Blood 138 (2021) 4013–4015

63rd ASH Annual Meeting Abstracts

POSTER ABSTRACTS

902.HEALTH SERVICES RESEARCH-LYMPHOID MALIGNANCIES

Utility Estimation of Rituximab Versus Bendamustine-Rituximab Induction in Indolent Non-Hodgkin Lymphomas Using Patient-Reported Quality of Life Survey Data

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Abstract Background

Rituximab induction (RI) and bendamustine-rituximab (BR) induction are both options for the frontline management of indolent non-Hodgkin lymphomas (NHLs). Although BR induces longer progression-free survival than RI, BR confers more toxicity and a longer duration of initial induction than RI. The effects of RI versus BR on health-related quality of life (HRQoL) after induction treatment, and the implications on patient utility and quality-adjusted life-years (QALYs), have not been previously studied. We conducted a cost-utility analysis of RI versus BR utilizing patient-reported HRQoL survey data.

Methods

Patient-reported utility data were collected from the Hoogland Lymphoma Biobank, which enrolls patients with lymphoma at the University of Chicago and prospectively administers serial patient-level HRQoL surveys utilizing the Functional Assessment of Cancer Therapy-General (FACT-G) and FACT-Lymphoma (FACT-LYM) instruments. Patients with indolent NHLs (follicular lymphoma, marginal zone lymphoma, and lymphoplasmacytic lymphoma) who were treated with frontline RI (4 doses of weekly rituximab) or BR (6 months of monthly BR) and who had completed HRQoL surveys at both of the following timepoints were included: within 6 months of treatment completion (timepoint 1) and 6-12 months after treatment completion (timepoint 2). Individual FACT-G scores were converted into EQ-5D utility index scores using a United States-based validated mapping algorithm (Teckle et al., *Health Qual Life Outcomes*, 2013). Cost-utility analysis was performed by trial-based methodology in which patient-level QALYs are estimated using area-under-the-curve (AUC) between timepoints 1 and 2. Incremental cost utility ratio (ICUR) was calculated utilizing cost and life years gained inputs of RI and BR from previous cost-effectiveness literature. All HRQoL scores for RI versus BR at both timepoints were compared with unpaired two-tailed t-tests.

Results

There were 19 patients treated with RI and 13 patients treated with BR (**Table 1**). At timepoint 1, the BR cohort had significantly worse physical and emotional wellbeing on the FACT-G compared to the RI cohort, with emotional wellbeing significantly worse in the BR cohort at timepoint 2 (**Table 2**). EQ-5D utility index was stable at both timepoints for the RI cohort, and was initially lower in the BR cohort at timepoint 1 compared to RI but improved by timepoint 2 (**Table 2**). During the initial 12-month observation period after treatment completion, quality of life was higher for RI compared to BR (+0.02); however, when accounting for life years gained, the BR cohort had more QALYs (+1.53) (**Table 3**). Compared with RI, BR had an ICUR of $37,442.

Conclusions

Although HRQoL was inferior in the BR cohort in the first year after treatment completion, particularly in the emotional wellbeing domain on FACT-G, BR induction conferred higher QALYs owing to more life years gained as compared to RI induction. Given a cost-effectiveness threshold of $100,000 in the United States (Vanness et al., *Ann Intern Med*, 2021), BR induction is likely to be cost effective when considering patient-reported HRQoL over the first year after treatment completion. The present analysis is limited by the small number of patients from which utility values at each timepoint were derived; however, calculation of QALYs using a database of prospectively-collected HRQoL data is feasible. Further incorporation of patient-reported outcomes into cost-utility analysis is warranted, particularly with larger datasets.

Table 1. Patient characteristics.

	Rituximab induction (RI)	Bendamustine-rituximab induction (BR)
Number of patients	19	13
Median age (years)	64	60
Age range (years)	41-79	45-78
Gender		
Male (%)	9 (47)	7 (54)
Female (%)	10 (53)	6 (46)
Race and Ethnicity		
White (%)	16 (84)	11 (85)
Black (%)	3 (16)	2 (15)
Hispanic or Latino (%)	1 (5)	2 (15)
Indolent non-Hodgkin lymphoma histology		
Follicular lymphoma (%)	6 (32)	6 (46)
Marginal zone lymphoma (%)	11 (58)	4 (31)
Lymphoplasmacytic lymphoma (%)	2 (11)	3 (23)
Quality of life survey timing after treatment completion		
Timepoint 1: <6 months (median months)	4	4
Timepoint 2: 6-12 months (median months)	10	9
Comorbidities		
Presence of at least 1 comorbidity (%)	14 (74)	9 (69)
Performance status at diagnosis		
ECOG 0 (%)	13 (68)	5 (38)
ECOG I (%)	6 (32)	7 (54)
ECOG II (%)	0 (0)	1 (8)
Ann-Arbor stage at diagnosis		
Stage I-II (%)	6 (32)	4 (31)
Stage III-IV (%)	13 (68)	9 (69)

Table 2. FACT-G, FACT-LYM, and EQ-5D utility index scores for RI and BR cohorts at both timepoints.

FACT-G and FACT-LYM Subscores and Summary Scores	Timepoint 1 (<6 months)					Timepoint 2 (6-12 months)				
	RI		BR		p-value	RI		BR		p-value
	mean	SD	mean	SD		mean	SD	mean	SD	
Physical Wellbeing (PWB)	23.85	3.66	20.77	4.80	**0.048**	24.15	3.94	23.15	5.03	0.535
Social Wellbeing (SWB)	24.38	3.40	21.91	6.55	0.173	24.12	4.50	22.62	6.17	0.430
Emotional Wellbeing (EWB)	19.58	2.81	16.85	4.74	**0.049**	20.13	3.01	17.48	4.25	**0.047**
Functional Wellbeing (FWB)	20.94	6.20	18.37	6.72	0.274	22.01	6.19	19.08	6.79	0.215
Lymphoma Subscale (LYM)	47.53	13.04	46.38	9.09	0.787	48.11	13.40	46.85	10.22	0.777
FACT-G Total	88.75	12.39	77.89	19.15	0.061	89.91	15.31	82.38	20.44	0.243
FACT-LYM Total	136.27	22.95	124.28	26.80	0.185	138.02	26.27	129.23	29.53	0.384
EQ-5D Mapping	RI		BR		p-value	RI		BR		p-value
	mean	SD	mean	SD		mean	SD	mean	SD	
EQ-5D Utility Index	0.71	0.07	0.66	0.09	0.087	0.72	0.08	0.69	0.10	0.354

Table 3. Cost-utility analysis for RI versus BR cohorts.

Induction Regimen	Life years gained	Cost of Entire Induction Regimen	AUC		QALYs		ICUR ($ per QALY)
			Mean	Δ AUC	Total	Δ QALY	
RI	7.82	$38,732	0.358	--	2.80	--	Reference case
BR	12.86	$95,888	0.336	-0.02	4.32	+1.53	$37,442

Figure 1

Disclosures Smith: *Alexion, AstraZeneca Rare Disease:* Other: Study investigator; *Celgene, Genetech, AbbVie:* Consultancy.

https://doi.org/10.1182/blood-2021-151136