

Efficacy of Hyperbaric Oxygen Therapy in Hematologic Malignancy Patients: A Single Comprehensive Cancer Center Retrospective Review of 50 patients

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Background

- Hyperbaric oxygen therapy (HBO) is FDA approved for difficult-to-treat tissue injury. HBO is commonly used as a second-line treatment for refractory infection in patients with hematologic malignancies. Data on the efficacy of HBO in such population are limited.
- We reviewed and analyzed our single-center experience of HBO treatment in patients with hematologic malignancies.

Methods

We identified patients undergoing HBO treatment by retrieving insurance authorization data between December 2012 and October 2019 at the University of Texas MD Anderson Cancer Center. All patients with a diagnosis of hematologic malignancies with or without history of stem-cell transplant were included. Clinical and demographic data were collected by retrospective chart review.

Results

A total of 50 pts were included: the most common diagnosis was Acute Myeloid Leukemia (AML) in 26 pts (52%). 31 (62%) patients had received a allogeneic SCT, and 34 (68%) had active disease at the time of HBO.

The most common infections were BK cystitis (19 pts, 38%) and fungal sinusitis/pneumonia (17 pts, 34%).

The median number of HBO sessions was 5 (range 1-60), and median HBO duration was 17 days (range 0-109).

Twenty-five pts (50%) were discharged from hospital at either completion of HBO or after transition to outpatient treatment. Pts with BK cystitis were less likely to respond to HBO (OR 0.16, p=.004).

The 8 pts who achieved HBO response and remission of infection at last follow-up had a higher proportion of underlying disease in remission (50%), compared to only 29% in the 42 remaining pts.

Ninety-day and 1-year mortality were high at 52% and 78%, respectively. Median survival was 3.1 months (Figure 1).

The treatment indications include 2 BK cystitis, 2 fungal sinusitis, 2 cellulitis, and 2 non-BK cystitis. Other patient characteristics was similar to the rest of the patients. Patients with response/infection remission had better survival (HR 0.18; 95% CI 0.07-0.53, p=.002).

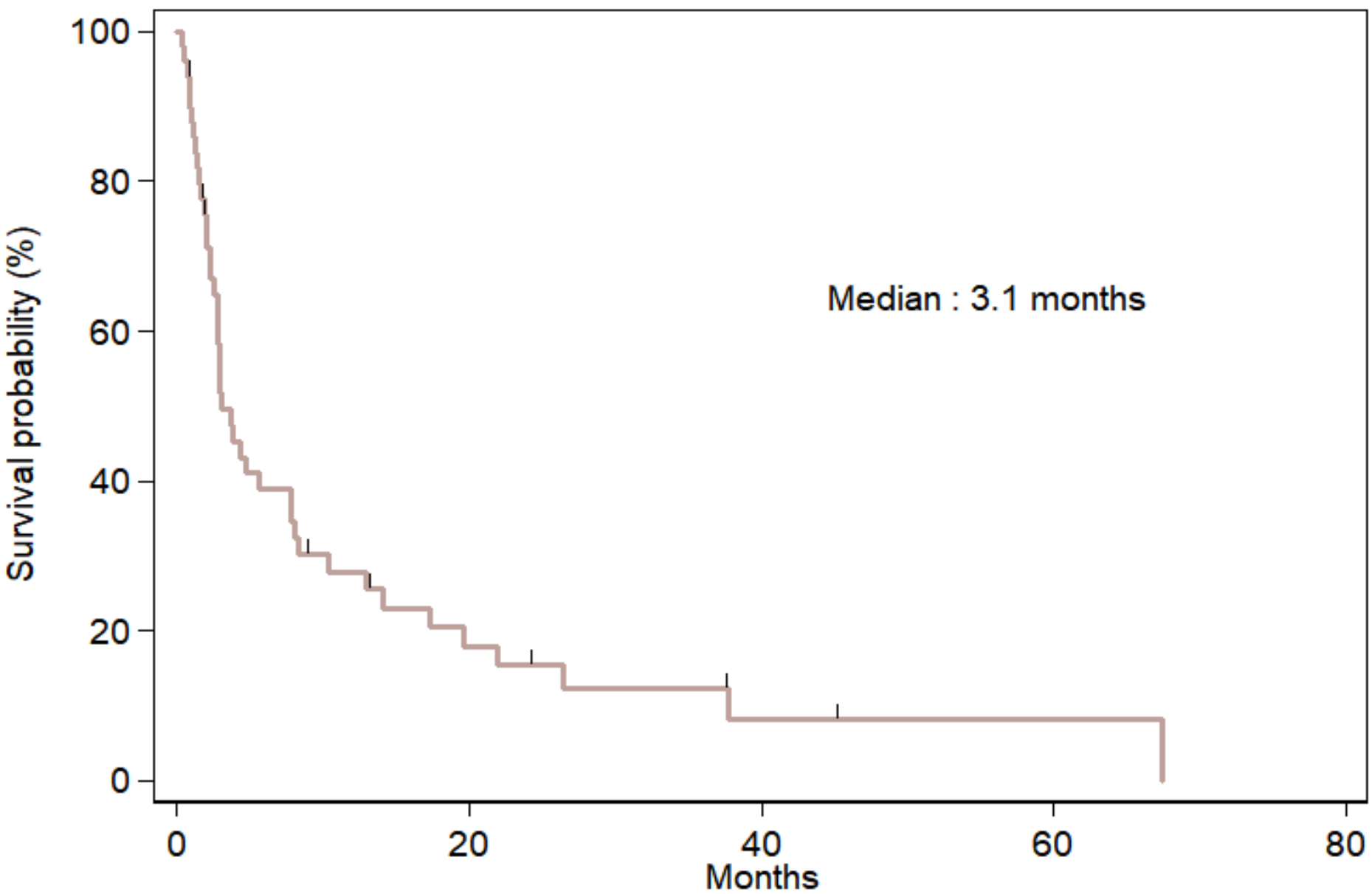


Figure 1. Overall survival in 50 pts

	All (n=50)	SCT recipient (n=31)	Non-SCT recipient (n=19)	p- value
Age, median [IQR] (days)	66 [38-65]	46 [32-54]	66 [45-74]	.004
Sex (male), n (%)	35 (70)	20 (65)	15 (79)	.280
Diagnosis, n (%)				.051
AML	26 (52)	12 (39)	14 (74)	
ALL	10 (20)	9 (29)	1 (5)	
Biphenotype leukemia	1 (2)	1 (3)	0 (0)	
MDS	5 (10)	2 (6)	3 (16)	
MPN	3 (6)	2 (6)	1 (5)	
NHL	4 (8)	4 (13)	0 (0)	
HL	1 (2)	1 (3)	0 (0)	
Post-SCT, n (%)		31 (100)		
Matched-related donor		8 (26)		
Matched-unrelated donor		11 (35)		
Haplo-matched donor		7 (23)		
Cord		3 (10)		
Autologous		2 (6)		
Time from SCT [IQR], days		98 [68-678]		
Disease status, n (%)				.004
Persistent disease	6 (12)	0 (0)	6 (32)	
In remission	16 (32)	11 (35)	5 (26)	
In relapse/refractory	28 (56)	20 (65)	8 (42)	
Type of Infection, n (%)				.002
BK-cystitis	19 (38)	16 (52)	3 (16)	
Fungal sinusitis/pneumonia*	17 (34)	9 (29)	8 (42)	
Skin infection	4 (8)	4 (13)	0 (0)	
Non-BK cystitis				
Dx of DM/hyperglycemia	31 (62)	23 (74)	8 (42)	.023

*1 fungal pneumonia

Table 1. Patient characteristics

	All (n=50)	SCT recipient (n=31)	Non-SCT recipient (n=19)	p-value
Active infection at last follow-up, n (%)	41 (82)	26 (84)	15 (79)	.660
30-day mortality	5 (10)	2 (6)	3 (16)	.285
90-day mortality	26 (52)	14 (45)	12 (63)	.216
1-year mortality	39 (78)	24 (77)	15 (79)	.899
Disposition*				.259
Discharge				
Hospice discharge	25 (50)	16 (53)	9 (50)	
Death	16 (32)	8 (27)	8 (44)	
	7 (14)	6 (20)	1 (6)	

*lost to follow-up: 2 patients

Table 2. Treatment outcomes (All patients and by SCT receipt)

Summary

A small subset of patients with hematologic malignancies, 16% in our study, had control of their infection after HBO treatment. In our experience, patients whose underlying malignancy was in remission and patients with infections other than BK cystitis had better outcomes.

Discussion

Our study demonstrated that a subset of pts with hematological malignancies and severe infections derive benefit from HBO treatment. Additional studies are ongoing to better define the pts that will obtain benefit from this treatment modality.