Adverse Drug Events and Medication Safety: Diabetes Agents and Hypoglycemia

Date: October 20, 2015

Presented by
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Pharmacy Interventions, Technical Lead
Objectives: Today’s Topics

► Overview of Adverse Drug Events and the National Action Plan for ADE Prevention

► High Risk Drug Classes and ADEs: The Big 3

► Deeper Dive: Diabetes Agents and Hypoglycemia
Medication Safety: Management & Prevention of Drug-related Harm

**ADE:**
Injury resulting from the use of a drug

**Adverse Drug Reaction (ADR):**
Harm directly caused by a drug at normal doses, during normal use (e.g., side effects)

**Medication Error:**
A preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of a healthcare professional, patient or consumer

**pADE:**
Medication errors that are stopped before harm can occur, i.e., near misses

Source:
http://www.nccmerp.org/aboutMedErrors
http://www.pbm.va.gov/vamedsafe/Adverse%20Drug%20Reaction.pdf

Medication Therapy Intervention & Safety Documentation Form.
User Manual (v 7.0, updated 4/6/12). Steven Chen, PharmD, USC School of Pharmacy.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication Error</td>
<td>An inappropriate use of a drug that may or may not cause harm (all are considered preventable)</td>
<td>Incorrect dose selection, dosing at wrong time of day, dose omission, duplicate therapy, etc</td>
</tr>
<tr>
<td>Potential Adverse Drug Event (pADE)</td>
<td>A medication error with the potential to result in an ADE detected before reaching a patient</td>
<td>Long-acting sulfonylurea (glyburide) ordered for patient over 65 years old, pharmacist calls prescriber to change</td>
</tr>
<tr>
<td>Adverse Drug Event (ADE)</td>
<td>INJURY resulting from medical intervention related to a drug</td>
<td>Hypoglycemia resulting from glyburide use</td>
</tr>
<tr>
<td>Adverse Drug Reaction</td>
<td>Harm directly caused by a drug at usual doses</td>
<td>Allergic reaction to glyburide in patient with ‘sulfa’ allergy</td>
</tr>
</tbody>
</table>
Medical and Medication Errors

► 1999 Institute of Medicine (IOM) report:
  – To Err is Human:
    44,000–98,000 people/year die as a direct result of medical errors

► 2006 IOM report
  – Preventing Medication Errors
    1.5 million preventable ADEs annually in the United States. Each costs ~$8,750
Adverse Drug Events and Readmissions

- 20% patients with Medicare are readmitted within 30 days of hospital discharge
- 35% within 90 days
- 17 billion dollars annually (~$9600/readmission)
- Adverse Drug Events (ADEs) implicated in ~7000 deaths annually
- Compared to inpatients, little data is available on ADEs for patients post discharge

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ALL Medical Errors
Where is the Most Opportunity for Improvement?

  - 100,000 emergency hospitalizations annually for patients 65 years and older
  - Warfarin 46.2% of Emergency Department (ED) visits resulting in hospitalization
  - Insulins 40.6%
  - Oral Hypoglycemic Agents 51.8%
  - Opioid 32.4%
ALL Medical Errors

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Common, Preventable ADEs:
- Anticoagulants
- Diabetes Agents
- Opioids
The National Action Plan for Adverse Drug Event Prevention

► U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion, July 2014

► Modeled after National Action Plan to Prevent Healthcare-Associated Infections

► Defines a framework for government and non-government agencies to coordinate efforts to reduce the health burden of ADEs
National Action Plan

- Big 3 Medication Classes
  - Anticoagulants
  - Diabetes Agents
  - Opioids

- Improvement Strategies
  - Surveillance
  - Prevention
  - Incentives & Oversight
  - Research

CMS QIO Program

- Big 3 Medication Classes
  - Anticoagulants
  - Diabetes Agents
  - Opioids

- Improvement Strategies
  - Screening
  - Interventions
  - Recruit, Train, Share
  - Find and Use Data
Significant ADEs for the Big 3

- Anticoagulants: Bleeding Events
- Diabetes Agents: Hypoglycemia
- Opioids: Respiratory Depression and Excessive Sedation
Adverse Drug Events are responsible for which of the following

- A. Over 3.5 million physician office visits
- B. Over 1 million ED visits
- C. Over 125,000 hospital admissions
- D. Largest contributor to hospital complications
- E. All of the above
Which group of people are at highest risk for ADEs?

- A. Children under 16
- B. Women of childbearing age
- C. Health workers
- D. Adults over 65
Which group of people are at highest risk for ADEs?

- Children under 16
- Women of childbearing age
- Health workers
- Adults over 65
  - Older adults are 2 to 3 times more likely to have an ADE requiring physician or ED visit and 7 times more likely to require hospitalization
Other populations at risk for ADE

- Low socioeconomic status
- Limited health literacy
- Limited access to health care services
- Minority racial and ethnic groups
- Others?
What are the 3 priority drug classes identified in the ADE-NAP

- A. Anti-inflammatory agents, antihypertensives and opioids
- B. Antibiotics, diabetes agents and opioids
- C. Anti-inflammatory agents, antibiotics and anticoagulants
- D. Anticoagulants, opioids and diabetes agents
- E. Antibiotics, diabetes agents and anticoagulants
What is the primary ADE of concern with diabetes agents?

► A. Hyperglycemia
► B. Hypoglycemia
► C. Diabetic Ketoacidosis
► D. Lactic Acidosis
► E. Urinary Tract Infection
Diabetes: Balancing Blood Sugar Control and Hypoglycemia

Reduce elevated blood sugars

Avoid low blood sugars
What is the target A1c for patients with diabetes?

- A. Less than 8%
- B. Less than 7%
- C. Less than 6.5%
- D. Between 6 and 8%
- E. None of the above
What is the target A1c for patients with diabetes?

- Less than 8%
- Less than 7%
- Less than 6.5%
- Between 6 and 8%
- None of the above - New guidelines suggest target goals should be individualized and based on patients' risk factors for hypoglycemia and likely benefit from tight control
Summary Chart for Individualized Glycemic Goals

<table>
<thead>
<tr>
<th>Psychosocioeconomic considerations</th>
<th>Most Intensive</th>
<th>Less Intensive</th>
<th>Least Intensive</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Few</td>
<td></td>
<td>Many</td>
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<table>
<thead>
<tr>
<th>Hypoglycemic risk</th>
</tr>
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<tbody>
<tr>
<td>Low</td>
</tr>
<tr>
<td>Moderate</td>
</tr>
<tr>
<td>High</td>
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<table>
<thead>
<tr>
<th>Patient age, y</th>
<th>40</th>
<th>45</th>
<th>50</th>
<th>55</th>
<th>60</th>
<th>65</th>
<th>70</th>
<th>75</th>
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<thead>
<tr>
<th>Disease duration, y</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
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<th>Other comorbid conditions</th>
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<tbody>
<tr>
<td>None</td>
</tr>
<tr>
<td>Few or mild</td>
</tr>
<tr>
<td>Multiple or severe</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Established vascular conditions</th>
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</thead>
<tbody>
<tr>
<td>None</td>
</tr>
<tr>
<td>Early microvascular</td>
</tr>
<tr>
<td>Advanced microvascular</td>
</tr>
<tr>
<td>Cardiovascular disease</td>
</tr>
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</table>
What are some of the serious complications that can result from hypoglycemia?
What are some of the serious complications that can result from hypoglycemia?

- Cardiac dysrhythmias
- Accidents and falls
- Dizziness
- Confusion
- Infections/Pneumonia
- Serious/permanent neurological deficit
- Death
What can we do about it?

► Patient education
  - Improve understanding of diabetes’ effect on blood sugar and blood sugar’s effect on the body
  - Know how and why to use medications

► Safer Prescribing
  - Simplify medication regimens and dosing
  - Avoid unsafe prescribing practices (sliding scale, sulfonylureas for older patients)
What can we do about it?

► Care Coordination
  - Reduce fragmented care and use one pharmacy
  - Reconcile medications and update comprehensive medication list at every transition

► Measurement and Intervention
  - Join the QIO in measuring ADE rates at your facility
  - Plan-D0-Study-Act: Implement and track interventions to improve medication safety
Making Health Care Better

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