

# **Prevalence of hepatitis E virus infection**

**Maria Buti**

**Hospital General Universitario Valle de Hebron  
Barcelona**

# Prevalence of hepatitis E virus infection

- Seroepidemiological Surveys
- Clinical Cases Reports

# Prevalence of hepatitis E virus infection

- Seroepidemiological Surveys in the Northeast of Spain (Catalonia)
  - Community Based
    - Adults
    - Children
- Clinical Cases Reports

# Community- Based Seroepidemiological Survey in Adults Material and Methods



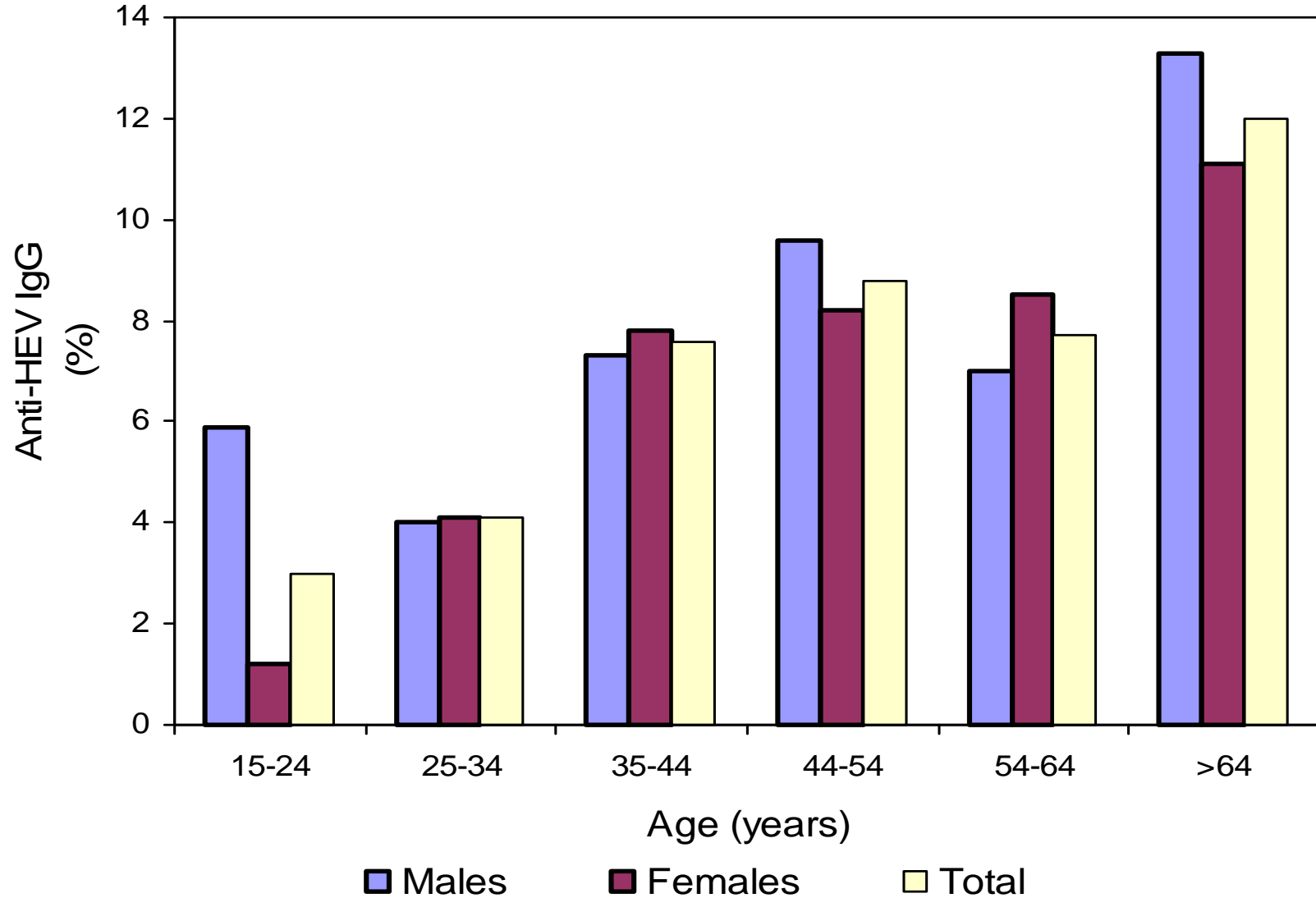
- Catalonia in 2002**  
**6 million population**
- **15 years**
  - **1,280 people**
  - **From 97 municipalities**
  - **Urban and rural population**
  - **Informed consent**

# Material and Methods

- **Serological Test**
  - **Anti HEV IgG by EIA method (Bioelisa HEV IgG Biokkit, Barcelona, Spain)**
- **Sociodemographic, and clinical variables**
  - **Age, gender, place of birth, place of residence, occupation and risk factors**

# Prevalence of antibodies (%) to the hepatitis E virus

**IgG antiHEV antibodies were detected in 96 (7.3%) of 1,280 healthy subjects**



# Variables associated with the prevalence of antibodies to the hepatitis E virus

| Risk factor                    |     | Prevalence % ( 95 %CI) | n    | OR ( 95 %CI)<br>OR aj. (95 %CI) | p     |
|--------------------------------|-----|------------------------|------|---------------------------------|-------|
| Minor surgery                  | Yes | 11.6 (7.7-15.5)        | 259  | 1.96 (1.24-3.11)                | 0.003 |
|                                | No  | 6.3 (4.8-7.8)          | 1008 | 1.68 (1.03-2.70)                | 0.035 |
| Abdominal surgery              | Yes | 10.4 (7.0-13.8)        | 317  | 1.74 (1.12-2.73)                | 0.013 |
|                                | No  | 6.2 (4.7-7.7)          | 947  | 1.38 (0.86-2.20)                | 0.183 |
| Uniparous or Multiparous women | Yes | 8.3 (5.9-10.7)         | 517  | 2.84 (1.19-6.79)                | 0.014 |
|                                | No  | 3.1 (0.7-5.5)          | 194  | 1.81 (0.76-4.33)                | 0.177 |

# Multivariate analysis

- The only variable statistically associated with the presence of anti-HEV antibodies in the multivariate analysis was minor surgery (OR:1.68; 95% CI;1.03-2.70)



# Community- Based Seroepidemiological Survey in Children

## Material and Methods



- 1, 249 healthy children
- Aged: 5 and 15 years old.
- Urban and rural population
- January to May of 2001

# Material and Methods

- **Serological Test**
  - **Anti HEV IgG by EIA method (Bioelisa HEV IgG Biokkit, Barcelona, Spain)**
- **Sociodemographic, and clinical variables**
  - **Age, gender, place of birth, place of residence, occupation and risk factors**

# IgG anti-HEV antibodies

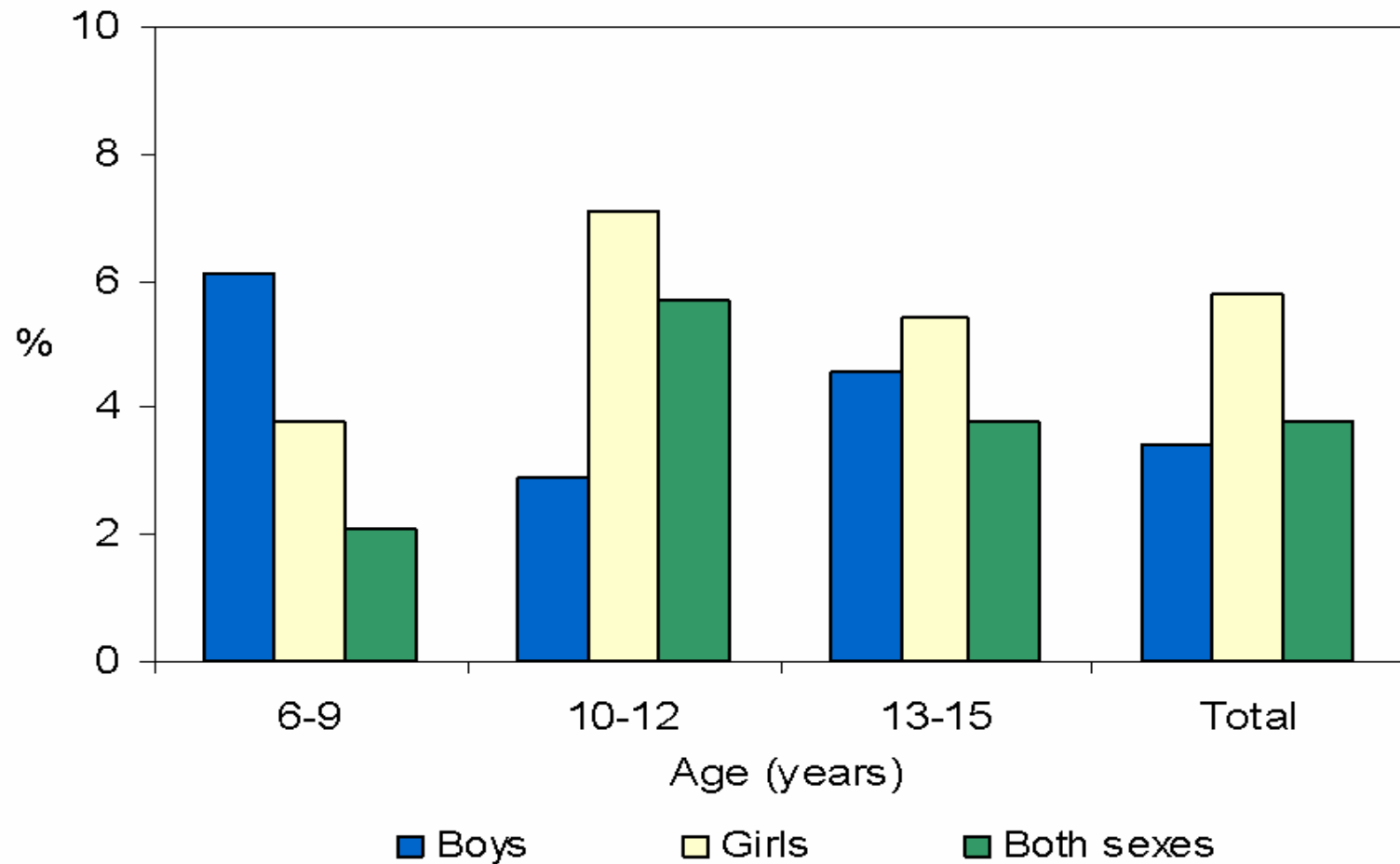
- in 57 (4.6%) of the 1,249 samples
- The prevalence was higher in girls, with 5.8% (35/607), than in boys 3.4 % (22/642) in boys (3.4%), but differences were not statistically significant.

# Distribution of the sample and the population by socio-demographical variables

| <b>Variable</b>        | <b>Sample<br/>(n=1,249)</b> | <b>Population of<br/>Catalonia*</b> |
|------------------------|-----------------------------|-------------------------------------|
| <b>Age:</b> 6-12 years | <b>55.7 %</b>               | <b>68.2 %</b>                       |
| 13-15 years            | <b>44.3 %</b>               | <b>31.8 %</b>                       |
| <b>Habitat:</b> Urban  | <b>76.9 %</b>               | <b>80.3 %</b>                       |
| Rural                  | <b>23.1 %</b>               | <b>19.7 %</b>                       |
| <b>Sex:</b> Boys       | <b>51.4 %</b>               | <b>51.4 %</b>                       |
| Girls                  | <b>48.6 %</b>               | <b>48.6 %</b>                       |

\*Institut d'Estadística de Catalunya. Anuari Estadístic de Catalunya, 2001

Figure 1. Prevalence (%) of IgG anti-HEV in children by age and sex. Catalonia (Spain), 2001



| <b>Variable</b>       |                                | <b>N° of anti-VHE positive</b> | <b>Anti-VHE Prevalence %<br/>(IC 95 %)</b> | <b>n</b>     |
|-----------------------|--------------------------------|--------------------------------|--|--------------|
| <b>Sex</b>            | <b>Boy</b>                     | <b>22</b>                      | <b>3.4 (1.9-4.9)</b>                       | <b>642</b>   |
|                       | <b>Girl</b>                    | <b>35</b>                      | <b>5.8 (3.8-7.7)</b>                       | <b>607</b>   |
| <b>Habitat</b>        | <b>Urban</b>                   | <b>48</b>                      | <b>5.0 (3.6-6.4)</b>                       | <b>960</b>   |
|                       | <b>Rural</b>                   | <b>9</b>                       | <b>3.1 (0.9-5.3)</b>                       | <b>289</b>   |
| <b>Place of birth</b> | <b>Spain</b>                   | <b>54</b>                      | <b>4.4 (3.2-5.6)</b>                       | <b>1,225</b> |
|                       | <b>Europe</b>                  | <b>1</b>                       | <b>16.7 (0.4-64.1)</b>                     | <b>6</b>     |
|                       | <b>Asia, Africa or America</b> | <b>2</b>                       | <b>11.1 (1.4-34.7)</b>                     | <b>18</b>    |
| <b>Social class</b>   | <b>I-III</b>                   | <b>23</b>                      | <b>3.5 (2.0-4.9)</b>                       | <b>524</b>   |
|                       | <b>IV-V</b>                    | <b>27</b>                      | <b>5.8 (3.6-8.0)</b>                       | <b>467</b>   |
|                       | <b>VI</b>                      | <b>7</b>                       | <b>5.8 (1.2-10.4)</b>                      | <b>76</b>    |

|  |                              |           |                        |                     |
|--|------------------------------|-----------|------------------------|---------------------|
| <b>Place of birth of parents</b>         | <b>Spain</b>                 | <b>53</b> | <b>4.4 (3.2-5.6)</b>   | <b>1,200<br/>49</b> |
|  | <b>Both in other country</b> | <b>4</b>  | <b>8.2 (2.3-19.6)</b>  |                     |
| <b>Accidents causing bleeding wounds</b> | <b>Yes</b>                   | <b>10</b> | <b>3.2 (1.1-5.3)</b>   | <b>311<br/>928</b>  |
|  | <b>No</b>                    | <b>47</b> | <b>5.1 (3.6-6.5)</b>   |                     |
| <b>Dental extractions</b>                | <b>Yes</b>                   | <b>14</b> | <b>4.8 (2.1-7.4)</b>   | <b>294<br/>955</b>  |
|  | <b>No</b>                    | <b>43</b> | <b>4.5 (3.1-5.9)</b>   |                     |
| <b>Surgical Interventions</b>            | <b>Yes</b>                   | <b>11</b> | <b>2.9 (1.1-4.8)</b>   | <b>375<br/>874</b>  |
|  | <b>No</b>                    | <b>46</b> | <b>5.3 (3.7-6.8)</b>   |                     |
| <b>History of acute viral hepatitis</b>  | <b>Yes</b>                   | <b>1</b>  | <b>25.0 (0.6-80.6)</b> | <b>4<br/>1,245</b>  |
|  | <b>No</b>                    | <b>56</b> | <b>4.5 (4.5-5.6)</b>   |                     |

## Two Children with IgM anti-HEV

| <b>Age</b> | <b>Sex</b>  | <b>IgG Anti-HEV</b> | <b>IgG Anti-HAV</b> | <b>Anti-HBc</b> | <b>Anti-HCV</b> | <b>HBsAg</b> | <b>Anti-HBs</b> |
|------------|-------------|---------------------|---------------------|-----------------|-----------------|--------------|-----------------|
| <b>12</b>  | <b>Boy</b>  | +                   | +                   | -               | -               | -            | +               |
| <b>12</b>  | <b>Girl</b> | +                   | +                   | -               | -               | -            | +               |



# Four Children with history of acute viral hepatitis

| Age | Gender | IgG Anti-HEV | IgG Anti-HAV | Anti-HBc | Anti-HCV | HBsAg | Anti-HBs |
|-----|--------|--------------|--------------|----------|----------|-------|----------|
| 14  | Boy    | -            | +            | -        | -        | -     | +        |
| 13  | Boy    | +            | -            | +        | -        | -     | +        |
| 13  | Boy    | -            | +            | -        | -        | -     | +        |
| 13  | Boy    | -            | +            | -        | -        | -     | -        |

# Conclusion

- The study found a prevalence of anti-HEV antibodies of 4.6% in Spanish children, suggesting that some children are exposed to HEV in early childhood.
- No variables were associated with a higher risk of HEV infection

# Clinical Cases

- All cases reported in Adults
- 3 cases of Acute Hepatitis ·
  - HEV RNA( 2 Genotype 3/1Genotype 1)
- 18 cases of acute hepatitis E
  - 12 sporadic/6 imported
  - Diagnosis IgM antiVHE
- 1 Case in a worker of an slaughterhouse
  - HEV-RNA (Genotype 3)

# Acknowledgements

- Hospital Valle Hebron
  - R Jordi
  - M Schaper
  - F Rodriguez-Frias
  - R Esteban
- Faculty of Biology  
University of Barcelona
  - R Girones
- Directorate of Public Health,  
Generalitat of Catalonia
  - Angela Domínguez
  - Pere Plans,
  - Jordi Espuñes
  - Neus Cardoso
  - A Plasencia
  - L Salleras