hospitalized HIV-Positive Patients: A Review of the Literature

Li E, Foisy M. Ann Pharmacother 2014;48:998-1010.
Background

- HIV now considered a chronic condition
- 26 drugs in 6 drug classes; new medications under study
- ARV regimens are complex and require a high degree of adherence
- HIV patients can be complex
- Transitions of care are prone to medication error
- **Potential consequences of drug error include:** Viral Resistance, ARV Treatment Failure, and ARV Toxicity
Objectives

• To characterize the rates and types of drug errors that are occurring in the hospital setting

• Explore potential solutions that have been studied to minimize drug error in this population
Methods

Guidelines: DHHS\(^1\), EACS\(^2\), BHIVA\(^3\), 2012 Canadian Clinical Practice Guidelines for HIV Pharmacists\(^4\)

Results

• Variable but generally HIGH rate of errors
• 5.8% to 86% of patients admitted experienced ≥ 1 medication error

Most Common Errors (mostly with ARVs):

#1: Initial Regimen Errors
#2: Dosing Errors
#3: Drug-Drug interactions
Regimen Errors

- Entire ARV regimen omitted
- One or more components of 3-drug regimen omitted
- Example: tenofovir not prescribed on admission; darunavir/ritonavir continued
- Consequences: incomplete dosing may cause drug resistance and HIV treatment failure
Dosing Errors

- Incorrect number of tablets/capsules ordered
- Incorrect frequency (BID instead of TID)
- Duplication of doses
- Incorrect dose ordered
- Failure to adjust dosing time for dialysis

**Examples:**
- RAL 1 tab PO daily prescribed instead of BID
- Infant received 7.6mL AZT syrup instead of 0.76mL
- Patient in ARF, Combivir (AZT/3TC) held but not restarted, IDV continued for 4 days
Drug/Drug, Drug/Food Interactions

- Atazanavir requires acid for absorption – commonly interacted with PPIs, H2RAs, antacids
- CYP450 3A4 inhibited by protease inhibitors – numerous drug interactions (eg. statins, corticosteroids, opioids)
- Some ARVs require co-administration with food
Possible Solutions?

• HCP interview- lack of knowledge (71%), failure to reconcile home meds (25%) as top reasons for error\(^1\)

• Most successful intervention study (72% to 15% in 7 months) involved CPOE revisions, educational pocket cards, med rec and daily review by ID specialized pharmacist\(^2\)

\(^2\)Daniels et al. AJHP 2012;69:422-430)
Conclusions

• Very high rates of drug error in HIV patients
• Errors in ARV regimen, dosing, scheduling, drug interactions most common
• Drug error at time of prescribing, dispensing, unit transfer and discharge
• Also watch for complete ARV omission
• Errors are multi-factorial and require multi-pronged solutions
Phase 2:

Development of the Antiretroviral Assessment Guide

Pittman E, Foisy M.
Objective

• To address common types of ARV errors
• Creating a guide for clinicians that provides:
  – a framework for patient assessment
  – a collection of useful resources to facilitate clinical decisions and minimize drug-related errors

GOAL:

To minimize ARV drug errors in HIV patients
Methods

• Evidence-based guide based on results in Phase 1
• Involved PharmD students and HIV pharmacist
• Assessment process adapted from UofA Patient Care Assessment Framework¹
• Two peer reviews- HIV pharmacists, including a SAC HIV pharmacist, and several CPLs

¹http://pharm.ualberta.ca/preceptors/training-and-resources/patient-care-process-module
Results

- 17-page guide
- A 3-step patient assessment process was developed, with HIV-specific content supporting each section
- Supplementary material was included in the appendices to increase the utility of the guide
Results

• The 3-step assessment process followed the path a patient would take during the course of hospitalization:
  1. Admission Assessment
     • Tx Indicated? Tx Effective?
     • Tx Safe? Adherence?
  2. Assessment During Internal Transfer
  3. Discharge Assessment
Results

- Supplementary appendices included information on:
  - Laboratory tests
  - Drug interactions
  - ARV agents
  - Additional resources
  - Important provincial contact information
- Companion ARV assessment form developed
Where to find it...

• Guide posted on AHS pharmacy sites
  – Sharepoint- Clinical Practice- Clinical Practice Tools- HIV- HIV ARV Assessment Guide
Conclusion

• An evidence-based clinical guide for the assessment of HIV pharmacotherapy for inpatients was developed for non-HIV clinicians
• The guide is adaptable to various institutions and practice settings
• Implementation of the guide is underway - dissemination, medical/pharmacy education, focus group discussions, feedback welcome
• Further study is required to assess the use and impact of the guide
More Information...

• Upcoming HIV Grand Rounds Presentation
• Oct 22, 1:00 – 2:30 pm
• Will address finer details of the project:
  – Review of ARV drug errors in this patient population
  – Patient assessment process outlined in the guide
  – Supplementary appendices included in the guide
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Questions