EE388

Real-World Healthcare Resource Utilization in Advanced Hepatocellular Carcinoma (aHCC) in Ontario, Canada

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INTRODUCTION

- Hepatocellular carcinoma (HCC) is a form of primary liver cancer associated with poor survival outcomes. In 2022, it was estimated that 3,500 patients were diagnosed with HCC and 1,650 patients have died from it in Canada (1).
- Previously, sorafenib (2) had been the standard of care for aHCC as first line (1L); lenvatinib (3) and atezolizumab+bevacizumab (4) were approved as 1L treatments as of 2020 and 2022 in Canada, respectively.
- Limited contemporaneous evidence is available on treatment patterns, clinical outcomes, healthcare resource utilization (HCRU) and costs associated with the management of aHCC in Canada.
- Our study recently reported on the treatment patterns, survival and costs (6). Here, we report our findings on the HCRU on the same aHCC cohort in Ontario, Canada.

OBJECTIVE

- This study used real-world, provincial-level data from administrative databases to understand the HCRU in aHCC patient population in Ontario, Canada (7).

METHODS

- The study included patients diagnosed with aHCC between April 2010 and March 2019 with follow-up data until March 2020.
- De novo stage IV disease and/or receipt of 1L systemic therapy were used as proxies to establish an aHCC diagnosis.
- The overall cohort was split into four subgroups based on: 1) Receipt of a 1L HCC-specific therapy; 2) Receipt of other systemic therapy but not HCC-specific (such as platinum-based chemotherapies); 3) Receipt of a locoregional therapy (LRT); and 4) No treatment.
- Descriptive statistics were used to summarize the HCRU.

RESULTS

- A total of 7,322 patients were identified using relevant HCC diagnosis codes, of which 802 met the aHCC diagnosis criteria.
- **Table 1** shows that the median age for the total cohort was 66 and that over 80% were male. The mean duration of disease (diagnosis until end of follow-up) was 1.0 year.
- **Table 2** provides the HCRU for the overall cohort (n=802) from diagnosis to death or end of follow-up. For years 1 – 3, the total number of encounters, total number of patients who used the encounter and the mean number of encounters per patient per year are presented. There is a decreasing trend for the number of hospital outpatient clinic visits over the first three years. Additionally, while the number of overall physician visits declined, the number of medical oncologist visits increased during this time period.
- **Figure 1** displays the mean number of encounters per patient per year on selected resources from diagnosis for year 1 for all patients.
- **Table 3** provides the HCRU for those patients who received a 1L HCC-specific systemic therapy (n=427) from treatment initiation to death or end of follow-up for years 1 – 3. Similar to the overall cohort, the 1L treated patients show a decreasing trend for the number of hospital outpatient clinic visits over the first three years. In contrast to the overall cohort, both the number of overall physician visits and the number of medical oncologist visits decreased from year 1 to 2 for the 1L treated patients.
- **Figure 2** displays the mean number of encounters per patient per year on selected resources from treatment initiation for year 1 in the subset of patients who were treated with 1L HCC-systemic therapy.

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TABLES AND FIGURES

Table 1: Baseline characteristics for total (N=802) and four aHCC subgroups

Variable		Total N= 802	1L HCC systemic N=427	Other systemic treatment N=36	LRT N=72	No treatment N=267
Age	Mean ± SD	65.7 ± 12.0	66.9 ± 10.9	61.3 ± 14.8	63.1 ± 15.2	65.0 ± 12.2
	Median (IQR)	66 (59 - 74)	68 (61 - 75)	63 (56 - 71)	63 (57 - 73)	64 (57 - 75)
Sex	Female	143 (17.8%)	83 (19.4%)	8 (22.2%)	11 (15.3%)	41 (15.4%)
	Male	659 (82.2%)	344 (80.6%)	28 (77.8%)	61 (84.7%)	226 (84.6%)
Charlson Comorbidity Index score†	Mean ± SD	1.84 ± 1.83	1.83 ± 1.83	2.20 ± 2.49	1.93 ± 1.83	1.81 ± 1.82
	Median (IQR)	1 (1 - 3)	1 (0 - 3)	2 (0 - 3)	1 (1 - 3)	1 (1 - 2)
No prior ablation received; n (%)		739 (92.14%)	*405 - 409	*31 - 35	32(44 .44%)	267 (100%)
No prior SBRT received; n (%)		751 (93.64%)	*410 - 414	*31 - 35	39(54.17%)	267 (100%)
No prior TACE received; n (%)		741 (92.39%)	*404 - 408	*31 - 35	35(48.61%)	267 (100%)

IQR = Interquartile range (25-75%), LRT = locoregional therapy, SBRT = stereotactic body radiation therapy, SD = standard deviation, TACE = transarterial chemoembolization. †The Charlson Comorbidity Index was first developed in 1987 by Mary Charlson and colleagues as a weighted index to predict risk of death within 1 year of hospitalization for patients with specific comorbid conditions. *Due to small cell suppression of values <5 and back calculation, only ranges of values have been included instead of actual values and no percentages.

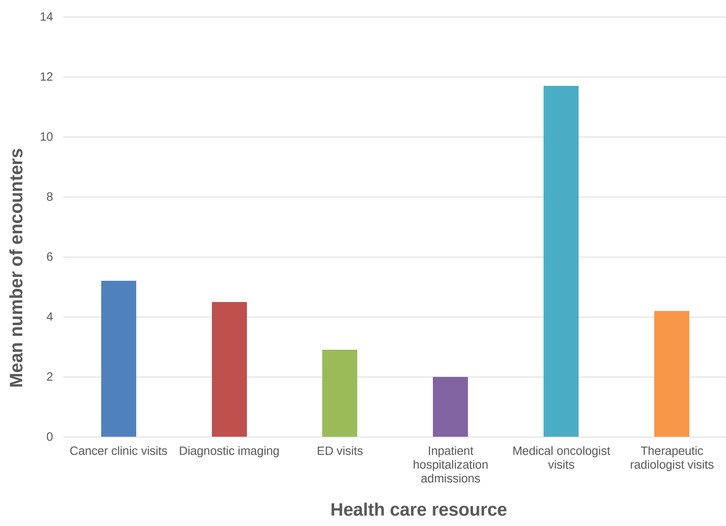
HCRU for the Overall Cohort from Diagnosis

Table 2: HCRU Encounters from Diagnosis

Type of HCRU	Year 1			Year 2			Year 3		
	Number of Encounters	Number of patients	Mean number of encounters per patient per year	Number of Encounters	Number of patients	Mean number of encounters per patient per year	Number of Encounters	Number of patients	Mean number of encounters per patient per year
Inpatient hospitalization admissions	1,211	619	**2.0**	189	101	**1.9**	60	35	**1.7**
Hospital outpatient clinic visits	7,042	777	**9.1**	1,245	174	**7.2**	403	64	**6.3**
Same day surgery admissions	216	157	**1.4**	35	28	**1.3**	23	17	**1.4**
ED visits	1,884	661	**2.9**	361	121	**3.0**	142	51	**2.8**
Cancer clinic visits	1,724	334	**5.2**	283	57	**5.0**	220	14	**15.7**
Oral medications	30,855	706	**43.7**	12,710	191	**66.5**	5,104	73	**69.9**
IV chemotherapies	58	6	**9.7**	*1-5	*1-5	**NA**	13	*1-5	**NA**
Complex & continuing care	173	101	**1.7**	53	27	**2.0**	6	*1-5	**NA**
All OHIP physician visits	83,015	800	**103.8**	15,610	214	**72.9**	6,027	77	**78.3**
OHIP GP visits	28,069	788	**35.6**	6,948	205	**33.9**	2,061	76	**27.1**
OHIP specialist visits	54,946	800	**68.9**	8,662	203	**42.7**	3,966	73	**54.3**
OHIP medical oncologist visits	5,944	510	**11.7**	1,283	103	**12.5**	504	34	**14.8**
OHIP therapeutic radiologist visits	1,456	346	**4.2**	170	51	**3.3**	66	20	**3.3**
Laboratory tests	18,490	526	**35.2**	6,257	140	**44.7**	2,585	53	**48.8**
Hepatectomy/Liver Transplant	24	18	**1.3**	0	0	**NA**	0	0	**NA**
EGD	231	160	**1.4**	37	26	**1.4**	21	14	**1.5**
TACE	80	59	**1.4**	12	9	**1.3**	*1-5	*1-5	**NA**
SBRT	198	53	**3.7**	30	8	**3.8**	0	0	**NA**
Diagnostic imaging	3,510	788	**4.5**	567	172	**3.3**	252	65	**3.9**

*1-5= Only range given due to small cell suppression; NA= not available due to calculation; ED= emergency department; EGD=esophagogastroduodenoscopy, OHIP= Ontario Health Insurance Plan; SBRT= stereotactic body radiation therapy, TACE= transarterial chemoembolization. Note that dialysis, non-physician, shadow-billing visits, and TARE were determined but not included in the table.

Figure 1: Mean Number of Encounters Per Patient Per Year on Selected HCRU from Diagnosis (Year 1)



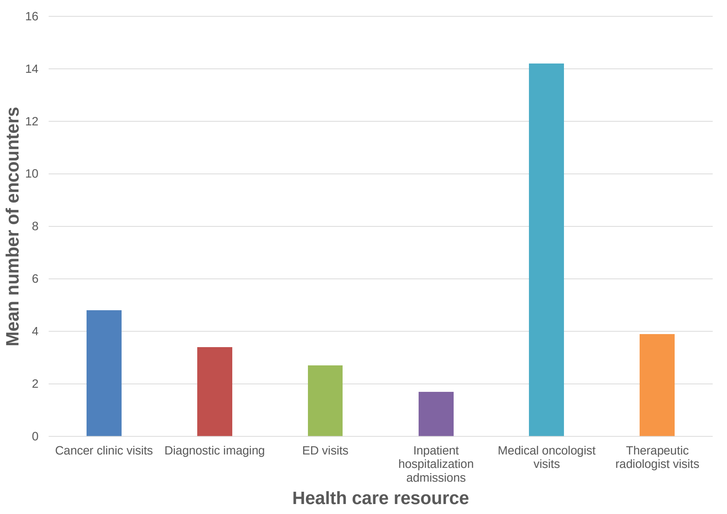
HCRU for 1L HCC Group from Treatment Initiation

Table 3: HCRU Encounters from Treatment Initiation

Type of HCRU	Year 1			Year 2			Year 3		
	Number of Encounters	Number of patients	Mean number of encounters per patient per year	Number of Encounters	Number of patients	Mean number of encounters per patient per year	Number of Encounters	Number of patients	Mean number of encounters per patient per year
Inpatient hospitalization admissions	433	261	**1.7**	73	45	**1.6**	32	16	**2.0**
Hospital outpatient clinic visits	2,986	385	**7.8**	518	80	**6.5**	143	25	**5.7**
Same day surgery admissions	63	50	**1.3**	17	10	**1.7**	*1-5	*1-5	**NA**
ED visits	844	316	**2.7**	156	65	**2.4**	80	24	**3.3**
Cancer clinic visits	900	188	**4.8**	160	23	**7.0**	49	*1-5	**NA**
Oral medications	17,628	401	**44.0**	8,354	99	**84.4**	2,236	33	**67.8**
IV chemotherapies	10	*1-5	**NA**	0	0	**NA**	0	0	**NA**
Complex & continuing care	93	54	**1.7**	19	10	**1.90**	*1-5	*1-5	**NA**
All OHIP physician visits	33,734	425	**79.4**	7,230	104	**69.5**	2,594	33	**78.6**
OHIP GP visits	13,680	407	**33.6**	3,384	102	**33.2**	924	32	**28.9**
OHIP specialist visits	20,054	418	**48.0**	3,846	100	**38.5**	1,670	30	**55.7**
OHIP medical oncologist visits	4,151	293	**14.2**	720	56	**12.9**	247	11	**22.5**
OHIP therapeutic radiologist visits	389	99	**3.9**	51	16	**3.2**	15	*1-5	**NA**
Laboratory tests	9,451	227	**41.6**	3,018	72	**41.9**	1,074	23	**46.7**
Hepatectomy/Liver Transplant	*1-5	*1-5	**NA**	0	0	**NA**	0	0	**NA**
EGD	86	50	**1.7**	18	10	**1.80**	*1-5	*1-5	**NA**
TACE	7	6	**1.2**	*1-5	*1-5	**NA**	0	0	**NA**
SBRT	38	10	**3.8**	8	*1-5	**NA**	0	0	**NA**
Diagnostic imaging	1,179	345	**3.4**	266	82	**3.2**	85	25	**3.4**

*1-5= Only range given due to small cell suppression; NA= not available due to calculation; ED= emergency department; EGD=esophagogastroduodenoscopy, OHIP= Ontario Health Insurance Plan; SBRT= stereotactic body radiation therapy, TACE= transarterial chemoembolization. Note that dialysis, non-physician, shadow-billing visits, and TARE were determined but not included in the table.

Figure 2: Mean Number of Per Patient Per Year on Selected HCRU from Treatment Initiation in 1L HCC-Systemic Treated Subgroup (Year 1)



CONCLUSIONS

- HCRU encounters for the overall cohort (n=802) from diagnosis was highest for physician visits (consisting of GP and specialists [e.g., medical oncologists, therapeutic radiologists]) yet low for inpatient hospitalizations, indicating aHCC patients are currently receiving more care on an outpatient basis.
- HCRU encounters for the 1L HCC-treated patients (n=427) from treatment initiation demonstrated similar trends as the overall cohort, with more outpatient-based care than inpatient-based care.
- The overall study demonstrates HCRU patterns of aHCC patients from the sorafenib era, and the results can be used to further contextualize the novel and emerging treatments in this therapeutic armamentarium.