Evaluation of Baseline QTc Interval and Azithromycin Prescriptions in an Academic Medical Center

Rachael Lee, MD,1 Allison Guyton PharmD1, Danielle Kunz RPh1, Craig Hoesley, MD1
1The University of Alabama at Birmingham

Introduction

- In 2011, it was estimated that 40.3 million outpatients received a prescription for azithromycin.
- Use of azithromycin for its anti-inflammatory and immunomodulatory effects in COPD, cystic fibrosis, and lung transplant recipient has increased significantly.
- Cardiac toxicity can occur with macrolide antibiotics and prolongation of the QT interval with subsequent torsades de pointes has been documented with azithromycin.
- In 2012, Ray et al published data showing a small but absolute increase in cardiovascular deaths, yet subsequent data has not illustrated an increased risk of death from cardiovascular causes.
- Azithromycin use within our hospital has increased substantially (Figure 1). We investigated the prescribing practices of azithromycin within our institution and potential for adverse cardiovascular risks.

Methods

- Single-Center. IRB approved medication usage evaluation
- Inclusion Criteria
  - patients > 19 years of age with length of stay >3d
  - October 2012; April 2013
- Data Collected
  - 100 patients randomly selected from 1,610 encounters
  - Demographics of study patients.
  - Inclusion Criteria
  - 21% with borderline
  - Charges for Telemetry (Table 3)

Results

- Seventy-six patients were prescribed 2 or more QTc prolonging medications
  - only 32 (42%) were monitored with telemetry.
  - 65% of patients had a baseline ECG performed within the past 6 months prior to azithromycin administration.
  - 12.5% were noted to have borderline QTc on admission
  - 12.5% had abnormal QTc on admission
  - In the medium risk category, 59.3% had a baseline ECG
  - 5.3% with borderline QTc
  - 35.7% with abnormal QTc
  - In the high risk category, 78.9% received a baseline ECG
  - 21% with borderline QTc
  - 31.6% with abnormal QTc.

Conclusions

- In a randomly selected cohort of patients receiving azithromycin therapy, 76% of patients were prescribed 2 or more QTc prolonging medications, with telemetry ordered only 42% of the time.
- Patients with higher number of QT prolonging medications prescribed are at higher risk of having QTc prolongation on azithromycin therapy, 76% of use was empiric, and 25% was anti-inflammatory use.

Data Collected

- Table 1: Demographics of study patients.
- Average length of stay was 9.7 days and average length of azithromycin therapy was 2.6 days. 79% of use was empiric, and 25% was anti-inflammatory use.

Table 1: Demographics of study patients.

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Patients with Baseline ECG</th>
<th>Borderline QTc</th>
<th>Abnormal QTc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (n = 24)</td>
<td>21 (87.5%)</td>
<td>16 (66.7%)</td>
<td>3 (12.5%)</td>
</tr>
<tr>
<td>Medium (n = 57)</td>
<td>2 (3.5%)</td>
<td>24 (42.5%)</td>
<td>11 (19.2%)</td>
</tr>
<tr>
<td>High (n = 19)</td>
<td>10 (52.6%)</td>
<td>15 (78.9%)</td>
<td>4 (21.0%)</td>
</tr>
</tbody>
</table>

Figure 1: Azithromycin use within our institution.

Table 2: Drugs identified as having major drug-drug interactions. There were 35 medications identified with an average overlap of therapy of 4.5 days.

<table>
<thead>
<tr>
<th>Drug-Drug Interactions in Randomized Patients</th>
<th>Amiodarone</th>
<th>Ciprofloxacin</th>
<th>Clarithromycin</th>
<th>Clindamycin</th>
<th>Erythromycin</th>
<th>Fluconazole</th>
<th>Guadapine</th>
<th>Haloperidol</th>
<th>Octreotide</th>
<th>Promethazine</th>
</tr>
</thead>
</table>

Table 3: Patients with baseline ECG evaluation. Patients were divided by risk: low (1 medication), medium risk (2-3 medications), and high (4 or more medications).

References