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ORIGINAL ARTICLE

Cost-effectiveness analysis of two treatment strategies for chronic hepatitis C before and after access to direct-acting antivirals in Spain[☆]

Juan Turnes^{a,*}, Raquel Domínguez-Hernández^b, Miguel Ángel Casado^b

^a Complejo Hospitalario Universitario de Pontevedra, Instituto de Investigación Sanitaria Galicia Sur, Pontevedra, Spain

^b Pharmacoeconomics & Outcomes Research Iberia (PORIB), Madrid, Spain

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KEYWORDS

Direct-acting antiviral;
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Abstract

Objective: To evaluate the cost-effectiveness of a strategy based on direct-acting antivirals (DAAs) following the marketing of simeprevir and sofosbuvir (post-DAA) versus a pre-direct-acting antiviral strategy (pre-DAA) in patients with chronic hepatitis C, from the perspective of the Spanish National Health System.

Methods: A decision tree combined with a Markov model was used to estimate the direct health costs (€, 2016) and health outcomes (quality-adjusted life years, QALYs) throughout the patient's life, with an annual discount rate of 3%. The sustained virological response, percentage of patients treated or not treated in each strategy, clinical characteristics of the patients, annual likelihood of transition, costs of treating and managing the disease, and utilities were obtained from the literature. The cost-effectiveness analysis was expressed as an incremental cost-effectiveness ratio (incremental cost per QALY gained). A deterministic sensitivity analysis and a probabilistic sensitivity analysis were performed.

Results: The post-DAA strategy showed higher health costs per patient (€30,944 vs. €23,707) than the pre-DAA strategy. However, it was associated with an increase of QALYs gained (15.79 vs. 12.83), showing an incremental cost-effectiveness ratio of €2439 per QALY. The deterministic sensitivity analysis and the probabilistic sensitivity analysis showed the robustness of the results, with the post-DAA strategy being cost-effective in 99% of cases compared to the pre-DAA strategy.

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* Corresponding author.

E-mail address: jturnesv@gmail.com (J. Turnes).

PALABRAS CLAVE

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Hepatitis C crónica;
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Análisis coste-efectividad

Conclusions: Compared to the pre-DAA strategy, the post-DAA strategy is efficient for the treatment of chronic hepatitis C in Spain, resulting in a much lower cost per QALY than the efficiency threshold used in Spain (€30,000 per QALY).

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Análisis coste-efectividad de dos estrategias de tratamiento para la hepatitis C crónica: antes y después del acceso a los agentes antivirales de acción directa en España

Resumen

Objetivo: Análisis coste-efectividad de una estrategia basada en antivirales de acción directa (AAD) a partir de la comercialización de simeprevir y sofosbuvir (post-AAD) frente a otra previa (pre-AAD), en pacientes con hepatitis C crónica, desde la perspectiva del Sistema Nacional de Salud.

Métodos: Se realizó un árbol de decisión combinado con un modelo de Markov para estimar los costes directos sanitarios (€, 2016) y resultados en salud (años de vida ajustados por calidad, AVAC), a lo largo de toda la vida del paciente, con una tasa de descuento anual del 3%. La respuesta virológica sostenida, el porcentaje de pacientes tratados o no en cada estrategia, las características clínicas de los pacientes, las probabilidades anuales de transición, los costes del tratamiento y manejo de la enfermedad, y las utilidades se obtuvieron de la literatura. El análisis coste-efectividad se expresó como relación coste-efectividad incremental (coste incremental por AVAC ganado). Se realizaron análisis de sensibilidad determinísticos y probabilístico.

Resultados: La estrategia post-AAD mostró mayores costes sanitarios por paciente (30.944€ vs. 23.707€) que la estrategia pre-AAD. Sin embargo, se asoció con un aumento de la ganancia de AVAC (15,79 vs. 12,83), mostrando una relación coste-efectividad incremental de 2439€ por AVAC. Los análisis de sensibilidad mostraron la consistencia de los resultados siendo la estrategia post-AAD, frente a pre-AAD, coste-efectiva en el 99% de los casos.

Conclusiones: La estrategia post-AAD, en comparación con la pre-AAD, es eficiente para el tratamiento de la hepatitis C crónica en España, obteniéndose un coste por AVAC muy inferior al umbral de eficiencia utilizado en España (30.000€ por AVAC).

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Introduction

Infection by the hepatitis C virus (HCV) is characterized by the difficulty of the immune system to eliminate the virus in the acute phase, which leads to the development of chronic hepatitis C (CHC) in more than 70% of patients.¹ Among these, depending on various factors, chronic liver damage can lead to the development of liver cirrhosis in up to 25% of patients.² In most patients, this progression is slow and completely asymptomatic, but once liver cirrhosis has developed, the annual probability of developing clinical decompensations of cirrhosis is 4%, and that of developing hepatocellular carcinoma (HCC) is 1.5%,³ which may eventually lead to the need to receive a liver transplant or the patient's death.

The actual prevalence of CHC in Spain is not well known, but it is estimated that CHC affected 473,000 people in Spain in 2013.⁴ The magnitude of these figures reveals that CHC is a major socio-sanitary problem in Spain that entails a significant consumption of economic resources for health systems, with regard to both the evident need for treatments to cure

the HCV infection and the costs derived from the treatment of the complications of liver disease.⁵

The sustained virologic response (SVR) for treating the HCV infection prevents disease progression, reduces hepatic mortality and all-cause mortality, and increases patients' quality of life.^{6,7} The treatment of the disease has changed radically in recent years due to the availability of direct-acting antivirals (DAAs) that act in combination on different key therapeutic targets for virus replication, allowing SVR rates that exceed 95% in most patients. These treatment regimens, mostly free of interferon, are given orally and have a shorter duration than the alternatives used previously, a better tolerability profile, and greater adherence to treatment.⁸⁻¹¹

On the other hand, the use of these new DAA regimes is associated with an increase in the economic impact on short-term health system budgets. This increase is fundamentally related to the significant increase in the number of patients who are eligible to receive treatment because of their excellent safety profile, in addition to the associated cost of the drugs themselves.

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