COST-EFFECTIVENESS ANALYSIS OF HEPATITIS B VIRUS SCREENING TO PREVENT HEPATITIS B VIRUS REACTIVATION IN PATIENTS RECEIVING RITUXIMAB BASED CHEMOTHERAPY FOR HEMATOLOGIC MALIGNANCY

PÓSTER FRI-131

Buti M[1], Crespo J[2], Esteban R[1], Torres C[3], Oyagüez I[3], Casado MA[3]
[1]Hospital Universitari Vall d'Hebrón, Barcelona, Spain; [2]Hospital Universitario Marqués de Valdecilla, Santander, Spain; [3]Pharmacoeconomics & Outcomes Research Iberia, Madrid, Spain

Introduction

- Patients with hematologic malignancy under chemotherapy may be at particularly high risk of hepatitis B virus (HBV) reactivation[1].
- HBV screening can identify patients who could benefit from antiviral prophylaxis to avoid this reactivation[2].

Objective

The aim was to assess the short-term cost-effectiveness of HBV screening in patients with hematologic malignancy before undergoing chemotherapy, from the third-party payer perspective.

Methods

- A decision tree model was developed to compare the costs and effectiveness of the following strategies (Figure 1) for a 18-months period.
  - **HBV screening**, before R-CHOP chemotherapy
  - **HBV non-screening**
- Health outcome was the number of HBV reactivation avoided.
- Patients testing HBsAg+ or/and antiHBc+ plus HBV-DNA were administered oral antiviral prophylaxis, since chemotherapy starting until 1 year after completion of chemotherapy.
- In those non-screening patients, TDF was dosed only if HBV reactivation occurred.
- Probabilities for outcomes derived from literature[3-15]. (Table 1)

Table 1: Probabilities

	Probability (%)	
HBsAg+ prevalence	1.30%[3-6]	
AntiHBc+ prevalence in HBsAg- patients	11.10%[3-6]	
ADN-VHB+ prevalence in HBsAg-/antiHBc+	4.70%[6,7]	
	HBV screening	**No HBV screening***
HBV reactivation in HBsAg+ patients	0.00%[7]	57.30%[10,-12]
Non liver-related mortality in HBsAg-/antiHBc+/ADN-VHB+ patients without reactivation	0.00%[7]	7.80%[9]
Risk of Hepatitis in HBsAg+ following reactivation	0.00%[7]	27.50%[12,13]
Liver-related mortality in HBsAg+ patients following reactivation	7.70%3,[8]	40.00%[10]
Non liver-related mortality in HBsAg+ patients following reactivation	7.80%[9]	9.90%[9]
HBV reactivation in HBsAg-/antiHBc+/ADN-VHB- patients	13.30%[8]	
Non liver-related mortality HBsAg-/antiHBc+/ADN-VHB- patients without reactivation	7.80%[9]	
Risk of Hepatitis HBsAg-/antiHBc+/ADN-VHB- patients, following reactivation	0.00%[8]	58.80%[8]
Liver-related mortality in HBsAg-/antiHBc+/ADN-VHB- patients, following reactivation	14.30%[15]	
Non liver-related mortality in HBsAg-/antiHBc+/ADN-VHB- patients, following reactivation	9.90%[9]	
HBV reactivation in HBsAg-/antiHBc+/ADN-VHB+ patients	0.00%[7]	19.10%[14]
Non liver-related mortality in HBsAg-/antiHBc+/ADN-VHB+ patients without reactivation	7.80%[9]	
Risk of Hepatitis in HBsAg-/antiHBc+/ADN-VHB+ patients, following reactivation	0.00%[7]	58.80%[8]
Liver-related mortality in HBsAg-/antiHBc+/ADN-VHB+ patients, following reactivation	7.70%[7]	40.00%[10]
Non liver-related mortality in HBsAg-/antiHBc+/ADN-VHB+ patients, following reactivation	7.80%[9]	9.90%[9]
Non liver-related mortality in HBsAg-/antiHBc- patients	7.80%[9]	

*Non diagnoses or diagnosed following bad evolution

Methods

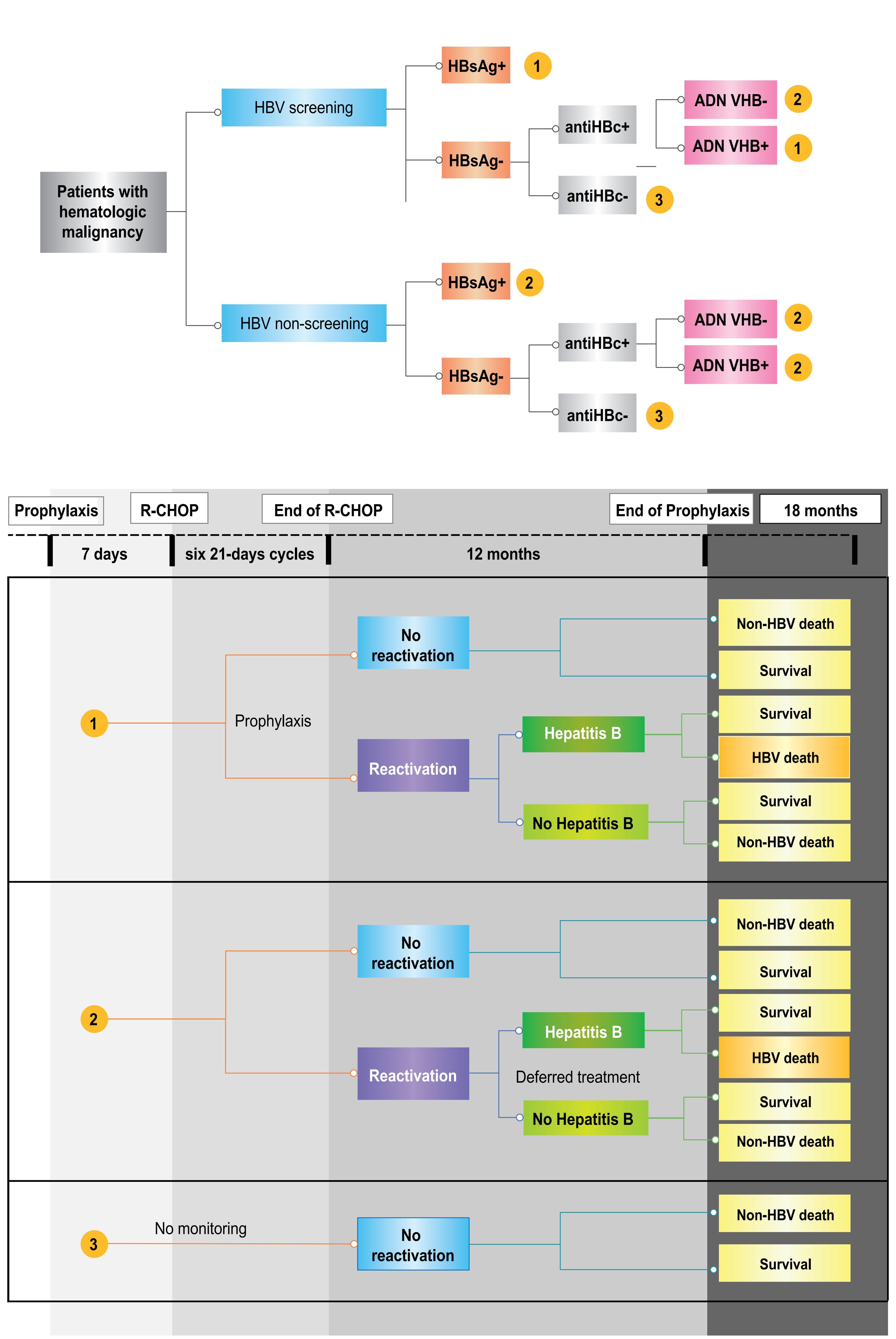
- Total costs (€, 2015) included direct medical resources (Table 2):
  - Oral antiviral prophylaxis
  - R-CHOP chemotherapy
  - HBV screening tests (based on HBsAg, antiHBc and HBV-DNA tests)
  - Liver function (bilirubin and transaminases) tests
  - Clinical events

Table 2: Unitary Costs (€, 2015)

		Cost
Antiviral prophylaxis - Tenofovir DF (300 mg once daily)[16]		€ 8.90*/day
R-CHOP chemotherapy (six 21-day cycles)**[16]		€ 1,380.42*/cycle
Procedures (€/procedure)[17]	HBsAg	€ 14.60
	antiHBc	€ 10.68
	HBV-DNA	€ 103.61
	Liver function	€ 7.52
	Resistance test	€ 208.89
Procedures (€/procedure)[7]	Hepatitis	€ 3,555.29
	Death	€ 7,440.82

*published ex-factory prices[16] with mandatory deduction (RDL 8/2010)[18]
** rituximab, cyclophosphamide, doxorubicin, vincristine and prednisone

Figure 1: Model design



Results

- A hypothetical 1,000 patient's cohort was run through the model. HBV screening versus non-screening strategy avoid 7.36 reactivations (14.9 HBV reactivations versus 22.3).
- Total cost per patient (including €8,282 of R-CHOP chemotherapy) was €8,584 and €8,449 for HBV screening strategy and non-screening strategy, respectively.
- Incremental cost-effectiveness ratio (ICER) for HBV screening versus non-screening strategy was €18,376 per reactivation averted (Table 3).

Table 3: Results of cost-effectiveness

	HBV screening	HBV non-screening
Total cost/patient	**€ 8,584.39**	**€ 8,449.11**
Treatment (R-CHOP + TDF)	€ 8,376.60	€ 8,304.43
Procedures	€ 207.79	€ 89.81
Hepatitis	€ 0.00	€ 38.37
Death	€ 0.00	€ 16.51
No. reactivations/patient	0.01	0.02
No. reactivations/cohort (n=1,000 patients)	14.96	22.32
ICER (HBV screening versus HBV non-screening)	€ 18,375.97 per reactivations averted	

Conclusions

HBV screening followed of oral antiviral prophylaxis, yielded higher health benefits than non-screening, decreasing HBV reactivation in patients with hematologic malignancy undergoing R-CHOP chemotherapy.

References

[1] Hsu C, et al. Hepatology. 2014;59(6):2092-100
[2] Zurawska U, et al. J Clin Oncol. 2012;30(26):3167-73
[3] Alvarez-Suarez B, et al. Rev Esp Enferm Dig. 2010;102:542-52.
[4] Gutiérrez García ML, et al. Gastroenterol Hepatol. 2015;38(1):1-6.
[5] Yeguas A, et al. SEHH 2012; Poster 8-P.
[6] Sampedro B, et al. Hepatology. 2014;60(1):106-13.
[7] Buti M, et al. EASL, 2014; Poster 1040.
[8] Hsu C, et al. Hepatology. 2014;59(6):2092-100.
[9] Saab S, et al. Hepatology. 2007;46(4):1049-56.
[10] Viganò M, et al. Expert Opin Biol Ther. 2014;14(7):1019-31
[11] Pei SN, et al. Ann Hematol. 2010;89(3):255-62.
[12] Lau GK, et al. Gastroenterology. 2003;125(6):1742-9.
[13] Hsu C, et al. Hepatology. 2008;47(3):844-53.
[14] Kusumoto S, et al. J Gastroenterol. 2011;46(1):9-16
[15] Papadopoulos. EASL 2014
[16] Bot Plus. Available at: www.portalfarma.com
[17] eSalud. Available at: www.oblikue.com
[18] RDL 8/2010 – BOE. Available at: www.boe.es

Poster submitted to the International Liver Congress. 51st annual meeting of the European Association for the Study of the Liver (EASL).
Barcelona, April 13-17, Spain Funded by Gilead Sciences