Hepatitis E in South Africa

Tongai Maponga

7th FIDSSA CONGRESS 2017
This is what usually comes to mind
History of hepatitis E virus

- An ET-NANB hepatitis virus later named HEV was first suspected in 1980.

- This followed an outbreak of acute viral hepatitis in the Kashmir Valley, India, between November 1978 and April 1979.
  - 275 clinical cases among 16,620 inhabitants, 11-40 years old in villages with common water source
History of hepatitis E virus

• The findings of HEV were supported by retrospective analysis of a large outbreak of hepatitis in New Delhi (1955–1956).
  – Source: contaminated municipal water from flooded Yamuna river.
  – 29 000 icteric cases.

• Pregnant women often had fulminant hepatic failure with high case-fatality rate.
Current epidemiology of HEV

- Approximately 20 million infections worldwide each year.
- 3.3 million symptomatic cases of hepatitis E/annum.
- 56,600 hepatitis E-related deaths/annum.
- Clinical attack rates highest in young adults aged 15–49 years.
Global distribution of HEV
Overview of different routes of HEV transmission. Proven modes of transmission are indicated in solid arrows, whereas potential routes of spread are indicated with dashed arrows.
Virology of HEV

- Genus: *Hepevirus*.
- Family: *Hepeviridae*.
- Spherical particles measuring 27–34 nm in diameter.
- Genome consists of positive-sense, single-stranded RNA.
- Approximately 7.2-Kb long.
- Three discontinuous and partially overlapping ORFs.
Genomic variability

- HEV isolates from human and other mammals have been mostly divided into four genotypes, namely 1, 2, 3 and 4.
Genomic variability

- Each HEV genotype appears to have a specific geographic distribution.
- Genotypes 1 and 2 HEV isolated from human cases of epidemic and sporadic hepatitis E where the disease is highly endemic.
- HEV genotypes 3 and 4 appear in humans and animals- responsible for zoonotic infections.
- Camelid HEV genotype 7 also linked with zoonotic transmission.
Signs and symptoms of HEV infection

• Mean incubation period: 6 weeks (2–9).

• Symptomatic infection is most common in young adults aged 15–40 years.

• Hepatitis like signs and symptoms include:
  – Jaundice, fever, loss of appetite, abdominal pain, lethargy, ↑ ALT

• Children often show no symptoms or only a mild illness without jaundice that goes undiagnosed.

• Hepatitis E is not clinically distinguishable from other types of acute viral hepatitis.
Diagnosis of HEV

- Diagnosis: presence of antibody against HEV or detection of HEV RNA.

- Viremia usually lasts for 2-4 weeks.

- Viruses are excreted into the bile and shed in the faeces for 4-6 weeks.

- Virus is detected for longer in stool than from plasma.
Treatment of HEV infection

- No specific treatment capable of altering the course of acute infection.
- Disease is usually self-limiting, hospitalization is generally not required.
- Hospitalization may be needed for patients with fulminant hepatitis.
- Immunosuppressed people with chronic hepatitis E benefit from specific treatment using ribavirin. Interferon has also been used successfully.
- Decreasing the dosage of immunosuppressive therapy in transplant recipients may also promote clearance of infection.
Prevention of HEV

- Vaccine (currently only licensed in China for use in people aged ≥16 years).
- Quality standards for public water supplies.
- Proper disposal systems of faecal waste.
- Hygienic practices such as hand-washing with safe water, particularly before handling food.
- Safe food practices.
HEV in South Africa

• The first case in SA was described in 1992 of a 34-year-old woman from Cape Town who presented at 32 weeks gestation with diarrhoea, jaundice, and episodic confusion.
• She had returned from holiday in India where she had also had a history of contact with hepatitis in India.
• She may have subsequently passed the infection to the referring physician and two theatre sisters in maternity unit, Groote Schuur Hospital.

Hospital outbreak of hepatitis E

Sir,—Enteric non-A, non-B epidemic hepatitis virus infection (hepatitis E) clinically resembles hepatitis A, with an incubation period of 3–9 weeks.1 Though initially described in India, hepatitis E is a global disease with high prevalence rates in the developing world.2,3 Secondary attack rates among exposed household members are low but substantially greater than attack rates in non-exposed controls, suggesting that faecal-oral transmission of HEV does occur but is less common than for hepatitis A.4 We report a serologically confirmed case of hepatitis E infection with probable transmission to a doctor and two nurses at the Groote Schuur Hospital, Cape Town, South Africa.

HEV in South Africa

- Most data is based on seroprevalence studies conducted using assays that were not as sensitive/specific compared to those currently available.

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<tr>
<th>Year</th>
<th>Prevalence</th>
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<td>1996</td>
<td>10.7% (n=767)</td>
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<td>360 rural adults (19.1%)</td>
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<tr>
<td>1994</td>
<td>2.0% (n=782)</td>
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<td>555 canoeists exposed to sewage contaminated water (1.8%).</td>
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Chronic HEV infection in an HIV-infected patient in Cape Town.

Presented with persistently ↑ liver transaminases after starting ART.
Chronic HEV in HIV-infected male

HEV Genotype 3 infection.
HEV in South Africa

Transmission of HEV genotype 3 post-kidney transplant from consumption of pork.

Taking immunosuppressive therapy at the time of acquisition of infection.
Phylogenetic analysis of Cape Town HEV cases
HEV in South Africa

SHORT REPORT
Racial differences in seroprevalence of HAV and HEV in blood donors in the Western Cape, South Africa: a clue to the predominant HEV genotype?

T. LOPES¹, R. CABLE², C. PISTORIUS², T. MAPONGA¹, S. IJAZ³, W. PREISER¹, R. TEDDER³,⁴ AND M. I. ANDERSSON¹,⁵*

¹ Division of Medical Virology, Department of Pathology, University of Stellenbosch, South Africa
² Western Province Blood Transfusion Service, Cape Town, South Africa
³ Virus Reference Department, Public Health England, London, UK
⁴ NHS Blood and Transfusion, London, UK
⁵ Oxford University NHS Foundation Trust, Oxford, UK

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- No evidence of viraemic HEV infection among blood donors in the Western Cape, HEV IgG prevalence of 26%.
HEV in South Africa

• Seroprevalence of 27.9% (n = 324/1161)
• No viraemic infections
• Greatest risk factors were being ≥30 years, followed by pork consumption
• Case report of a 54 yr old white male
• Death due to fulminant hepatic failure
• HEV genotype 3 detected from serum sample
HEV studies among humans in SA

• Evidence of viraemic HEV infections among humans within Cape Town.

• Evidence points to HEV genotype 3 as the main infecting genotype.
  – Infections likely due to zoonotic transmission.

• There is a risk of chronic HEV infection developing in immunocompromised patients including organ transplant recipients.

• Serological evidence of HEV infection among blood donors likely points towards zoonotic(?) transmission as source of infection.
  – No viraemic infections seen among 300 blood donors.

• Clinical suspicion may be warranted for patients with unexplained hepatitis after exclusion of the routine causes.
HEV in Western Cape South African pig herds

Surveillance to investigate the epidemiology of potentially zoonotic hepatitis E in commercial pig herds supplying Cape Town, South Africa

LS VAN HELDEN, S KORSMAN, JD GREWAR, P THOMPSON, S ISAACS, K PICOZZI, M ANDERSSON, W PREISER

1Epidemiology Section, Veterinary Services, Western Cape Department of Agriculture, Elsenburg, South Africa; 2Groote Schuur National Health Laboratory Service, Cape Town, South Africa; 3Division of Medical Virology, Department of Pathology, Faculty of Health Sciences, University of Cape Town, Cape Town, South Africa; 4Department of Production Animal Studies, Veterinary Science Faculty, University of Pretoria, Pretoria, South Africa; 5Centre for Infectious Diseases, Division of Pathway Medicine, Deanery of Biomedical Sciences, Edinburgh Medical School, The University of Edinburgh, Edinburgh, United Kingdom; 6Division of Medical Virology, Department of Pathology, Faculty of Health Sciences, Stellenbosch University, Cape Town, South Africa

• Cross-sectional study of 16 commercial pig herds supplying pork to Cape Town.

• All 16 farms tested were seropositive for HEV.

• Seroprevalence median of 0.93 (range: 0.06 to 1).

• Viral RNA was detected in 3/45 serum samples tested.
HEV in Western Cape pig herds

Sequence from pig clusters with HEV sequences obtained from human patients in Cape Town
Zoonotic transmission of HEV in SA

• Hepatitis E is present in South African pigs and may pose a zoonotic risk to local pork producers, farm workers, abattoir workers, butchers and pork consumers.

• Pork producers have a responsibility to protect the health of these groups of people, by putting in place measures not only serve to prevent the introduction and spread of HEV in pig herds.

• There is need to prevent environmental contamination by pig herds that are HEV infected.
  – Avoid contamination of water sources by faecal material from piggeries.
....and this too!
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