Assessing the cost-effectiveness of finding cases of hepatitis C infection in UK migrant populations and the value of further research

Miners AH, Martin NK, Ghosh A, Hickman M, Vickerman P

Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

CRD summary
The study assessed the cost-effectiveness of a case-finding intervention for screening UK migrant populations for hepatitis C virus, and to estimate the value of further research. The authors concluded that an opt-out general practice case-finding intervention could be cost-effective, but that this was highly uncertain and further research was needed. The authors appeared to include the best available evidence, but some of the evidence was highly uncertain; this is appropriately reflected in the authors’ conclusion.

Type of economic evaluation
Cost-utility analysis

Study objective
The cost-effectiveness of a hepatitis C virus case-finding intervention for UK migrant populations was assessed and the value of further research estimated.

Interventions
The intervention was a hepatitis C virus case-finding intervention where Pakistani migrants registered at general practices were contacted and invited to 'opt-out' of testing for hepatitis B and C infection. Those who did not opt-out were telephoned and asked to attend a clinic for an antibody test. Individuals who tested antibody positive (Ab+) were assumed to receive a confirmatory genetic (PCR RNA) test. Individuals identified as positive for hepatitis C virus were assumed to receive an average of six months treatment with pegylated interferon and ribavirin.

The comparator was defined as the background rate of testing (no intervention).

Location/setting
UK/Primary care.

Methods
Analytical approach:
A Markov model was developed to assess the cost-effectiveness of the intervention over a life time horizon, using six-monthly cycles. The analysis was based on a previously used model structure reported in a 2007 UK Health Technology Assessment (HTA) Report (see 'Other Publications of Related Interest'). The model followed the progression of hepatitis C virus through several disease stages, and was informed by evidence from the literature. The cost perspective of the UK NHS was adopted.

Effectiveness data:
The effectiveness of the case-finding intervention for the proportion of people tested was based on a published study from London of the intervention in which 20% of eligible individuals were tested. This was assumed to be the intervention effect during the first model cycle; after this it reverted to the background probability of testing. The background rate of testing in the absence of the intervention was estimated using UK Health Protection Agency data. The antibody and PCR RNA tests were assumed to be 100% accurate.

The probabilities of moving to another hepatitis C virus disease stage were based on the 2007 UK HTA report. However, the probability of a sustained viral response and the hepatitis C virus seroprevalence rate were adjusted to
match South/British Asian values using UK Health Protection Agency data.

Monetary benefit and utility valuations:
Utility values were assigned to each hepatitis C virus disease stage in the model. The utilities came from a UK randomised controlled trial (RCT) of mild disease and a UK study of patients with latter-stage disease.

Measure of benefit:
The measure of benefit was Quality Adjusted Life Years gained (QALYs). QALYs were discounted at a rate of 3.5% per year.

Cost data:
Costs included those of the case-finding intervention, the hepatitis C virus tests, and hepatitis C virus-related treatment. Due to a lack of data, the cost of the case-finding intervention was unknown and was assumed to be £20 per eligible person. The treatment costs associated with the different hepatitis C virus health states, the antiviral treatment costs and the PCR test cost came from two published economic modelling studies. The cost of an hepatitis C virus antibody test was an assumption. Costs were reported in 2010 UK £. Prices were inflated (where necessary) using the Hospital and Community Health Services Pay and Prices Index, UK. Future costs were discounted at a rate of 3.5% per year.

Analysis of uncertainty:
Probabilistic sensitivity analysis was conducted, in which the uncertainty in every model parameter was simultaneously accounted to evaluate the uncertainty around the cost-effectiveness estimate. One-way sensitivity analyses were also conducted, varying key parameters. A value of information analysis was also conducted to assess the potential value of conducting further research.

Results
In the base case, the mean cost per person was £425 for the case-finding intervention and £373 for the non-intervention. The mean QALYs were 17.762 for the case-finding intervention and 17.759 for the non-intervention. The incremental cost-effectiveness ratio was £23,200/QALY for the case-finding intervention.

The probability that the intervention was cost-effective at a £20,000 or £30,000 per QALY threshold was between 35% and 71%. The results were sensitive to hepatitis C virus seroprevalence, the intervention effect/cost, the probability of treatment uptake, and the probability of leaving the UK. The value of information analysis indicated that further research into the probability of treatment uptake, the utility associated with sustained viral response health states, and the intervention cost would be of most value.

Authors’ conclusions
The authors concluded that an opt-out general practice case-finding intervention for screening UK migrant populations for hepatitis C virus could be cost-effective, but that this was highly uncertain and further research was warranted.

CRD commentary
Interventions:
The interventions were adequately described and usual practice was included, which would help local decision-makers.

Effectiveness/benefits:
The authors appeared to use the best-available evidence for the setting and population to inform the model parameters; there was considerable uncertainty around a few of these and this was highlighted and relevant sensitivity analyses conducted. The health benefits appeared to be fully captured in the analysis, but few details of the utility values used were reported. The authors referenced a paper instead.

The authors suggested that many general practice records did not contain up-to-date contact details, which may explain the modest uptake of testing (20%) in the London study.

Costs:
The costs included in the analysis matched the perspective adopted. The costs used in the model were well reported, but the details of how the costs were estimated were not reported. Instead, the authors referenced the source publications.
Some costs were highly uncertain as there was little information to inform them; this uncertainty was appropriately assessed in sensitivity analyses, and the results were found to be sensitive to the cost estimates.

Analysis and results:
The model was clearly reported. Appropriate sensitivity analyses were conducted to attempt to assess the impact of parameter uncertainty. As the evidence for a few parameters was sparse or absent entirely, many probability distributions were fully or partially assumed, such as uniform distributions for the percentage of people with sustained viral response, the background testing rate, and the cost of antiviral treatment. A gamma distribution was assumed for the intervention cost, which was also an assumption. There would be uncertainty in the value of information results, as a few of the probability distributions used were uncertain. There results were well reported.

Concluding remarks:
The authors appeared to find the best available evidence for the analysis. Some of the evidence was highly uncertain, and the authors' conclusion appropriately reflected this.

Funding
The research was funded by the National Institute for Health and Care Excellence (NICE), UK.

Bibliographic details
Miners AH, Martin NK, Ghosh A, Hickman M, Vickerman P. Assessing the cost-effectiveness of finding cases of hepatitis C infection in UK migrant populations and the value of further research. Journal of Viral Hepatitis 2013: epub

PubMedID
24215210

DOI
10.1111/jvh.12190

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Clinical Laboratory Techniques /economics /methods; Cost-Benefit Analysis; Emigrants and Immigrants; Great Britain; Hepatitis C /diagnosis; Humans

AccessionNumber
22013050182

Date bibliographic record published
04/12/2013

Date abstract record published
20/01/2014