EE191

A Budget Impact Analysis of Selective Internal Radiation Therapy using Y-90 Resin Microspheres versus Atezolizumab-Bevacizumab as First-Line Therapy in Patients with Barcelona Clinic Liver Cancer Stage C Hepatocellular Carcinoma in England

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Introduction

Background

Selective internal radiation therapy (SIRT) has a proven safety and efficacy record in patients with Barcelona Clinic Liver Cancer (BCLC) stage C hepatocellular carcinoma (HCC). In the SARAH randomized controlled trial (RCT), sub-group analysis in patients with BCLC stage C HCC in the per protocol population showed no significant difference in overall survival (OS) with SIRT versus sorafenib (HR 1.06; 95% confidence interval: 0.81–1.39); however, across all patients in the SARAH trial, SIRT patients experienced significantly higher complete and partial response rates versus sorafenib, and significantly better quality of life.[1]

In December 2020, the National Institute for Health and Care Excellence (NICE) recommended atezolizumab-bevacizumab (atezo-bev) as a first-line treatment option in adults with HCC, Child-Pugh (C-P) grade A liver impairment, and an Eastern Cooperative Oncology Group (ECOG) performance status of 0 or 1.[2]

NICE subsequently recommended SIRT using Y-90 resin microspheres as an option for treating unresectable advanced HCC in adults with C-P grade A liver impairment when conventional transarterial therapies are inappropriate.[3] SIRT is also recommended by the European Society for Medical Oncology (among other international clinical associations) for the treatment of subsets of patients with BCLC stage B and C HCC, such as those with good liver function, absence of extra-hepatic disease, and unsuitable for systemic therapy.[4] While no head-to-head trials have been conducted comparing atezo-bev with SIRT, a recent matching-adjusted indirect comparison showed similar time to deterioration in quality of life with SIRT and atezo-bev.[5]

Objective

The objective of the present study was to evaluate the budget impact of SIRT versus atezo-bev in the treatment of patients with BCLC stage C HCC in England.

Methods

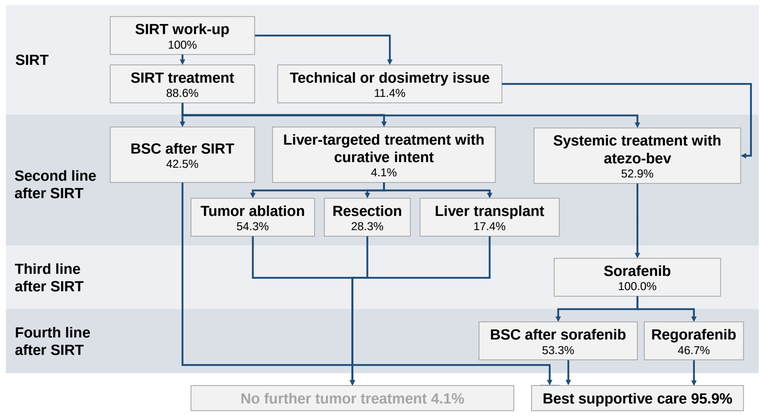
Economic Model

A budget impact model was developed in Microsoft Excel to capture costs of initial treatment, adverse events (AEs), and subsequent therapy lines. The model was structured as a Markov model with states corresponding to those in a traditional partitioned survival model (progression-free survival [PFS], post-progression survival, and death). The Markovian nature of the model facilitated derivation of transition probabilities from published arm-level data on the duration of PFS and overall survival (OS) without needing access to patient-level data. All patients started in the progression-free state on the initial treatment (either SIRT or atezo-bev) and progressed to subsequent treatment lines based on transition probabilities derived from the literature.

Clinical Data

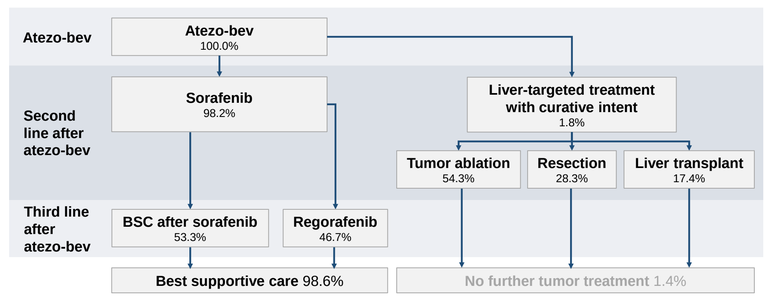
Transition probabilities were derived from published studies in HCC. For the first-line treatments, OS and PFS were based on the SARAH and IMbrave150 RCTs.[1,6]

Figure 1: SIRT treatment algorithm



BSC, best supportive care; SIRT, selective internal radiation therapy.

Figure 2: Atezolizumab-Bevacizumab treatment algorithm



BSC, best supportive care.

Treatment Sequencing

The sequence of treatments after first-line treatment with SIRT or atezo-bev was informed based on expert opinion (Figure 1 and Figure 2). After SIRT, it was assumed that patients would either receive best supportive care (BSC), systemic treatment with atezo-bev, or a treatment with curative intent (liver transplant, resection, or ablation). The proportions undergoing curative intent treatments were aligned with the proportions ultimately receiving curative intent treatments in the SARAH trial.[1] After progression on atezo-bev after SIRT, it was assumed that all patients would receive sorafenib followed by either regorafenib or BSC (Figure 1).

After first-line atezo-bev, patients were assigned either to sorafenib or curative intent treatments based on the proportion ultimately receiving treatments with curative intent in the IMbrave150 RCT (Figure 2).[6]

Costs and Resource Use

Costs of SIRT using Y-90 resin microspheres were calculated from the Department of Health and Social Care (DHSC) perspective using healthcare resource tariffs from the National Tariff 2022/23.[6] Costs of atezo-bev were obtained from the British National Formulary (BNF), with administration costs based on the National Tariff. Patients were assumed to receive 1,200 mg of atezolizumab and 15 mg/kg of bevacizumab per treatment cycle, with calculations based on a mean bodyweight of 70 kg.

Comparable AE incidence data were not available from the SARAH and IMbrave150 RCTs and AE costs were therefore excluded from the analysis.

Costs of subsequent systemic treatments (sorafenib, regorafenib, ablation, resection, and liver transplant) were captured based on expert opinion and costed based on the BNF and appropriate HRG codes.

All analyses were conducted over a three-year time horizon and future costs were not discounted in line with guidance from the International Society of Pharmacoeconomic and Outcomes Research.[7]

Analyses were run both for SIRT with separate hospital spells for the SIRT work-up and the SIRT procedure and for "same stay" SIRT using the Order-Map-Treat (OMT) Program, which requires only a single hospital admission.[8]

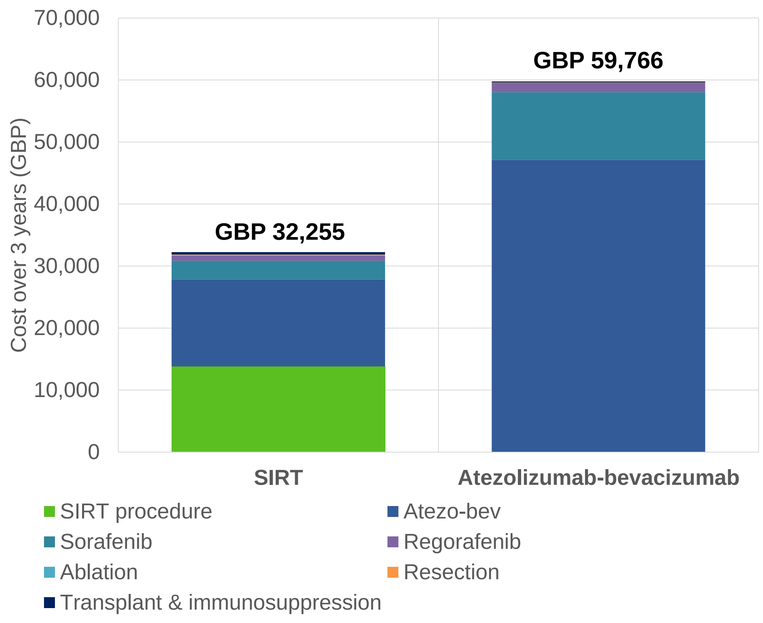
Results

Budget Impact Analysis of SIRT versus Atezolizumab-Bevacizumab in England

Over a three-year time horizon, "same-stay" SIRT resulted in cost savings of GBP 27,511 per patient versus atezo-bev (GBP 32,255 versus GBP 59,766; Figure 3), while SIRT in which the work-up was performed during a separate hospital spell was GBP 25,167 less expensive than atezo-bev per patient (GBP 34,599 versus GBP 59,766). The higher cost of SIRT in the analysis without the OMT Program was driven by the need for a separate hospital spell for the SIRT work-up procedure.

The analysis was most sensitive to list price discounts associated with atezolizumab and bevacizumab, and assumptions around time-on-treatment.

Figure 3: Base case results in 2022 pounds sterling (GBP) broken down by cost category



Conclusions

SIRT using Y-90 resin microspheres was found to be cost saving versus atezo-bev from the perspective of the DHSC in patients with BCLC stage C HCC. The main limitation of the analysis, which was unavoidable, was the lack of publicly available information on the Patient Access Schemes (PAS) for atezo-bev and SIRT. The costs would therefore not be representative of those borne by the DHSC. Nevertheless, the magnitude of the modeled cost savings with SIRT were substantial, and SIRT has other benefits, including requiring only one or two hospital visits versus numerous intravenous infusions with atezo-bev.

References

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Further information is available on request.

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