Epidemiology of hepatitis C

Françoise Roudot-Thoraval
Department of Public Health
Henri Mondor Hospital, Créteil,
University Paris XII
History of the HCV epidemic

100,000 to 400,000 individuals

Transfusion
Medical/surgical procedures
IV drug use

Time

1950 1970 1990 2010
Annual incidence
Of HCV

Back-calculated past incidence of HCV

1st drop: screening of blood donors in 1990
2nd drop: awareness of at risk behaviour

S. Deuffic-Burban, expertise collective INSERM, 2003)
• 1994 :
  - estimated prevalence : 1.1 %
  - ≈ half a million individuals infected with HCV in France

• 2004 :
  - Probably lower
  - New estimation not yet available
Data available (2)

Exposure to HCV

Time (years)
Time (years)
5 to 20 years

Exposure to HCV

Data available (2)

Diagnosis

No diagnosis
Data available (2)

Exposure to HCV

Time (years)

5 to 20 years

Diagnosis

0.5 to 5 years

Referred to hepatologist

Followed up by GP

Lost for follow up

No diagnosis

Hospital as out- or inpatient

Private practice
Time (years)

5 to 20 years

0.5 to 5 years

Exposure to HCV

No diagnosis

Data available (2)

Followed up by GP

Lost for follow up

Private practice

Diagnosis

Referred to hepatologist

Hospital as out- or inpatient

End of live
Data available (2)

Exposure to HCV

Diagnosis

5 to 20 years

Followed up by GP

0.5 to 5 years

Referred to hepatologist

Lost for follow up

Private practice

End of life

Hospital as out- or inpatient

No diagnosis

Estimation of incidence in particular at risk groups
**Data available (2)**

**Exposure to HCV**

- Time (years)
  - 5 to 20 years
  - 0.5 to 5 years

**Diagnosis**
- Followed up by GP
- Referred to hepatologist
- Hospital as out- or inpatient
- End of live
- Lost for follow up
- Private practice
- Registers

**Estimation of incidence in particular at risk groups**

- No diagnosis
Data available (2)

Exposure to HCV

- No diagnosis
  - Followed up by GP
  - Referred to hepatologist

- Diagnosis
  - Hospital as out- or inpatient
  - End of live

- Registers
- System of surveillance Reference centres-InVS

Time (years)
- 5 to 20 years
- 0.5 to 5 years

Estimation of incidence in particular at risk groups

Lost for follow up

Private practice
Data available (2)

Exposure to HCV

Time (years)
- 5 to 20 years
- 0.5 to 5 years

Diagnosis

- Followed up by GP
- Referred to hepatologist
- Hospital as out- or inpatient
- End of live
- Lost for follow up
- Private practice
- System of surveillance Reference centres-InVS
- Statistics of mortality (INSERM)
- Registers

Estimation of incidence in particular at risk groups

No diagnosis
Current incidence of HCV infection

- Recipients of blood products: residual risk ≈ 0
- Nosocomial (/iatrogenic) transmission: cannot be easily quantified (screening in hemodialysis units)
- IVDU: ≈ 10% seroconversions / p.y
  2,700 to 4,400 new infections/year
- Mother-infant transmission*:
  - 3.8% (95% CI: 0.8-6.8%) in monoinfected mother,
  - 10.9% (95% CI: 4.1-22.3) in mothers coinfected with HIV
  - ≈ 300 neonates infected at birth
- Transmission in sexual partners
  - No French large series available
  - Recent cases of acute hepatitis C in HIV +ve homosexual men

* : E. Mariné-Barjoan, personal communication
## Characteristics of patients referred to the reference centres (2000-02)

(n = 10,228)

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex ratio</td>
<td>1.29</td>
<td>1</td>
</tr>
<tr>
<td>Age &lt; 45 y.o</td>
<td>63 %</td>
<td>46 %</td>
</tr>
<tr>
<td>Potential source of infection*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- transfusion</td>
<td>25 %</td>
<td>40 %</td>
</tr>
<tr>
<td>- drug use</td>
<td>60 %</td>
<td>27 %</td>
</tr>
<tr>
<td>- nosocomial</td>
<td>16 %</td>
<td>20 %</td>
</tr>
<tr>
<td>- no identified risk factor</td>
<td>13 %</td>
<td>14 %</td>
</tr>
</tbody>
</table>

* : not exclusive, total > 100 %
Characteristics of patients referred to the reference centres (2000-02)

• **Clinical stage at referral:**
  - Normal ALT : 20 %
  - Cirrhosis : 11 % (2 % decompensated)
  - Hepatocellular carcinoma : 1 %
  - Acute hepatitis : 37 cases in 3 ans

• **HCV genotype distribution (n = 5218):**

![HCV genotype distribution chart]

- 1ns
- 1a
- 1b
- 2
- 3
- 4
- 5 or 6
### Characteristics of patients referred to tertiary hospitals: comparison of 2 periods 1991-93 vs 2000-02

<table>
<thead>
<tr>
<th>Route of transmission</th>
<th>1991-93 (%)</th>
<th>2000-02 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfusion</td>
<td>37.0</td>
<td>31.5</td>
</tr>
<tr>
<td>Drug use</td>
<td>24.7</td>
<td>45.6</td>
</tr>
<tr>
<td>Nosocomial</td>
<td>14.9</td>
<td>17.8</td>
</tr>
<tr>
<td>Not identified</td>
<td>20.4</td>
<td>13.1</td>
</tr>
</tbody>
</table>

### Severity of the disease

<table>
<thead>
<tr>
<th>Disease</th>
<th>1991-93 (%)</th>
<th>2000-02 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cirrhosis</td>
<td>21.4</td>
<td>10.6</td>
</tr>
<tr>
<td>(13.2 % among patients with elevated ALT)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatocellular carcinoma</td>
<td>0.9</td>
<td>0.97</td>
</tr>
</tbody>
</table>

F. Roudot-Thoraval, Hepatology 1997;26:485-90

E. Delarocque-Astagneau, BEH 2003; 16-17 90-93
HCV genotypes and sources of infection (2000-2001) (n = 1662)

C Payan et al, J viral Hepatitis (in press)
Relationship between genotypes and period of exposure (2000-01)

(n= 985)

PERIOD OF EXPOSURE TO HCV

C Payan et al, J Viral Hepatitis (in press)
HCV - HIV coinfections

Estimations in France

≈6 % of HCV+ve patients are HIV+ve

≈ 20 % of HIV+ patients are HCV +ve

30,000 coinfected patients
Patients recently referred to HCV reference centres (2001-2002)

<table>
<thead>
<tr>
<th></th>
<th>HIV +ve</th>
<th>HIV -ve</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(314)</td>
<td>(7848)</td>
</tr>
<tr>
<td>Sex ratio M:F</td>
<td>2.9:1</td>
<td>1.25:1</td>
</tr>
<tr>
<td>Age &lt;45 years</td>
<td>83 %</td>
<td>55 %</td>
</tr>
<tr>
<td>Alcohol consumption</td>
<td>33 % &gt;60g</td>
<td>25 % &gt;40g</td>
</tr>
<tr>
<td>Route of transmission</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- transfusion : M - F</td>
<td>7 % - 26 %</td>
<td>24 % - 39 %</td>
</tr>
<tr>
<td>- IVDU : M - F</td>
<td>68 % - 68 %</td>
<td>59 % - 26 %</td>
</tr>
<tr>
<td>Clinical stage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- normal ALT</td>
<td>9 %</td>
<td>20 %</td>
</tr>
<tr>
<td>- cirrhosis</td>
<td>16 %</td>
<td>11 %</td>
</tr>
</tbody>
</table>
Causes of death in HIV infected patients (2000, n= 924)

Lewden C et al, BEH 2004
Death associated with chronic hepatitis per 100,000 population, by gender, France, 1979-1998. Source: CépiDC-INSERM

J.C. Desenclos, Genève 2002
Deaths associated with HCV infection, according to age and gender (France 1997)

Death rate/100,000

- Men
- Women
- Total

Source: CépiDC - INSERM
Prediction of mortality related to HCV

S. Deuffic-Burban et al, J Hepatol 2004
In conclusion

1. Incidence of hepatitis C has dramatically decreased in recent years
   - uncontrolled issue in DU
2. Older patients we have to cope with are:
   - in treatment failure
   - cirrhotics at risk of cancer and end stage liver disease
   - at need for transplantation
   - represent a great burden for reference centres
3. There is a need for an accurate surveillance system for a better funding allocation