The Cost and Potential Avoidability of Antibiotic-Associated Adverse Drug Reactions

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\section*{Introduction}

- An adverse drug reaction (ADR) is a response to a medicine which is noxious and unintended occurring with the normal drug dose.
- ADRs result in significant health care utilization. An estimated 450,000 pediatric outpatient and 130,000 Emergency Department visits are attributed to undesired drug reactions that occur in the U.S. yearly.
- Antibiotics are the most common cause of pediatric ADRs.
- Little data is available describing the indications for which an implicated medication was prescribed to a child and whether or not an ADR was potentially avoidable.
- The economic burden of ADRs in the pediatric inpatient setting is known to be significant, but little is known about the additional cost associated with ADRs presenting to the ED and UC setting.

\section*{Objectives}

1) The primary objective was to characterize the scope and burden of pediatric ADRs resulting in a visit to the Emergency Department (ED) or Urgent Care (UC).
2) The secondary objective was to determine the associated cost and potential avoidability of antibiotic associated ADRs.

\section*{Methods}

- Retrospective chart review of patients diagnosed with an ADR in the Children's Mercy Hospital (CMH) ED or UC setting between July 1, 2013 - June 30, 2014.
- Patients were identified by the CMH Drug Safety Service which is an active pharmacovigilance program.
- The following data were extracted from the EMR: visit date, patient race/ethnicity, antibiotic at time of ADR, ADR symptoms/severity/type, days of medication exposure, medication indication, ADR treatment, ADR EMR documentation at the visit, subsequent medication prescribed or discontinued, disposition following ED/UC visit, charge of ADR visit, and 30 day recurrent ED/UC visit.
- Descriptive statistics were used for analysis.
- This study had institutional review board approval.

\subsection*{Table 1. ADR Type and Severity Classification}

<table>
<thead>
<tr>
<th>ADR Type/Severity Classification</th>
<th>Infusion</th>
<th>Ingestion</th>
<th>Injection</th>
<th>Intradermal</th>
<th>Occupational</th>
<th>Pulmonary (\geq 10%)</th>
<th>Skin (\geq 10%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adverse Allergy (\geq 10%)</td>
<td>15 (4)</td>
<td>12 (3)</td>
<td>8 (2)</td>
<td>2 (0.5)</td>
<td>1 (0.2)</td>
<td>1 (0.3)</td>
<td>1 (0.3)</td>
</tr>
<tr>
<td>Drug Reaction (\geq 10%)</td>
<td>10 (2)</td>
<td>8 (2)</td>
<td>5 (1)</td>
<td>1 (0.2)</td>
<td>1 (0.2)</td>
<td>1 (0.3)</td>
<td>1 (0.3)</td>
</tr>
</tbody>
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\section*{Results}

- A total of 430 children were identified as being seen in the ED or UC for an active ADR.

\subsection*{Table 2. Demographics and ADR Severity}

<table>
<thead>
<tr>
<th>Age (Years)</th>
<th>Median age 3.1 (IQR 0.1-18.8)</th>
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<tbody>
<tr>
<td>Race/Ethnicity (%)</td>
<td>White 60.90%, African American 14.40%, Latino 12.80%, Other 11.90%</td>
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<tr>
<td>Visit Location (%)</td>
<td>Emergency Department 62.60%, Urgency care 37.40%</td>
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<tr>
<td>ADR Severity (%)</td>
<td>Mild 0.70%, Moderate 89.10%, Severe 4.20%, Unknown 6.00%</td>
</tr>
</tbody>
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- A total of 430 pediatric ED and UC visits due to ADRs resulted in total charges of $432,388.68.

\section*{References}


\section*{Conclusions}

- ADRs result in patient harm and medical care utilization.
- The burden of ADRs among children is significant with greater than one child per day seeking medical care at our institution due to an undesired drug reaction.
- Antibiotics cause the large majority of pediatric ADRs resulting in ED/UC visits and a proportion of these ADRs appear to be avoidable.
- Pediatric ADRs are costly and result in additional medical treatment. ADRs represent a large area of potential cost savings for children's hospitals nationwide.
- Our findings likely underestimate the true burden of pediatric ADRs.

- Antimicrobial stewardship strategies to reduce unnecessary antibiotic prescribing need to incorporate the message of ADR risk.

\section*{Disclosure}

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