Bacterial Profile of Suspected Typhoid Intestinal Perforation Cases, Regional Hospital Centre, Maradi, Niger


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Outline

• Introduction
• Materials and methods
• Results
• Discussion
• Conclusion
Introduction

• Typhoid fever is a major public health crisis in Niger
  – Blood culture confirmation remains rare
• Patients often present with typhoid intestinal perforations (TIP)
  – Pathognomonic finding: longitudinal, oval, anti-mesenteric perforation of the intestine
• Typhoid and TIP occurs most commonly in school-aged children
Introduction

• Maradi has the highest frequency of typhoid perforations in the country.

Regional Hospital center of Maradi is one of the largest 2\textsuperscript{nd} type of health care.

- 450 beds with 30\% for the general surgery
- 6 attending general surgeons
- Yearly about 1500 patients were operated for acute abdomen
- 41\% account for the case of TIP (71\% <17 years).
Introduction

- TIP is related with a load of surgeries
  - immediate:
    - ostomy (ostomy restoration…)
    - tertiary peritonitis (dehiscence anaestomosis of or wound)
  - Intermediate
    - Tertiary peritonitis
    - intestinal obstruction (frange)
  - long term
    - intestinal obstruction (frange)
    - incisional hernia …..

- lengthening hospital stay
  - Increase burden
  - No school
Purpose

First prospective blood culture study on pediatric TIP patients in Niger

Objectives:

– To describe the bacterial profile of TIP
– To understand local antimicrobial resistance patterns.
Methods

• Participants enrolled from Oct - Nov 2022
  – Inclusion Criteria
    • < 15 years of age
    • Suspected TIP requiring surgery
• Blood culture collected from participants
  – Sent to Epicentre lab for culture and sensitivity testing
  – Positive cultures sent to CERMES lab for confirmation
Results

Enrolled 50 Participants:

• 56% Male, 44% Female

• Mean age: 6.9 (range 18 month – 14 years)

• 89% of patients were transferred from an outside health facility

• 88% of participants received antibiotics prior to blood culture collection
Table 1: Blood culture isolates

<table>
<thead>
<tr>
<th>Germes isolés dans les hémocultures</th>
<th>Nombre</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Salmonella Typhi</em></td>
<td>8</td>
</tr>
<tr>
<td><em>E. coli</em></td>
<td>4</td>
</tr>
<tr>
<td><em>Salmonella non-Typhi</em></td>
<td>3</td>
</tr>
<tr>
<td><em>Serratia marsescens</em></td>
<td>1</td>
</tr>
<tr>
<td><em>Streptococcus spp</em></td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

18 (36%) samples were positive.
- 8 (44%) positive for *S. Typhi*
- 3 (16%) positive for NTS
Table 2: Antimicrobial Sensitivity

<table>
<thead>
<tr>
<th>Antibiotiques</th>
<th>Total, n = 16</th>
<th>Salmonella Typhi, n = 8</th>
<th>E. coli, n = 4</th>
<th>Salmonella spp, n = 3</th>
<th>Serratia marsecens, n = 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ampicilline</td>
<td>0 (0%)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Amoxicilline/Acide clavulanique</td>
<td>9 (50%)</td>
<td>6</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Piperacilline/Tazobactam</td>
<td>2 (11%)</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Ceftriaxone</strong></td>
<td>11 (61%)</td>
<td>8</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Ertapenem</td>
<td>15 (83%)</td>
<td>8</td>
<td>4</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Meropenem</td>
<td>16 (89%)</td>
<td>8</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Gentamicine</td>
<td>12 (67%)</td>
<td>8</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Amikacine/Tobramycine</td>
<td>16 (89%)</td>
<td>8</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td><strong>Ciprofloxacin</strong></td>
<td>1 (5.6%)</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Cotrimoxazole</td>
<td>0 (0%)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Azithromycine</td>
<td>7 (Non testé)</td>
<td>Non testé</td>
<td>Non testé</td>
<td>Non testé</td>
<td>Non testé</td>
</tr>
</tbody>
</table>

100% S. Typhi isolates resistant to ciprofloxacin, ampicillin, cotrimoxazole
Discussion

• 16% of suspected TIP patients have typhoid blood culture confirmation
  – 10-15% TIP culture positivity rates previously reported in the literature
  – Low positivity likely due to previous antibiotic use and prolonged illness

• 100% typhoid quinolone resistance in Niger
  – Ciprofloxacin is first line treatment of uncomplicated typhoid in Niger
  – Indicator of developing antimicrobial resistance in the region
Conclusion

- **TIP is frequent in our institution**
  - High morbidity, mortality, and economic burden
  - Impairs day to day surgical activities

- **TIP is preventable**
  - Improvements in water, hygiene and sanitation
  - Introduction of typhoid conjugate vaccine (TCV)
Thank you
Bibliography


2. Birkhold et al. Characterization of Typhoid Intestinal Perforation in Africa: Results From the Severe Typhoid Fever Surveillance in Africa Program. Open Forum Infectious Diseases. https://creativecommons.org/licenses/by/4.0/.

