Epidemiology of HAV, HDV and HEV in Belgium

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HAV surveillance in Belgium

• Epidemiological data:
  **Sentinel labs** since 1994
  101 labs (+- 58% coverage)
  IgM+, Ag+ and/or PCR+ cases

• Mandatory notification in 3 regions

• Not included in scope of National Reference Centre for Hepatitis Viruses (B, C, D, E)

• Vaccination recommendations:
  MSM, travellers, risk groups, food workers
Sentinel laboratories
Notification rate confirmed cases

Decreasing incidence
1982-84: 72/100000*
1991-92: 23/100000*
2011-2016: **1,1 – 1,5/100000**

Stable since 2009: 128-167 cases/year
Highest in Brussels
Comparable to neighbouring countries

*High Health Council 2013 Advice 8815
Age, gender and season

Age:
- **5-9 y**: most cases
- **15 – 49 y**: decreasing incidence
- **≥ 70 y**: increase

Gender:
- M/F: 0.73 (2015) to 1.46 (2011)
- **<10 y**: more males
- **>70 y**: more females

Season:
- Highest in **fall** (Sept – Oct)
- Travel-related ?
HAV seroprevalence

1993: 55% (serum, Flanders)
   50% > 40y
2003: 20% (oral fluid, Flanders)
   16% > 40y
2018: new study WIV

HAV conclusions

- Decreasing incidence
- Mostly travel-related and children
- Need for more sequencing data (food-borne outbreaks)
- Progressive increase of susceptible population (ageing)
HDV surveillance in Belgium

- Lack of epidemiological data
- Analysis of HDV antibodies only in a few laboratories
- Not reported by sentinel laboratories
- No mandatory notification
- Confirmed cases reported by NRC (Antibody+, PCR+)
HDV surveillance in Belgium

• National Reference Centre:
  - 5-12 cases confirmed/y
  - 100-120 serology or PCR requests/y
  - 6% positivity rate

• 1 cross sectional multicenter study 2008-2009 (BASL)*:
  - 5,5% co-infection (44 HDV+/800 HBVsAg+)
  - 13.6% (6/44) also infected with HCV
  - Mostly male migrants
  - Screening for HDV co-infection should be reinforced

HEV surveillance in Belgium

- 2010: National Reference Centre (NRC)
- 2014: Sentinel Laboratory reporting
- No mandatory notification

From: Inst. for Molecular Virology, Wisconsin
HEV genotypes

<table>
<thead>
<tr>
<th>HEV genotype</th>
<th>Host</th>
<th>Geographic distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Human</td>
<td>Asia, Africa</td>
</tr>
<tr>
<td>2</td>
<td>Human</td>
<td>Mexico, Africa</td>
</tr>
<tr>
<td>3</td>
<td>Animal &gt; human</td>
<td>Worldwide</td>
</tr>
<tr>
<td>4</td>
<td>Animal &gt; human</td>
<td>China, South-East Asia</td>
</tr>
</tbody>
</table>

**Genotype 1:**
- acute hepatitis
- 20% case-fatality rate in pregnant women
- Faecal-oral, water-borne
- Large outbreaks in Africa and Asia

**Genotype 3:**
- Mostly mild, subclinical (>95%)
- Sometimes acute or chronic hepatitis, extrahepatic: GBS, neuralig amyotrophy
- Immune suppressed, transplant recipients
- Food-borne, zoonotic
- Sporadic cases
Seroprevalence humans

- 2012: Fertility center and orthopedic clinics UZ Gent (patients from East and West Flanders): 14% (Wantai ELISA, Van Hoecke et al.)

- 2012: Healthy factory workers Gosselies (n = 200): 8.5% (Mikrogen ELISA)

- NRC sera suspected patients:
  - 2010 - 2014: 10% (Mikrogen ELISA)
  - 2015 - 2017: 16% (Wantai ELISA)

- Planned: cross-sectional seroprevalence study Belgian population (Wantai ELISA)

National Reference Centre (NRC) at WIV  
Notification rate confirmed cases

• Data will be published soon
Positivity rate confirmed/suspected cases submitted to the NRC

- Data will be published soon
Genotyping Belgian HEV

• Data will be published soon
Phylogeny genotype 3 isolates Belgium 2010-2016

- Data will be published soon
Notification rate per province (Gt3) 2010-2016

• Data will be published soon
Age, gender, season

- Data will be published soon
HEV domestic pigs Belgium

• 2008 (Hakze-van der Honing et al.):
  Fecal samples:
  • 7% (8/115) HEV+
  • 1 HEV-3f and 4 HEV-4b
  • First isolation of Genotype 4 in swine in Europe

• 2010-2011 (Thiry et al.):
  Sera:
  • 73% seroprevalence
  • 1% (4/420) HEV+
  • HEV-3f (cfr humans)

HEV wildlife Belgium (2010-2012)

• Wild boar:
  – Antibodies: 34%
  – HEV-3 RNA: 7% (4/61) livers
    6% (4/69) sera

• Red deer:
  – Antibodies: 1% (roe deer: 3%)
  – HEV-3 RNA: 3% (1/29) livers

Wild boar can be considered as a host reservoir

Thiry et al. Transbound Emerg Dis. 2017 Jun;64(3):764-773
Conclusions HEV

- Confirmed cases tripled since 2010
  Mostly locally acquired genotype 3 cases
  Similar subtypes as in swine and wild boar
  Higher incidence in French-speaking provinces

- Increased awareness and testing
  True emergence of HEV-3c: from rare to dominant subtype

- Notification rate and seroprevalence relatively low compared to other EU countries

- More data needed on the epidemiology in swine – infectivity in food
  Recommendations to prevent infection in vulnerable people needed
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