Hepatitis A Epidemiology: INDIA

Dr Vidya A Arankalle
Senior Deputy Director & Head, Hepatitis Division
National Institute of Virology
Epidemiology of Hepatitis A is changing in India
Hepatitis A as a sporadic disease

HAV in Children  HAV in Adults

- HAV 86%
- Others 14%

Year
- 1979-82
- 1994-96
Fig: Changing trend of proportion of patients with acute hepatitis due to HAV infection in different age groups

Source: Dr P Kar, Maulana Azad Medical college, Delhi
Etiology and Mortality among children with FHF

- Viral Hepatitis: 81.7% Recovery, 16.3% Mortality
- HEV + Enteric Fever: 65.4% Recovery, 16.3% Mortality
- Drug related: 81.7% Recovery, 65.4% Mortality
- ICC: 81.7% Recovery, 65.4% Mortality
- Wilson's Disease: 81.7% Recovery, 65.4% Mortality
- Enteric Fever: 81.7% Recovery, 65.4% Mortality
- HEV + Enteric Fever: 81.7% Recovery, 65.4% Mortality
- Unknown: 81.7% Recovery, 65.4% Mortality

81.7% HAV
65.4% singly
16.3% in combination
Exposure of LMSS population to HAV (1982-1998)
Exposure of HSS population to HAV (1982-1998)
Exposure of rural population to HAV (1983-1998)
Multivariate logistic regression analysis of Exposure to HAV

<table>
<thead>
<tr>
<th>Variable</th>
<th>No Analysed</th>
<th>OR (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSS</td>
<td>884</td>
<td>1</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>LMSS</td>
<td>3207</td>
<td>22.9 (17.4, 30)</td>
<td></td>
</tr>
<tr>
<td>Age&lt;15 yr</td>
<td>2651</td>
<td>1</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Age&gt;15 yr</td>
<td>1440</td>
<td>8.9 (6.5, 12.1)</td>
<td></td>
</tr>
<tr>
<td>Family size&lt;4</td>
<td>1341</td>
<td>1</td>
<td>&lt;0.0006</td>
</tr>
<tr>
<td>Family size&gt;4</td>
<td>2750</td>
<td>1.6 (1.2, 2)</td>
<td></td>
</tr>
</tbody>
</table>

Serosurvey due in 2008
• In 2004-05, anti-HAV positivity among voluntary blood donors from Pune from High Socioeconomic Strata (88.96%) was significantly less than the middle socioeconomic strata (95.86%) (P<0.01)

• The difference was more significant in 18-25 years than in > 25 years age group
Anti-HAV in rural adults (2006)

1. Rajasthan-133/143 (93%)
2. Gujrat 173/182 (95.1%)
3. Maharashtra 176/182 (96.7%)
4. Karnataka 146/182 (80.2%)
5. A Pradesh 173/182 (95.1%)
6. Kerala 162/182 (89%)
7. Tamilnadu 173/193 (89.6%)

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Overall 1136/1246 (91.17%)
Emergence of outbreaks of hepatitis A

- The prediction of HAV outbreaks has become a reality
- During 2002-2004, 6 outbreaks of hepatitis A were recorded among children from semi-urban and rural Maharashtra
- In 2004, an explosive hepatitis A outbreak occurred in adults from the southern state of Kerala (1170 cases)
- In 2007, Shimla (Himachal Pradesh, north India) experienced an epidemic of Hep A (450 cases)
- It is high time a definite national policy for control of hepatitis A is formulated.
First report of a large outbreak of hepatitis A in adults

The outbreak occurred in the Kottayam Medical College hospital area (MCHA) and nearby Panchayats of Kottayam district situated in Kerala (reported on 17-9-2004)
• 1180 cases of AVH were reported from the district including 540 from the KCHA
• Of the 540 cases, 170 were from the members of medical community
• The remaining patients included mainly local residents of three panchayats around MCHA
• In majority of the cases from areas other than the Panchayats nearby MCHA, a previous history of visit to MCHA & consumption of food/water from unhygienic food establishments around MCH campus were noticed.

• A substantial proportion of viral hepatitis patients were care-taking relatives of the patients hospitalized for other causes.

• Sewage treatment plant was non-functional since 1990
## HAV Viral Load

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>No Pos / No tested</th>
<th>Viral Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fecal sample from acute hepatitis A patient</td>
<td>1/1</td>
<td>$1.36 \times 10^7$</td>
</tr>
<tr>
<td>Sewage tank</td>
<td>1/1</td>
<td>$2.57 \times 10^3$</td>
</tr>
<tr>
<td>Overflowing sewage sample (2 meters away from the tank)</td>
<td>1/1</td>
<td>$2.65 \times 10^3$</td>
</tr>
<tr>
<td>A canal ~ 200 meters away from the sewage tank</td>
<td>1/1</td>
<td>Below 100 copies/ml</td>
</tr>
<tr>
<td>Water samples</td>
<td>0/13</td>
<td>-</td>
</tr>
</tbody>
</table>
Epidemic at Shimla

• An epidemic of hepatitis was investigated in Shimla in the month of Feb 07.
• The first case was detected on 21st Jan & 450 cases were reported up to 23rd Feb (population around 50,000).
• Two months before the onset of the epidemic, silver ionization method was introduced for water treatment at Kusumpti tank; chlorination was resumed since 28th Feb.
• Etiology --> HAV
Detection of Hepatitis Viruses in Sewage

- Round the year evaluation of sewage
- 40-fold conc yielded 100% HAV positivity
- HAV RNA positivity significantly higher than HEV RNA (p<0.03)
- Sewage treatment significantly reduced HAV positivity
Age for Hepatitis A vaccination

- Poor response in the presence of maternal antibodies shown
- 9 months appears to be the appropriate age
Anti-HAV Prevalence in chronic hepatitis

- The prevalence of HAV was 93.2% in patients with cirrhosis of liver and 94.6% in controls (Hyderabad)
- Similar results from northern and western India
- At present, chronic hepatitis patients do not constitute high-risk group for hep A vaccination
Conclusions

- India is experiencing transition in the epidemiology of Hepatitis A
- Both hyper and intermediate prevalence co-exist even in the same city
- Explosive outbreaks likely
- Formulation of national policy for the control of Hepatitis A is desirable