The hepatitis A epidemic in Puglia, Italy: lessons learnt and application of prevention programmes

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Cattedra di Igiene - University of Foggia

VHPB Meeting, Catania 7-8 November 2002
Puglia, South Italy
Hepatitis A in Puglia
1989/2001

cases per 100,000

Hepatitis A in Puglia

monthly notified cases - jan 96/jun 02

- 1996: 5,673 cases
- 1997: 5,395 cases
- 1998: 940 cases
- 1999: 438 cases
- 2000: 254 cases
- 2001: 454 cases
- 2002: lower numbers
# Hepatitis A in Bari

## Case control study, first round Jan/Apr 96

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Uni variate analysis</th>
<th>Multivariate analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
<td>95% CI</td>
</tr>
<tr>
<td><strong>First round</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raw seafood</td>
<td>31.8</td>
<td>12.1 - 118</td>
</tr>
<tr>
<td>frequent consumers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intermediate consumers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rare consumers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pastries</td>
<td>0.6</td>
<td>0.4 - 0.9</td>
</tr>
<tr>
<td>Fresh vegetables</td>
<td>0.7</td>
<td>0.4 - 1.1</td>
</tr>
<tr>
<td>Milk-dairy products</td>
<td>0.8</td>
<td>0.4 - 1.4</td>
</tr>
<tr>
<td>Contact with a case</td>
<td>not cal culable</td>
<td>2.5 - ∞</td>
</tr>
</tbody>
</table>
## Hepatitis A in Bari
### Case control study, second round Aug 96

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Uni variate analy s i s *</th>
<th>Multiv ariate anal y s i *</th>
<th>§</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
<td>95% CI</td>
<td>OR</td>
</tr>
<tr>
<td><strong>Second round</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumption of Muss el s s</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muss el s kept out of water</td>
<td>12.6</td>
<td>5.2 - 30.7</td>
<td>9.6</td>
</tr>
<tr>
<td>Muss el s kept in water</td>
<td>41.4</td>
<td>11.79 - 145.1</td>
<td>24.6</td>
</tr>
<tr>
<td>No information on storage</td>
<td>24.6</td>
<td>11.6 - 52.4</td>
<td>17.8</td>
</tr>
<tr>
<td>Regular consumption of raw seafood</td>
<td>5.6</td>
<td>3.6 - 8.7</td>
<td>1.8</td>
</tr>
<tr>
<td>Consumption of fresh vegetables</td>
<td>0.7</td>
<td>0.4 - 1.0</td>
<td>0.9</td>
</tr>
<tr>
<td>Holidays</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long distance from Bari city</td>
<td>0.2</td>
<td>0.1 - 0.3</td>
<td>0.2</td>
</tr>
<tr>
<td>Intermediate distance from Bari city</td>
<td>0.3</td>
<td>0.2 - 0.6</td>
<td>0.4</td>
</tr>
<tr>
<td>Short distance from Bari city</td>
<td>0.8</td>
<td>0.2 - 3.6</td>
<td>0.7</td>
</tr>
<tr>
<td>Gender</td>
<td>1.3</td>
<td>0.9 - 1.9</td>
<td>1.8</td>
</tr>
<tr>
<td>Contact with a case of hepatitis A</td>
<td>1.6</td>
<td>0.3 - 9.8</td>
<td>1.4</td>
</tr>
</tbody>
</table>
Hepatitis A in Puglia
analysis of SEIEVA data

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw seafood consumption</td>
<td>4.00</td>
<td>4.17</td>
<td>3.86</td>
<td>9.57</td>
<td>2.47</td>
</tr>
<tr>
<td></td>
<td>(2.46-5.9)</td>
<td>(2.36-7.4)</td>
<td>(2.07-7.25)</td>
<td>(4.59-20.22)</td>
<td>(1.18-5.12)</td>
</tr>
<tr>
<td>Away from home</td>
<td>0.33</td>
<td>0.82</td>
<td>0.79</td>
<td>3.56</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>(0.18-0.6)</td>
<td>(0.37-1.8)</td>
<td>(0.34-1.9)</td>
<td>(0.47-78.25)</td>
<td>(0.10-0.5)</td>
</tr>
</tbody>
</table>
Mussels and other sea-food
Street market, Bari
Mussels and other sea-food
Street market, Bari
Hepatitis A in Puglia

monthly notified cases - jan 98/jun 02

n. of cases

1998 1999 2000 2001 2002
Hepatitis A in Puglia: 1996

February
(267 cases)

July
(655 cases)
Hepatitis A in Puglia: 1997

February
(238 cases)

July
(1,426 cases)
Hepatitis A in Puglia: 1998

February
(116 cases)

July
(216 cases)
Hepatitis A in Puglia: 1999

February
(136 cases)

July
(14 cases)
Hepatitis A and Typhoid fever in Puglia, 1996/2002
An outbreak of Hepatitis A associated with an infected food handler in Bari

- **Outbreak (26 cases)**
- **Other notified cases**

**Index case**
Analytical issues

- Significant association with consumption of food prepared by infected food handler
  - OR = 5.36; IC 95% = 1.58-19.25
- Other risk factors were not significant (mussels and other raw sea-food, drinkable water, food purchased elsewhere)
Genetic characterization of HAV

All isolated strains belonged to \textit{genotype I}, \textit{sub-genotype IB}.
Hepatitis A virus and mussels

Detection of hepatitis A virus in mussels from different sources marketed in Puglia region (South Italy)

M. Chironna\textsuperscript{a}, C. Germinario\textsuperscript{a}, D. De Medici\textsuperscript{b}, A. Fiore\textsuperscript{b}, S. Di Pasquale\textsuperscript{b}, M. Quarto\textsuperscript{a,*}, S. Barbuti\textsuperscript{a}

\textsuperscript{a}Department of Internal Medicine and Public Health-Hygiene Section, University of Bari, Policlinico, Piazza G. Cesare, 11-70124 Bari, Italy
\textsuperscript{b}Istituto Superiore di Sanità-Reparto Igiene delle Tecnologie Alimentari-Laboratorio Alimenti, Viale Regina Elena 299-00161 Rome, Italy

Received 16 May 2001; received in revised form 13 September 2001; accepted 31 October 2001
Hepatitis A virus and mussels

<table>
<thead>
<tr>
<th>Samples (from)</th>
<th>Total number</th>
<th>Positive by nested RT-PCR</th>
<th>Positive by cell culture assay</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Non-depurated</td>
<td>100</td>
<td>20</td>
<td>20.0</td>
</tr>
<tr>
<td>Greece</td>
<td>70</td>
<td>17</td>
<td>24.2</td>
</tr>
<tr>
<td>Spain</td>
<td>20</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Italy (Taranto).</td>
<td>10</td>
<td>3</td>
<td>30.0</td>
</tr>
<tr>
<td>Depurated</td>
<td>90</td>
<td>10</td>
<td>11.1</td>
</tr>
<tr>
<td>Greece</td>
<td>80</td>
<td>8</td>
<td>10.0</td>
</tr>
<tr>
<td>Italy (North)</td>
<td>10</td>
<td>2</td>
<td>20.0</td>
</tr>
<tr>
<td>Collected in seafood markets</td>
<td>100</td>
<td>23</td>
<td>23.0</td>
</tr>
<tr>
<td>Total</td>
<td>290</td>
<td>53</td>
<td>18.2</td>
</tr>
</tbody>
</table>
Hepatitis A and mussels

Strains isolated from patients in Bari outbreak was strictly related to those isolated from Greek mussels (depurated and not depurated)

the index case referred consumption of raw mussels before the disease
Hepatitis A cost analysis

Average cost of a case: 3,280 euros

Cost of epidemic (1996/97) in Puglia: > 36,000,000 euros

PharmacoEconomics 1998, 13(2): 257-266
“To achieve a sustained reduction in national incidence of hepatitis A, more widespread routine vaccination of children is needed.”

“States in which the average annual incidence of hepatitis A was ≥20 cases per 100,000 during 1987–1997”
HAV vaccination in Puglia

- Vaccination programme since 1997:
  - newborns
  - 12 years old

- Vaccination coverage in 2000-2001:
  - newborns: 10-15%
  - 12 years old: 75-80%
Hepatitis A in Puglia

*monthly notified cases - jan 96/jun 02*

- **n. of cases**
  - 0
  - 200
  - 400
  - 600
  - 800
  - 1000
  - 1200
  - 1400
  - 1600
  - 1800

- **Years:**
  - 1996
  - 1997
  - 1998
  - 1999
  - 2000
  - 2001
  - 2002

- **Vaccination campaign**
Hepatitis A in Puglia
distribution by age of notified cases
Conclusions

- Puglia is an intermediate endemicity level region for Hepatitis A
- Cyclical outbreaks occurred up to 1997
- Consumption of raw sea food is the most important risk factor for the disease (especially in the first phase of outbreaks)
- Immunological status of population determines the spread of infection (person to person transmission)
- Genetic characterization is important to study HAV transmission patterns
- Vaccination programmes are effective to achieve a sustained reduction in incidence of Hepatitis A and seem to be cost-saving