**Background**

- Allergies to penicillin and other classes of antibiotics are common.
- Alternative antibiotics are associated with increased patient morbidity, mortality, and economic costs.
- Rapid intravenous antibiotic desensitization (RIAD) is under-utilized method of overcoming problematic allergies.
- Limited data available on non-cystic fibrosis (CF) and non-penicillin agents.

**Objective & Methods**

- To evaluate the safety and efficacy of RIAD, a retrospective review of medical records of patients who underwent RIAD at Miami Valley Hospital (MVH) between 10/1/2009 and 3/30/2014 was performed.

**Results**

- A total of 23 RIAD courses were performed on 20 patients.
  - Fifteen (65.2%) were patients without CF, and eight (34%) were CF patients.
- Of 23 RIAD courses, 17 (74%) were successful.
- Of 23 courses, 15 were performed using non-penicillin agents.
- Only one of 15 CF courses was associated with increased morbidity.
- Conclusion: RIAD is an efficacious and safe modality to overcome problematic antibiotic allergies.

**Success rate**

- Overall success rate was 74%.
- CF success rate was 63%.
- Non-CF success rate was 80%.

* Reasons for failures were anaphylaxis (1), rash/hives (3) and other (2).

**Methods**

- **Study design:** Retrospective electronic medical review.
- **Study period:** October 2009 to March 2014.
- **RIAD Procedure:**
  - Each patient received seven progressively more concentrated infusions, each infused over 20 minutes, until full antibiotic dose was achieved [4].
- **Patient recruitment:** 23 desensitization in 20 patients were identified through pharmacy database at a single tertiary medical center.
- **Data collection:**
  - Reviewed prior allergy, complications associated with RIAD, and duration of antibiotic use.
  - Prior patient allergy was documented based on either historical information or documented observation.
  - Average follow-up after desensitization was 56 days.

**Table 1. Antibiotics used in RIAD and number of successes**

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Number of RIADs</th>
<th>Number of successes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ampicillin</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Piperacillin/tazobactam</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Cefazolin</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Meropenem</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**Figure 1. Days of successful antibiotic therapy following RIAD.**

- Four events reported to be successful at day 60 are in fact successful at days of 90, 575, 180, and 120.

**Figure 2. RIAD success overall, and in CF and non-CF patients.**

**Figure 3. RIAD success by antibiotic class.**

**Summary**

- RIAD is a valuable and safe method to optimize antibiotic therapy.
- Overall, 74% of desensitization were successful.
- Non-CF patients demonstrated 80% success; CF patients were 62.5% successful.
- Piperacillin with or without tazobactam, and ampicillin were responsible for five of the six failures.
- Our study includes first report of successful metronidazole desensitization.
- Prior failure of desensitization does not preclude future success.
- Pre-treatment with anti-histamines, H2 blockers, or corticosteroids was not associated with success versus failure.
- Limitations include lack of skin testing availability to determine if truly allergic and/or type I hypersensitivity.
- Our study demonstrated RIAD is efficacious and safe method to optimize antibiotic choice, minimize toxicities, and decrease costs associated with antibiotic allergy.

**References**