A SEER-Medicare analysis of the economic burden among elderly patients with acute myeloid leukemia treated with hypomethylating agents

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Poster AML-430

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Introduction

- Acute myeloid leukemia (AML) is the most common acute leukemia affecting adults and is more common in older patients (median age at diagnosis, 68 years)[1,2]
  - In 2022, the National Cancer Institute (NCI) estimates that there will be 20,050 new cases of AML and 11,540 AML-related deaths in the United States (US)[3]
- Despite many patients achieving complete remission, relapse rates are high (> 60%), with relapses leading to low survival (median disease-free survival, 4-11 months)[4]
  - The economic burden of relapse is high, with > 77% of patients requiring hospitalization[5]
- Hypomethylating agents (HMAs) are frequently used to treat older or high-risk patients who are ineligible for intensive chemotherapy[6]
- In this study, we assessed healthcare resource utilization (HCRU) and costs associated with AML phases among older adult patients who received only HMA monotherapy during induction and then achieved remission

Methods

Data source

- This retrospective analysis used data from Medicare claims (Parts A, B, and D from 2007-2016) and the US NCI Surveillance, Epidemiology, and End Results (SEER) database (cancer diagnoses from 2007-2016)

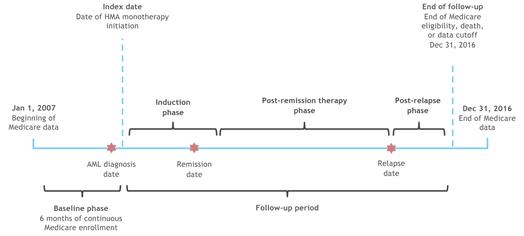
Patients

- This analysis included patients with AML aged ≥ 65 years at diagnosis who initiated only HMAs in the outpatient (OP) setting during the first induction cycle post-diagnosis and had evidence of remission post-initiation of induction therapy
  - Patients were excluded if they had another blood malignancy, received hematopoietic stem cell transplantation (HSCT), or were enrolled in a clinical trial
  - The index date was defined as the date of HMA monotherapy initiation

Study design

- The study was conducted during the baseline (6 months pre-index), induction (first HMA initiation post-diagnosis to end of the cycle in which remission occurred), post-remission (remission to earliest relapse or end of follow-up), and post-relapse (first AML relapse to end of follow-up) phases (**Figure 1**)
  - End of follow-up was defined as death or end of either eligibility or available data (data cutoff date, December 31, 2016)

Figure 1. Study design



Analysis

- Baseline patient characteristics and treatment patterns were summarized descriptively
- HCRU and costs were reported for the induction, post-remission, and post-relapse phases
  - HCRU was assessed by number of patients with healthcare encounters (ie, inpatient [IP] stays, OP visits, and blood transfusions) and length of IP stay
  - Costs were calculated with an average per-patient monthly (PPM) metric adjusted to 2019 US dollars (USD) for IP stays, OP visits, emergency room visits, and pharmacy
  - HCRU and costs associated with induction and post-remission therapy were assessed during each treatment cycle within the relevant phase

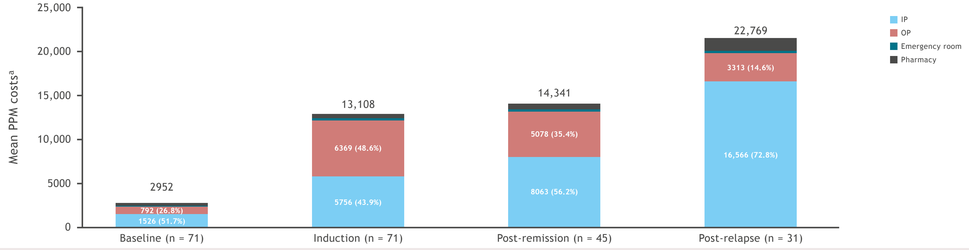
Results

Patient selection

- Among the 20,073 patients with an AML diagnosis in the SEER database, 71 were selected for analysis (**Figure 2**)

In older adult patients with AML who initiated HMAs only (ie, not other chemotherapies) during the first induction cycle and achieved remission, PPM healthcare total costs were highest during the post-relapse phase, followed by the post-remission and induction phases **(Figure 3)**

Figure 3. Costs during induction, post-remission, and post-relapse phases



[a]Percentages were calculated based on the total cost in 2019 USD.

Figure 2. Patient selection[a]

20,073 patients with a diagnosis of an AML subtype of interest[b]
↓
18,195 patients without diagnosis of a blood malignancy other than AML at any time[b]
↓
17,947 patients without diagnosis of AML identified via autopsy or death certificate
↓
14,637 patients aged ≥ 65 years at diagnosis
↓
14,636 patients with consistent death dates in SEER and Medicare data (within 3 months)
↓
14,218 patients without evidence of HSCT at any time
↓
4967 patients with ≥ 1 chemotherapy relevant ICD-9/10 code in the month of index or within 14 days of the month post-index[c]
↓
1878 patients with continuous eligibility[d] (except due to disability or ESRD) 6 months pre-index or 1 month post-index
↓
1662 patients not enrolled in a clinical trial 12 months post-index
↓
530 patients with ≥ 1 ICD-9/10 code for AML remission post-index
↓
127 patients received HMA only during the first induction cycle
↓
71 patients with no history of MDS pre-index

[a]Patient data were sourced from the SEER-Medicare database (January 1, 2007-December 31, 2016). [b]Excluded blood malignancies were any malignancies of the blood, bone marrow, and hematopoietic systems (including excluded AML subtypes) that were not an AML subtype of interest. Diagnoses for MDS and chronic myeloid leukemia were allowed prior to the diagnosis of AML. [c]Day of diagnosis is unavailable in the SEER database. [d]Defined as continuous enrollment in Medicare Parts A, B, and D, without enrollment in a health maintenance organization.
ESRD, end-stage renal disease; ICD-9/10, International Classification of Diseases, ninth/tenth revision; MDS, myelodysplastic syndrome.

Baseline patient characteristics

- At AML diagnosis, patients had a mean age of 78.8 years, 50.7% were male, 85.9% were white, and morbidity was high (mean Charlson comorbidity index [CCI] score, 3.2; **Table 1**)

Table 1. Baseline patient characteristics

	Patients (n = 71)
Mean age at AML diagnosis, years (SD)	78.8 (6.3)
Sex, n (%)	
Male	36 (50.7)
Female	35 (49.3)
Race, n (%)	
White	61 (85.9)
Black	4 (5.6)
Asian/Pacific Islander	4 (5.6)
Hispanic or Latino	1 (1.4)
North American Native	0 (0.0)
Other/unknown	1 (1.4)
Mean CCI score (SD)	3.2 (1.6)
AML subtype as of index date, n (%)	
AML not otherwise specified	51 (71.8)
AML with myelodysplasia-related changes	7 (9.9)
Acute myelomonocytic leukemia	4 (5.6)
Other	9 (12.6)
HMA received, n (%)	
Azacitidine	31 (43.7)
Decitabine	40 (56.3)

SD, standard deviation.

Treatment patterns

- Mean time from index date to the end of follow-up was 16.0 months (SD, 12.3)
- Mean total number of treatment days was 181.3 and 153.0 during the induction and post-remission phases, respectively
- After remission, 63.4% (n = 45) of patients received therapy
- Among all patients, 43.7% (n = 31) relapsed and 85.9% (n = 61) had died by the end of follow-up

HCRU

- OP visits were the most common healthcare encounter across all phases, with 100.0%, 95.6%, and 83.9% of patients having ≥ 1 visit during the induction, post-remission, and post-relapse phases, respectively (**Table 2**)
- IP stays were more common during the post-relapse phase, with 77.4% of patients having ≥ 1 IP stay compared with 67.6% and 53.3% of patients during the induction and post-remission phases, respectively (**Table 2**)
- During the induction, post-remission, and post-relapse phases, 91.5%, 77.8%, and 77.4% of patients, respectively, received a blood transfusion (**Table 2**)

Table 2. HCRU

	Induction (n = 71)	Post-remission (n = 45)	Post-relapse (n = 31)
Patients with healthcare encounters, n (%)			
IP stay	48 (67.6)	24 (53.3)	24 (77.4)
OP visit	71 (100.0)[a]	43 (95.6)	26 (83.9)
Blood transfusion	65 (91.5)	35 (77.8)	24 (77.4)
Mean length of IP stay, days (SD)	2.5 (3.9)	3.8 (7.5)	6.3 (9.3)

[a]Inclusion criteria for this study required initiation of induction therapy in the OP setting.

PPM healthcare costs

- Mean total costs were approximately 1.7 and 1.6 times higher during the post-relapse phase ($22,769) than during the induction ($13,108) and post-remission phases ($14,341), respectively (**Figure 3**)
  - OP costs were the greatest contributor to total costs during the induction phase (48.6%), whereas IP costs were the greatest contributor during the post-remission (56.2%) and post-relapse (72.8%) phases
    - The study requirement stipulating that treatment must be initiated in the OP setting likely contributed to the high proportion of OP costs in the induction phase
  - IP costs accounted for a much larger proportion of total costs during the post-relapse phase than during the induction or post-remission phases

Limitations

- These results may not be generalizable to all patients with AML
  - Patients in this analysis were limited to those with 6 months of continuous coverage prior to the index date, so patients who had intermittent coverage were not included
  - Patients who received chemotherapy or any non-HMA treatment during the first induction cycle or those who received an HSCT were also excluded
- This study used diagnostic and treatment codes, which are designed for administrative purposes, may not be driven by clinical factors, and may be entered incorrectly by healthcare providers

Conclusions

- In this SEER-Medicare analysis, the economic burden of patients with AML treated only with HMAs was highest during the post-relapse phase, with PPM healthcare total costs approximately 1.7 and 1.6 times higher than during the induction and post-remission phases, respectively
  - Mean total costs were similar during the induction and post-remission phases (i.e., < 10% greater during the post-remission phase than during the induction phase)
  - IP costs accounted for a much larger proportion of total costs during the post-relapse phase (73%) than during the induction (44%) or post-remission (56%) phases
- This study highlights the need for therapies that can extend the duration of the post-remission phase and reduce the economic burden of AML

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Acknowledgments

- This study was supported by Bristol Myers Squibb (Princeton, NJ)
- All authors contributed to and approved the presentation
- Writing and editorial assistance were provided by David M. Jensen, PhD, Mark Palangio, MS, and Michele Salernitano of Ashfield MedComms, an Inizio company, funded by Bristol Myers Squibb
- For questions please visit: www.globalbmsmedinfo.com

Disclosures

A McBride
- Employee and stockholder
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