Health outcomes and costs associated with the implementation of a national treatment Plan for Hepatitis C in Spain

Juan Turnes[1], Raquel Domínguez-Hernández[2], Miguel Ángel Casado[2]

[1] Department of Gastroenterology and Hepatology, Complejo Hospitalario Universitario de Pontevedra, Instituto de Investigación Sanitaria Galicia Sur, Pontevedra, Spain; [2] Pharmacoeconomics & Outcomes Research Iberia (PORIB), Madrid, Spain

AASLD THE LIVER MEETING® 2017 WASHINGTON, DC OCTOBER 20-24

Background

- The availability of oral direct-acting antivirals (DAAs) has changed the paradigm of the disease and treatment management of chronic hepatitis C (CHC).
- In 2015, to ensure access to treatment in a sustainable way for the healthcare system, the National Strategic Plan for Chronic Hepatitis C (SPCHC) was implemented in Spain[1].

Objective

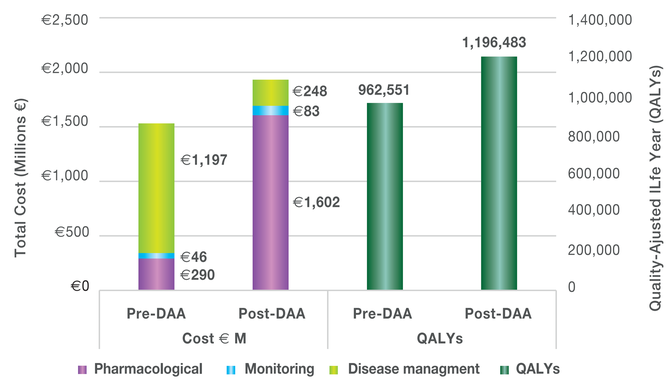
Our objective was to evaluate the long-term healthcare benefits and economic outcomes of the SP-CHC implementation during 2015-2016 compared to previous CHC management, in Spain.

Methods

- A published decision-analytic Markov model[2] representing the natural history of CHC was used to simulate the progression of a cohort of 66,777 patients[3] (mean age 52 years)[4], comparing health outcomes and costs before (pre-DAAs) and after (post-DAAs) access to DAAs following the approval of the SPCHC.
- In the post-DAA strategy, DAAs from the commercialization of simeprevir and sofosbuvir were included. In pre-DAA strategy, previously available regimens based on double or triple therapy with peg-interferon plus ribavirin and telaprevir or boceprevir were considered.
- During 2015-2016, 100% of patients were treated using the post-DAA strategy[3]. For the same period, 29% of patients would have been treated with the pre-DAA strategy[5].
- The clinical characteristics for the distribution of patients according to genotype [74.5% (GT1), 2.0% (GT2), 12.2% (GT3) and 11.2% (GT4)], fibrosis degree [1.0% (F0), 9.9% (F1), 25.0% (F2), 22.1% (F3) and 41.8% (F4)], and treatment status [66.6% naïve and 33.4% previously treated patients] were obtained from Spanish public sources[3].
- Sustained virological responses (SVR) rates according to clinical characteristics were 95-98%[3] in post-DDA strategy and 48-78% in pre-DAA, these were obtained from clinical trials or the most relevant studies of each treatment included. Untreated patients progressed according to the natural history of the disease.
- Transition probabilities[6-12] and utilities[7] were extracted from the published literature.
- Average treatment cost per patient in the post-DAA strategy (€24,167)[13] was estimated from Spanish public resources, based on the investment made in DAAs and total patients treated during the two years. In pre-DAA strategy, treatment costs (€15,003)[14] were calculated from the perspective of the National Health System.
- Treatment monitoring cost[15] and cost associated with the management[11,15] of liver complications were obtained from the literature.
- From Spanish National Health System perspective, the model adopted a lifetime horizon and costs and health outcomes were discounted at 3% per annum[16]. Outcomes included quality-adjusted life-years (QALY), healthcare costs (€, 2016), and incremental cost-utility ratios (ICUR).
- One-way sensitivity analyses (OWSA) were performed modifying SVR rates, proportion of cirrhotic patients, percentage of patients treated in pre-DAA strategy, probability of receiving liver transplantation, pharmaceutical and healthcare costs.
- The willingness-to-pay thresholds considered were: €20,000, €25,000 and €30,000, per QALY gained[17-18].

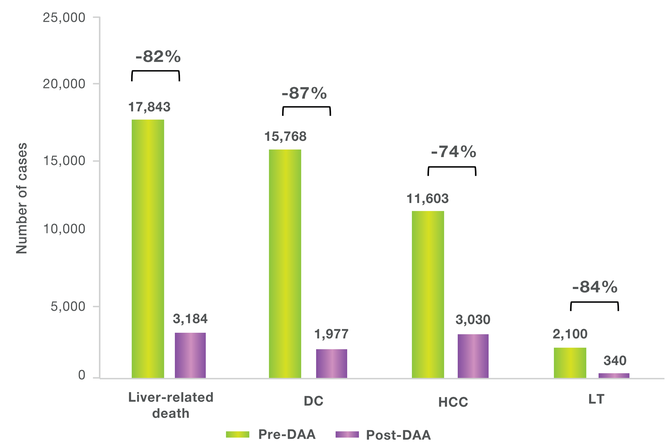
Results

Figure 1. Results of the analysis for the cohort of 66,777 patients



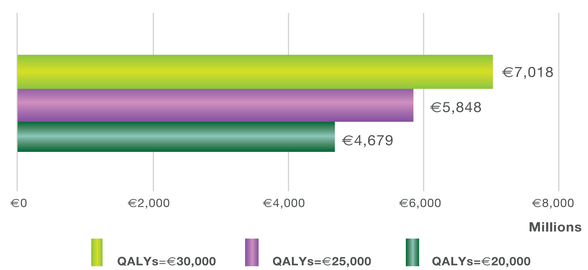
- In the post-DAA strategy compared to pre-DAA strategy, there was a gain of 3.5 QALYs per patient (post-DAA, 17.9 QALY versus pre-DAA, 14.4 QALY) with an incremental cost of €5,088 (post-DAA, €28,935 versus pre-DAA, €22,947) resulting in an ICUR of €1,709 per patient.
- For all cohorts of patients, the post-DAA strategy demonstrated a higher effectiveness than pre-DAA (233,932 QALYs), and lifetime total costs of €1,932M and €1,532M with post-DAA and pre-DAA, respectively (Figure 1).

Figure 2. Clinical events avoided



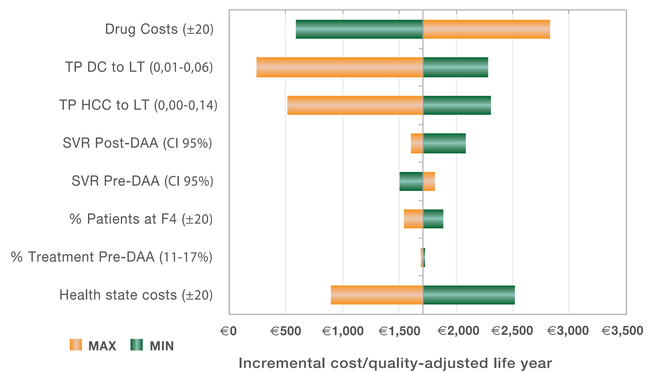
- The post-DAA strategy was associated with a reduction of 13,791 cases of decompensated cirrhosis (CD), 8,573 cases of hepatocellular carcinoma (HCC) and 1,760 liver transplantations (LT), which would save €112M, €144M and €425M respectively. In addition, liver-related mortality events were reduced by 14,659 (Figure 2).

Figure 3. Estimation of monetary value of QALYs gained



- The monetary value of the incremental QALY achieved with the post-DAA versus pre-DAA strategy across the cohort of patients, ranged from 4,679 to 7,018 million euros, assuming a willingness to pay between 20,000 and 30,000 euros per QALY, which far exceeds the cost increase (Figure 3).

Figure 4. One-way deterministic sensitivity analyses: Tornado Diagram



- OWSA confirmed the robustness of the results. The most influential parameters were drug costs and the probability of LT (Figure 4).

Conclusion

SPCHC implementation during 2015-2016 is estimated to improve healthcare outcomes, such as reduced liver related morbidity (-87% cases of decompensated cirrhosis, -74% cases of hepatocellular carcinoma and -84% liver transplantations) and the number of liver related deaths (-82%), improving also CHC patients' health related quality of life. It has been achieved in a cost-effective manner and could serve as an example to other countries.

References

1. National Strategic Plan for Chronic Hepatitis C. 2015. MSSSI. Available from: http://www.msssi.gob.es; 2. Turnes J, et al. Gastro Hepatol 2017;40:433-446; 3. Información del PEACH C en el Sistema Nacional de Salud. MSSSI. Available from: http://www.msssi.gob.es; 4. Buti M, et al. Rev Esp Quimioter. 2015;28:145-53; 5. Razavi H, et al. J Viral Hepal.2014;21 Suppl 1:34-59; 6. Buti M, et al. J Hepatol. 2005;42:639-45; 7. Chahal.et al.JAMA.2015;176:65-73; 8. Ferrante SA, et al. BCM Infectious Diseases. 2013;13:190; 9. Maylin S, et al. Gastroenterology. 2008; 135:821-9.; 10. Saab S, et al. Liver Transpl. 2010;16:748-59; 11. San Miguel R.et al.GUT 2014;64:1277-88; 12. Younossi ZM.et al. Aliment Pharmacol Ther 2015;41:544-63; 13. Ministerio de Hacienda y Administraciones Públicas. Available from: http://www.mineco.gob.es; 14. BOT Plus. Available from: http://www.portalfarma.com; 15. Buti M, et al. Farm Hop.2014;38:418-29; 16. López Bastida J, et al. Gac Sanit. 2010;24;154-70.; 17. Vallejo-Torres L. Available from: http://www3.gobiernodecanarias.org/; 18. Sacristán JA, et al. Gac Sanit 2002;16:334-43.

Study funded by GILEAD

Designed by [porib] pharmacoeconomics & outcomes research iberia