Cost-effectiveness of hepatitis C virus antiviral treatment for injection drug user populations

Martin NK, Vickerman P, Miners A, Foster GR, Hutchinson SJ, Goldberg DJ, Hickman M

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 evaluated the cost-effectiveness of hepatitis C virus antiviral treatment in injecting drug users. The authors concluded that antiviral treatment for injecting drug users was likely to be a cost-effective option in hepatitis C virus prevalence scenarios of less than 60%, although further research was warranted. The methods and reporting of study were sufficient and the authors’ conclusions were appropriate.

Type of economic evaluation
Cost-utility analysis

Study objective
To evaluate the cost-effectiveness of providing hepatitis C virus antiviral treatment in injecting drug users.

Interventions
The study compared three options: treatment for injecting drug users only; treatment for ex/non-injecting drug users only; and no treatment. Treatment was peginterferon-a plus ribavirin.

Location/setting
UK/primary care.

Methods
Analytical approach:
A dynamic model was developed to simulate hepatitis C virus transmission and the preventative effects of antiviral treatment. Analyses were conducted for three baseline prevalence scenarios for chronic hepatitis C virus (20%, 40% and 60%). The time horizon was 50 years (10-year treatment programme plus 40 years of prevention benefits and associated costs). The perspective that was of a health provider.

Effectiveness data:
Epidemiological and disease progression data were taken mostly from a health technology assessment (HTA) report (see Other Publications of Related Interest) and other studies. Treatment effectiveness was derived from published studies and treatment duration by responder type and genotype derived from the NICE guidelines. Where data were absent some assumptions were made about mortality rates and sustained viral response between injecting drug and ex/non-injecting drug users.

Monetary benefit and utility valuations:
Utility weights for health states considered in the model were derived from published studies.

Measure of benefit:
The summary benefit measure was quality-adjusted life-years (QALYs) discounted at an annual rate of 3.5%.

Cost data:
Direct costs included the cost of antiviral treatment, antiviral treatment delivery (including staff time and tests) and hepatitis C virus infection-related resources. Unit costs of antiviral treatment were from the British National Formulary. Other costs were based on the HTA report (see Other Publications of Related Interest). All costs were in UK pounds.
The price year was 2010. Many of the costs were inflated from 2003/04 using the Hospital and Community Health Pay Price Index. Costs were discounted at an annual rate of 3.5%.

Analysis of uncertainty:
One-way sensitivity analysis was performed with varied key model inputs (such as sustained viral response, genotype, time horizon, discount rate, treatment number, duration and delivery costs). Multivariate probabilistic uncertainty analysis was also used in the calculation of the analysis of covariance (ANCOVA). ANCOVA was used to estimate the proportion of variation in the model outcomes explained by variation in the input parameters, which allowed a crude identification of the importance of individual parameters on overall uncertainty.

Results
Costs and benefits were synthesized using an incremental cost-effectiveness ratio (ICER) for hepatitis C virus chronic prevalence scenarios. In prevalence scenarios of 20% and 40%, treatment for injecting drug users was the most cost-effective and treatment for ex/non-injecting drug users was dominated. In the scenario of 60% prevalence, treatment for ex/non-injecting drug users was slightly more likely to be the more cost-effective option.

Full results were presented in the paper, only the results from 40% prevalence scenario are presented here:

At 40% prevalence and per 1,000 injecting drug users the costs (in £) were £40,774 for no treatment, £41,119 for treating injecting drug users and £41,316 for treating ex/non-injecting drug users. QALYs were 123,053 for no treatment, 123,217 for treating injecting drug users and 123,133 for treating ex/non-injecting drug users. The ICER of treatment for injecting drug users over no treatment was £2,539 per QALY gained.

The cost-effectiveness acceptability curves indicated that at the NICE threshold of £20,000 to £30,000 per QALY gained, treatment for injecting drug users was 100% cost-effective at 20% and 40% prevalence scenarios and treatment for ex/non-injecting drug users was 57% to 60% likely to be the more cost-effective option.

Authors’ conclusions
The authors concluded that antiviral treatment for injecting drug users was likely to be a cost-effective option in hepatitis C virus prevalence scenarios of less than 60%. Further research was warranted.

CRD commentary
Interventions:
The selection of the comparators was appropriate for patients with hepatitis C virus in the authors’ setting.

Effectiveness/benefits:
Clinical data were mostly derived from a HTA report that was a systematic review of relevant studies. Use of the source should have ensured the appropriateness of clinical evidence, but the report was from several years before and update searches may have been required to ensure that all relevant evidence was utilised. QALYs were appropriately used as the summary benefit measure as they capture the global impact of the interventions on patient health and are comparable with the benefits of other health care interventions. No details of the methods used to derive utility weights were reported, which made it impossible to assess their validity.

Costs:
The analysis of costs was consistent with the perspective and the sources were reported clearly. No details of the cost valuation and analytic approach were reported. Some relevant categories of costs were excluded and the authors provided a clear justification for this decision. Costs were presented as macro-categories, which hindered transparency and potentially generalisability. The price year was stated explicitly. All costs were adjusted and discounted appropriately.

Analysis and results:
Synthesis of costs and benefits was undertaken correctly and the issue of uncertainty was addressed satisfactorily. The results of the baseline analysis and sensitivity analyses were presented clearly and discussed. The findings were compared to and resembled those from other publications. Overall the reporting was sufficient, but lacked the detail to allow a full assessment on the validity of some components of the analysis. Despite this the conclusions were
appropriate. The conclusions included a recommendation for further research.

Concluding remarks:
The methods and reporting of study were sufficient and the authors' conclusions were appropriate.

Bibliographic details

PubMedID
21898506

DOI
10.1002/hep.24656

Original Paper URL

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Antiviral Agents /economics /therapeutic use; Cost-Benefit Analysis /statistics & numerical data; Drug Costs /statistics & numerical data; Great Britain /epidemiology; Hepatitis C, Chronic /drug therapy /economics /epidemiology; Humans; Injections, Intravenous; Interferon-alpha /economics /therapeutic use; Needles; Polyethylene Glycols /economics /therapeutic use; Prevalence; Ribavirin /economics /therapeutic use; Risk Factors; Secondary Prevention; Substance-Related Disorders /economics /epidemiology; Syringes

AccessionNumber
22012000486

Date bibliographic record published
22/02/2012

Date abstract record published
30/05/2012