Using mass media and the internet as tools to diagnose hepatitis C infections in the general population

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Public Health Service of Amsterdam, The Netherlands
Estimated number of adults (aged 15-79 years) living with HCV antibodies in the Netherlands, per main subgroup, 2009

Overall prevalence for the population aged 15-79 years: 0.22% (min 0.07%, max 0.37%)
28,100 HCV-infected individuals (min n=9600, max n=48000)

Vriend, Epidemiol Infect 2012
Overall aim:

To evaluate whether a hidden population of HCV-infected individuals can be identified through a public media campaign alongside an internet risk assessment and low-threshold blood screening procedure.
HIP details

- Pilot project in the Netherlands
- Amsterdam and South Limburg
- Aim: to test ~6,000 individuals at risk for HCV infection
HIP strategy

1. Public, regional media campaign
HIP strategy

1. Public, regional media campaign

2. Tailored HCV risk assessment questionnaire at WWW.HEPTEST.NL

Questionnaire was evaluated before its online use in a study among liver patients with known HCV status (before HIP):

Sensitivity: 84.6%
Specificity: 63.8%
1. Public, regional media campaign
2. Tailored HCV risk assessment questionnaire at [WWW.HEPTEST.NL](http://WWW.HEPTEST.NL)
3. Free and anonymous blood test
HIP strategy

1. Public, regional media campaign
2. Tailored HCV risk assessment questionnaire at WWW.HEPTEST.NL
3. Free and anonymous blood test
4. Free and anonymous confirmation test at the Public Health Service
5. Direct referral to a specialist at the hospital
Additional online services

1. Free email and/or SMS reminder for blood testing
2. Online planning tool to set goal intentions for blood testing
3. Free email and/or SMS alert when the test’s result could be obtained online
Evaluation studies

1. The use and feasibility of the test service
2. The efficacy of the service in tracing HCV-infected individuals
3. The perceived usability and acceptability of the service
Methods


Use and feasibility:
  number of website visitors, completed risk questionnaires, advice compliant participants, results obtained

Efficacy:
  Number of diagnosed HCV-infected individuals, referrals to hospital, treated patients
Methods

Usability and acceptability study

- Additional online questionnaire, offered to all participants who completed the risk assessment

- Measures (5-points scales):
  - Usability: ‘ease of use’ (n=4, $\alpha=0.81$) and ‘usefulness’ (n=5, $\alpha=0.89$)
  - Acceptability of online risk test (n=4, $\alpha=0.87$)
  - Acceptability of a hypothetical paper&pencil risk test (n=4, $\alpha=0.92$)
Results: Usage

40,902 website visitors

9,653 completed the risk assessment questionnaire

26.4% (2,553 / 9,653) at risk of HCV

Elsewhere 25.0% (1,073/4,285)
Amsterdam 28.3% (993/3,507)
South Limburg 26.0% (477/1,837)
Unknown A’dam or S-L 41.7% (10/24)

Referred to GP for HCV testing

1,480 were offered blood testing
<table>
<thead>
<tr>
<th>Reported HCV risk</th>
<th>N=1480</th>
</tr>
</thead>
<tbody>
<tr>
<td>Having received blood (products) prior to 1992</td>
<td>628(42.4)</td>
</tr>
<tr>
<td>Non-injecting illicit drug use for $\geq 3$ times a week during a period of $\geq 3$ months</td>
<td>342 (23.1)</td>
</tr>
<tr>
<td>Medical/dental surgery in medium- to high-risk countries$^a$</td>
<td>209(14.1)</td>
</tr>
<tr>
<td>Living together for $&gt;1$ year and sharing bathroom items with HCV-infected individuals or IDU</td>
<td>164(11.1)</td>
</tr>
<tr>
<td>Ritual intervention such as a circumcision or scarification in medium- to high-risk countries$^a$</td>
<td>141 (9.5)</td>
</tr>
<tr>
<td>Tattoo in medium- to high-risk countries$^a$</td>
<td>134(9.1)</td>
</tr>
<tr>
<td>Former IDU</td>
<td>62(4.2)</td>
</tr>
<tr>
<td>Needle-stick injury with needle of high-risk people (IDU, hemophiliacs, dialysis patients, HCV-infected individuals)</td>
<td>41 (2.8)</td>
</tr>
<tr>
<td>Exposure of healthcare workers to blood/tissue in medium- to high-risk countries$^a$</td>
<td>41 (2.8)</td>
</tr>
<tr>
<td>HCV-infected mother</td>
<td>40(2.7)</td>
</tr>
<tr>
<td>Body-piercing in medium- to high-risk countries$^a$</td>
<td>36 (2.4)</td>
</tr>
<tr>
<td>Being born in a HCV-endemic country</td>
<td>28 (1.9)</td>
</tr>
<tr>
<td>Having received blood (products) in medium-to high-risk countries$^a$</td>
<td>14 (0.9)</td>
</tr>
<tr>
<td>Mother is/was IDU</td>
<td>12 (0.8)</td>
</tr>
<tr>
<td>Needle-stick injury in HCV-endemic countries</td>
<td>6 (0.4)</td>
</tr>
</tbody>
</table>
1,480 were offered blood testing

28.4% (420/1,480) printed the referral form and visited the laboratory for testing

12/15 HCV RNA positive
Determinants of test advice compliance

- Older age
- Higher educational level
- Residence in South Limburg compared to Amsterdam
- Living near a laboratory
- Not having health insurance
- Having subscribed to the reminder service
- HCV risk group
1,480 were offered blood testing

28.4% (420/1,480) printed the referral form and visited the laboratory for testing

95.5% (401/420) obtained test result online

3.6% (15/420; 95%CI=2.1-5.7) tested HCV ab positive

12/15 HCV RNA positive
Risk factors and clinical follow-up of chronically infected persons

Self-reported risk factors:
- 11/12 former injection drug use
- 1/12 blood transfusion prior to 1992

Clinical follow-up (2010):
- 3 reached SVR
- 3 were under treatment
- 4 were awaiting new treatment options
- 2 were lost to follow-up
Results: U&A study

- 2,154/9,653 (22.3%) individuals participated in the usability and acceptability study

- Females, older aged, and testing-advice-adherent participants were significantly more willing to participate in the usability & acceptability study
## Results (n=2,154)

<table>
<thead>
<tr>
<th></th>
<th>Mean score 5 point scale</th>
<th>Std. deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usability: risk questionnaire’s ease of use</td>
<td>4.8</td>
<td>0.4</td>
</tr>
<tr>
<td>Usability: risk questionnaire’s usefulness</td>
<td>4.4</td>
<td>0.7</td>
</tr>
<tr>
<td>Acceptability: online risk assessment</td>
<td>4.6</td>
<td>0.6</td>
</tr>
<tr>
<td>Acceptability: hypothetical paper risk assessment</td>
<td>2.9</td>
<td>1.1</td>
</tr>
</tbody>
</table>
Conclusions (1/2)

Usability and acceptability
- Usability and acceptability as perceived by participants is high

Use and feasibility
- Testing procedure using the internet works well
- Blood test advice uptake (28%) is much higher compared to similar projects
Conclusions (2/2)

Efficacy

- Risk assessment questionnaire selects high risk groups as the HCV prevalence among testers (3.6%) is 16 times the estimated prevalence among the general Dutch population (0.22%)

- Website attracted less persons at risk of HCV than expected, and therefore the number of identified HCV infected individuals is low

- The project succeeded in identifying HCV-infected individuals who belong to hidden risk groups for HCV
Continuation

New project: HepC Test@Home
Home-based HCV RNA testing in combination with internet counseling for HIV+ MSM

- HIV+ MSM are main risk group for HCV transmission in the Netherlands
- Aim: increase earlier testing and treatment to stop transmission

- Online risk assessment questionnaire for acute HCV among HIV+ MSM (Newsum et al, manuscript in preparation)
- Home-based HCV RNA testing based on DBS samples
- Testing subscription to stimulate frequent testing
Acknowledgements

Hepatitis C Internet Project:
Hans Frantzen, Natacha Gelissen, Dorothé Baayen, prof. Gerjo Kok

The hepatitis C internet project was funded by Roche Netherlands provided an unrestricted grant for broadcasting of the television commercial Schering-Plough provided an unrestricted grant for the translation of www.heptest.nl

Public Health Service of Amsterdam
Maria Prins
Evaluation of the HCV risk assessment questionnaire

- Population: 171 liver patients (91/171, 53%, HCV positive)
- Paper version of the risk test, and questions about HCV status and perceived HCV risk
- ≥1 reported risk leads to testing advice

<table>
<thead>
<tr>
<th></th>
<th>HCV +</th>
<th>HCV -</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test advice</td>
<td>77 (84.6%)</td>
<td>29 (36.3%)</td>
<td>106</td>
</tr>
<tr>
<td>No test advice</td>
<td>14 (15.4%)</td>
<td>51 (63.8%)</td>
<td>65</td>
</tr>
<tr>
<td>Total</td>
<td>91</td>
<td>80</td>
<td>171</td>
</tr>
</tbody>
</table>

sensitivity: 84.6%
specificity: 63.8%
Example

Fictitious population of 100,000 individuals, HCV prevalence 2%:

<table>
<thead>
<tr>
<th></th>
<th>HCV positive</th>
<th>HCV negative</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test advice</td>
<td>1.692</td>
<td>35.574</td>
<td>37.266</td>
</tr>
<tr>
<td></td>
<td>(84.6%)</td>
<td>(36.3%)</td>
<td></td>
</tr>
<tr>
<td>No test advice</td>
<td>308</td>
<td>62.524</td>
<td>62.832</td>
</tr>
<tr>
<td></td>
<td>(15.4%)</td>
<td>(63.8%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2.000</td>
<td>98.000</td>
<td>100.000</td>
</tr>
</tbody>
</table>
Risk-based HCV screening

In general, higher HCV prevalence was found in studies:
- In intermediate to high HCV prevalence countries
- In psychiatric clinics
- In programs using pre-screening criteria based on HCV risk factors