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Hospital Based Rotavirus & Intussusception Surveillance in Bangladesh

Welcome
Hospital Based Rotavirus & Intussusception Surveillance in Bangladesh
Rotavirus & Intussusception Surveillance

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Component

- Hospital Based
- Rotavirus among <5 Yrs
- Intussusception among <2 Yrs
Rotavirus diarrhea kills a child in

- every minute in less developed world
- every hour in Bangladesh
Estimated Global Prevalence of Rotavirus Disease

Risk

1 : 293
1 : 65
1 : 5
1 : 1

Event

440,000 deaths
2 million hospitalizations
25 million outpatient visits
111 million episodes

25 million outpatient visits
111 million episodes
Etiology of Diarrhea

Developed countries
- Unknown
- Rotavirus
- Bacteria
- Adenovirus
- Calicivirus
- Astrovirus
- Escherichia coli

Developing countries
- Unknown
- Rotavirus
- Parasites
- Other bacteria
- Astrovirus
- Calicivirus
- Adenovirus
Rotavirus in Bangladesh

- Surveillance conducted in Dhaka & Matlab hospital of icddrb revealed that Children (<5 yrs) hospitalized with Acute Gastroenteritis - Rate of infection is

  - 20% in Dhaka hospital
  - 33% in Matlab hospital
Ongoing

Hospital Based Rotavirus & Intussusception Surveillance (HBRIS) in Bangladesh

IEDCR & ICDDR,B

with the support from USAID & US CDC

jointly started Rotavirus surveillance from July 2012
Rationale for surveillance

Government is planning to add rotavirus vaccine to immunization program, so it is essential to

- Describe pre-vaccine burden
- Describe pre-vaccine intussusception hospitalization rate
- Identify strain diversity
- Identify potential risk of intussusception after vaccine introduction
- Measure vaccine effectiveness & possible reasons of failure in future
Objectives of Surveillance

- Estimate proportion of rotavirus gastroenteritis hospitalizations among children <5 yrs of age
- Describe rotavirus strains circulating in different regions
- Estimate rate of intussusception hospitalizations among children <2 yrs of age
Hospitals included in the study

- Jahurul Islam Medical College Hospital (JIMCH) - Kishoregonj
- Rajshahi Medical College Hospital (RMCH) - Rajshahi
- Jalalabad Ragib-Rabeya MC Hospital (JRRMCH) - Sylhet
- World Mission Prayer League (LAMB) - Dinajpur
- Bangabandhu Memorial Hospital (BBMH) - Chittagong
- Jessore General Hospital (JGH) - Jessore
- Sher-e-Bangla Medical College Hospital (SBMCH) - Barisal
Study Design & Methods

- **Active Surveillance** – planned for 5-10 yrs
- **Study Populations Children**
  - <5 Yrs with Acute Gastroenteritis
  - <2 Yrs with Intussusception
- **Working team formed at IEDCR, icddr,b & implementing hospitals**
- **Patients enrolled following case definition from Paediatrics Medicine & Surgery ward**
- **Stool sample from every 4th patient is collected**
- **25% of specimens +ve for rotavirus tested for genotypes**
- Data & samples sent every 15 days
- Genotyping is done every quarterly
- Report is prepared every month
  - Hard copy shared with respective hospitals
  - Soft copy uploaded in IEDCR website
- Dissemination Seminar conducted for all
  - IEDCR, ICDDR,B
  - Policy makers, Program Managers
  - USAID, US CDC, WHO, Unicef
Proportion of acute gastroenteritis hospitalization with rotavirus by month

Months & Year

2013
## Children Hospitalized with Acute Gastroenteritis, Rotavirus Infection, Deaths & Intussusception from Jul 2012 – Jan 2014

<table>
<thead>
<tr>
<th>7 Hospitals</th>
<th>Rotavirus</th>
<th>Acute gastroenteritis Hospitalization</th>
<th>Sample</th>
<th>Positive (%)</th>
<th>Rotavirus associated deaths</th>
<th>Intussusception confirmed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>7 Hospitals</td>
<td>5766</td>
<td>1452</td>
<td>966 (67)</td>
<td>02</td>
<td>39</td>
</tr>
</tbody>
</table>
Control and Prevention

- No specific treatment
- Oral rehydration salt (ORS) solution
- Vaccination
Vaccine Efficacy

- High in developed countries
- Low in less developed countries
- In Bangladesh vaccine efficacy is 43%
Genotypes vs Vaccines

Sequence data of currently circulating Bangladeshi strains indicate mismatches in the antigenic epitoposes when compared with vaccine strains.
Conclusion

- Rotavirus diarrhoea occurs throughout the year with a sharp winter peak.
- Huge fluctuations observed with genotype distribution.
- There is no specific treatment.
Future Directions

- Need to continue surveillance to monitor
  - circulating rotavirus strains
  - vaccine impact
- Expand surveillance
- Suggest strain specific vaccine
- Estimate Community Disease Burden
- Epidemiological studies
  - Adults
  - Animals
  - Environment (River, Pond, Sewage)
Thank You