Demographic and Clinical Characteristics of Adult Patients with Typhoid Fever in Cipto Mangunkusumo General Hospital Jakarta - Indonesia in 2012-2014

Bonita Effendi¹, Robert Sinto², Suhendro Suwarto²

¹Department of Epidemiology, Faculty of Public Health, Universitas Indonesia, Jakarta, Indonesia

²Division of Tropical and Infectious Diseases, Department of Internal Medicine, Faculty of Medicine, Universitas Indonesia, Jakarta, Indonesia

Presented in Coalition Against Typhoid, Bali, May 2015
OUTLINE

- Introduction
- Methods
- Results and Discussion
- Conclusion
Over 2.16 million episodes of typhoid, worldwide → 216,000 death (year 2000)

>90% of morbidity and mortality occurred in Asia

Indonesia: Case Fatality Rate 1.25% (year 2009)

Bulletin WHO May 2004; 82(5)
Epidemiology

• Indonesia 358-810 per 100,000 population of typhoid fever caused by *Salmonella typhi* (CDC, 2007)
• 64% typhoid fever in Indonesia occurs in 3-19 years old
• Mortality rate in Jakarta: 3.1-10.4% in hospitalized patients.
• North Jakarta study: the characteristic of typhoid patients varies - mostly occurs in urban area with poor sanitation.

INDONESIA

**National prevalence 1.6% (0.3% - 3%)**

12 provinces with prevalence above the national rate: Aceh, Bengkulu, Jawa Barat, Banten, NTB, NTT, South Borneo, East Borneo, South Sulawesi, Gorontalo, West Papua, Papua

**Jakarta** – the 2nd leading infectious disease w/ the highest mortality

- Aceh 2.96%
- Bengkulu 2.58%
- Banten 2.24%
- West Java 2.14%
- South Borneo 1.95%
- Gorontalo 2.25%
- South Sulawesi 1.80%
- West Nusa Tenggara 1.93%
- East Nusa Tenggara 2.33%
- East Borneo 2.33%
- West Papua 2.39%
- Papua 2.39%
• National average of households clean water utilization of < 20 liters per person per day is 14.4%.
• National average of households without any waste water disposal : 24.9%

(Riskesdas, 2007)

http://peakwater.org/tag/citarum-river/
Methods

• Cross sectional study.
• Medical records in Cipto Mangunkusumo General Hospital during January 2012-December 2014.
• Total sampling from medical record consisted of adult patients with diagnosis of typhoid fever.
• Data analysis - SPSS ver 17.0.
Results

Characteristic of the Patients

- 84 adult patients with diagnosis of typhoid fever

Gender (%)

- 64.3% Female
- 35.7% Male

Age (%)

- 46.4% 18-30 yr
- 21.4% 31-40 yr
- 21.4% 41-50 yr
- 6% 51-60 yr
- 4.8% ≥61 yr
### Clinical manifestations of Patients in RSCM (year 2012-2014)

<table>
<thead>
<tr>
<th>Clinical manifestation</th>
<th>N (n=84)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever (T &gt;37.2°C)</td>
<td>73</td>
<td>86.9</td>
</tr>
<tr>
<td>Nausea</td>
<td>56</td>
<td>66.7</td>
</tr>
<tr>
<td>Vomitus</td>
<td>34</td>
<td>40.5</td>
</tr>
<tr>
<td>Epigastric pain</td>
<td>27</td>
<td>32.1</td>
</tr>
<tr>
<td>Reduced appetite</td>
<td>17</td>
<td>20.2</td>
</tr>
<tr>
<td>Myalgia</td>
<td>17</td>
<td>20.2</td>
</tr>
<tr>
<td>Headache</td>
<td>17</td>
<td>20.2</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>15</td>
<td>17.9</td>
</tr>
<tr>
<td>Reduced consciousness</td>
<td>10</td>
<td>11.9</td>
</tr>
<tr>
<td>Constipation</td>
<td>7</td>
<td>8.3</td>
</tr>
</tbody>
</table>
Clinical Manifestations

- The mean±SD duration (days) of fever before hospital admission : 7.9±10.6 days
- The mean±SD length of hospitalization : 5.4±4.7 days
Laboratory Examination

- Laboratory examination was conducted by:
  - IgM Salmonella only: 13%
  - Widal and IgM Salmonella: 14.3%
  - Widal test only: 72.7%
Blood Culture

- Positive blood culture – typhoid (+)
- Negative blood culture –
  - Antibiotic administration
  - Lack of blood collection
  - Vaccination
- Standard diagnostic method, provided a large volume of blood (10-15 ml in adults).
- It shows 60-80% of patients with typhoid
- Blood culture: higher sensitivity in the first week of illness, yet reduced by prior use of antibiotics

Bone marrow culture

- More sensitive
- It is positive in 80-95% in patients with typhoid, history of antibiotics

Stool culture

- Depends on the amount of feces cultured (standard = 1 g)
- It is positive in 30% of patients with acute typhoid
- For the detection of carriers

<table>
<thead>
<tr>
<th>Diagnostic test</th>
<th>Sensitivity range (%)</th>
<th>Specificity range (%)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Microbiological tests</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood culture</td>
<td>40-80</td>
<td>NA</td>
<td>Widely regarded as the gold standard, but sensitivity may be low in endemic areas with high rates of antibiotic use—hence true specificity is difficult to estimate</td>
</tr>
<tr>
<td>Bone marrow cultures</td>
<td>55-67</td>
<td>30</td>
<td>Greater sensitivity but invasive and thus of limited clinical value, especially in ambulatory management</td>
</tr>
<tr>
<td>Urine culture</td>
<td>0-58</td>
<td>NA</td>
<td>Variable sensitivity</td>
</tr>
<tr>
<td>Stool culture</td>
<td>30</td>
<td>NA</td>
<td>Sensitivity lower in developing countries and not used routinely for follow-up</td>
</tr>
<tr>
<td><strong>Molecular diagnostics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polymerase chain reaction</td>
<td>100</td>
<td>100</td>
<td>Promising, but initial reports indicated similar sensitivity to blood cultures and lower specificity</td>
</tr>
<tr>
<td>Nested polymerase chain reaction</td>
<td>100</td>
<td>100</td>
<td>Promising and may replace blood culture as the new “gold standard”</td>
</tr>
<tr>
<td><strong>Serological diagnosis</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Widal test (tube dilution and slide agglutination)</td>
<td>47-77</td>
<td>50-92</td>
<td>Classic and inexpensive Despite mixed results in endemic areas, still performs well for screening large volumes. May need standardisation and quality assurance of reagents</td>
</tr>
<tr>
<td>Typhidot</td>
<td>66-88</td>
<td>75-91</td>
<td>Lower sensitivity than Typhidot-M</td>
</tr>
<tr>
<td>Typhidot-M</td>
<td>73-95</td>
<td>68-95</td>
<td>Higher sensitivity and specificity than classic Typhidot in some series, but other evaluations suggest that the performance may not be as robust in community settings as in hospital</td>
</tr>
<tr>
<td>Tubex</td>
<td>65-88</td>
<td>63-89</td>
<td>Promising initial results but has yet to be evaluated in larger trials in community settings</td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urine antigen detection</td>
<td>65-95</td>
<td>NA</td>
<td>Preliminary data only</td>
</tr>
<tr>
<td>NA=Not available.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Therapy

- Most of inpatients were treated with ceftriaxone 3-4 g per day (79.6%) and outpatients were treated with ciprofloxacin 500 mg b.i.d (34.7%).

Antibiotic Therapy for Inpatient

- Ceftriaxone: 79.6%
- Levofloxacin: 1.8%
- Ciprofloxacin: 5.0%
- Cefixime: 3.0%
- Chloramphenicol: 3.5%
- Cephadroxil: 1.8%
- Meropenem: 3.5%
- Carbapenem: 1.8%
Comorbidities

- Several comorbid: dengue fever (8.3%), lung infection (4.8%), hepatitis, urinary tract infection, diabetes mellitus, and hypertension.
Conclusion

• Indonesia – endemic area
• Young adult are common sufferers of typhoid fever in this hospital.
• In endemic area, typhoid fever needs to be considered in patients with fever, since it is the major clinical symptoms.
• Early diagnosis is important in order to administer adequate treatment and prevent complication
• Ceftriaxone and ciprofloxacin were the most chosen antibiotics in hospitalized and outpatients, respectively.
Suggestions

• Further documentation of typhoid cases in Indonesia.

• Further study regarding to diagnostic, therapeutic, and prevention of typhoid fever.
Thank You