End-of-Life Cost and Characteristics of Acute Myeloid Leukemia Decedents: A National Study From 2011-2020

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INTRODUCTION

- In comparison to end-of-life (EOL) costs for patients with solid tumors, those with hematologic malignancies require more intensive care and have a shorter hospice stay, resulting in increased EOL care expenses[1)2)].
- This study aims to identify the economic burden associated with end-of-life (EOL) care in Acute Myeloid Leukemia (AML) patients, a hematologic malignancy recognized for its substantial end-of-life costs.

METHODS

- **Study design**: Longitudinal retrospective cohort study as described in Figure 1.
- **Data source**: Health Insurance Review and Assessment Service (HIRA) Database covering the entire patients with claims history of AML in Korea from Jan 2008 to Aug 2020
- **Study population**
  - The decedents who were newly diagnosed with AML since January 2010 and had claims records for at least one year until their date of death, with the maximum follow-up time point being August 2020. The population selection flow was described in Figure 2.
- **End-of-life cost:** EOL cost was defined as the total costs of any healthcare utilization under the national health insurance system and uninsured items were not included.
- **Definition of death:** The coded death in the treatment results was considered as death and the date of coded death was defined as the date of the death.
- **Statistical analysis**
  - Continuous variables were summarized using medians with ranges and means with standard deviations (SD)and categorical variables were presented as counts and proportions.
  - To assess differences between groups, we employed t-tests for continuous variables and chi-square tests for categorical variables and ANOVA for more than two categories.
  - The costs were estimate per patient cost in USD.
  - Statistical analysis was performed using SAS® Enterprise guide version 9.4.

Figure 1. Study Design

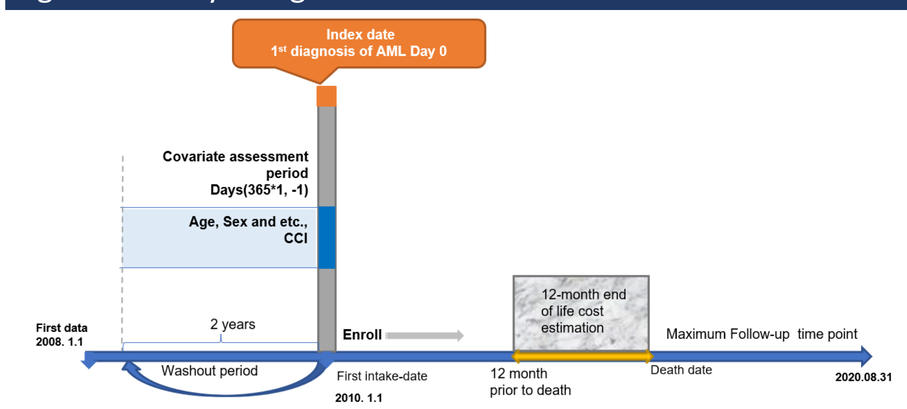
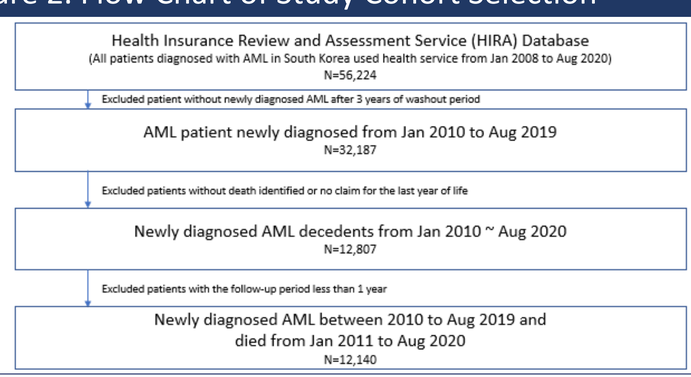


Figure 2. Flow Chart of Study Cohort Selection



RESULTS

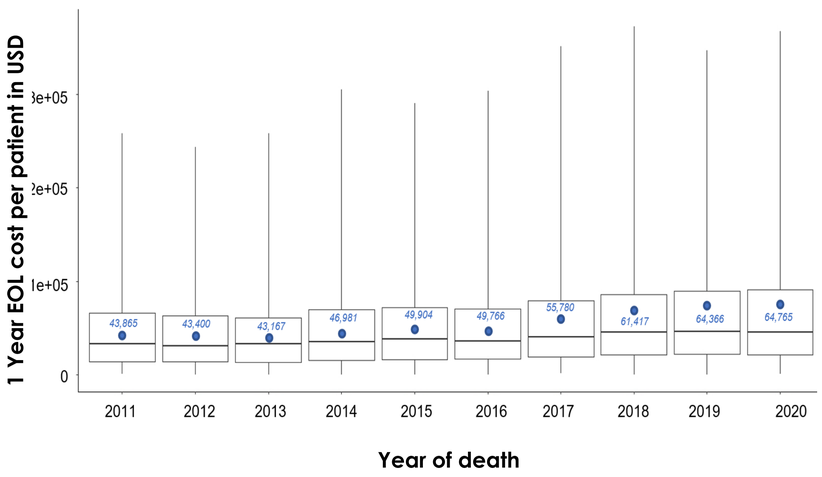
Table 1. Baseline Characteristics of Cohorts

	Total n	Total %	P-value
No. Cohort	12,140	100.00	
Year of death			
2011	833	6.85	
2012	1,020	8.40	
2013	1,055	8.69	
2014	1,113	9.17	
2015	1,196	9.80	
2016	1,402	10.95	-
2017	1,428	11.15	
2018	1,476	11.52	
2019	1,576	12.31	
2020	1,041	8.13	
Sex			
Male	7,016	57.79	<0.0001[1)]
Female	5,124	42.21	
Age(mean, std)	62.30 (19.02)		
<65	5,425	44.69	<0.0001[1)]
≥65	6,715	55.31	
HSCT			
Yes	1,253	10.32	<0.0001[1)]
NO	10,887	89.68	
Type of HCO			
Tertiary	6,618	54.51	<0.0001[2)]
Secondary	4,000	36.33	
Primary	1,486	9.16	
Hospice use			
Yes	495		<0.0001[1)]
No	1,1640		
CCI (mean, sd)	4.19(2.85)		
0	621	5.12	
1	1,157	9.53	<0.0001[2)]
2	1,844	15.19	
≥3	8,518	70.16	
Insurance Type			
Health insurance	1,1281	92.92	
Medicare	836	6.89	<0.0001[2)]
Veterans	23	0.19	

* HCO, Healthcare organization
1) P-value estimation with Chi-square test
2) P-value estimation with ANOVA teat

Figure 3. Average 1 Year EOL Cost per Patient by Year

- There was an upward trend from $43,865 in 2011 to $64,765 in 2020, representing an annual increase of 5% over the decade.



Note: Blue dot presents the mean 1 year EOL cost per patient

Figure 4. Average 1 Year EOL Cost per Patient by Characteristics

- Patients with a history of HSCT had EOL costs 2.15 times higher, while patients who used hospice care or received care from non-tertiary healthcare organizations had significantly lower EOL costs compared to others.

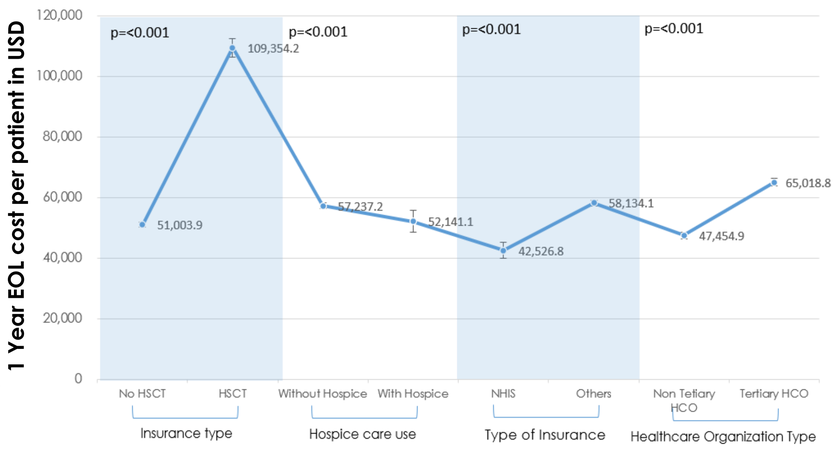
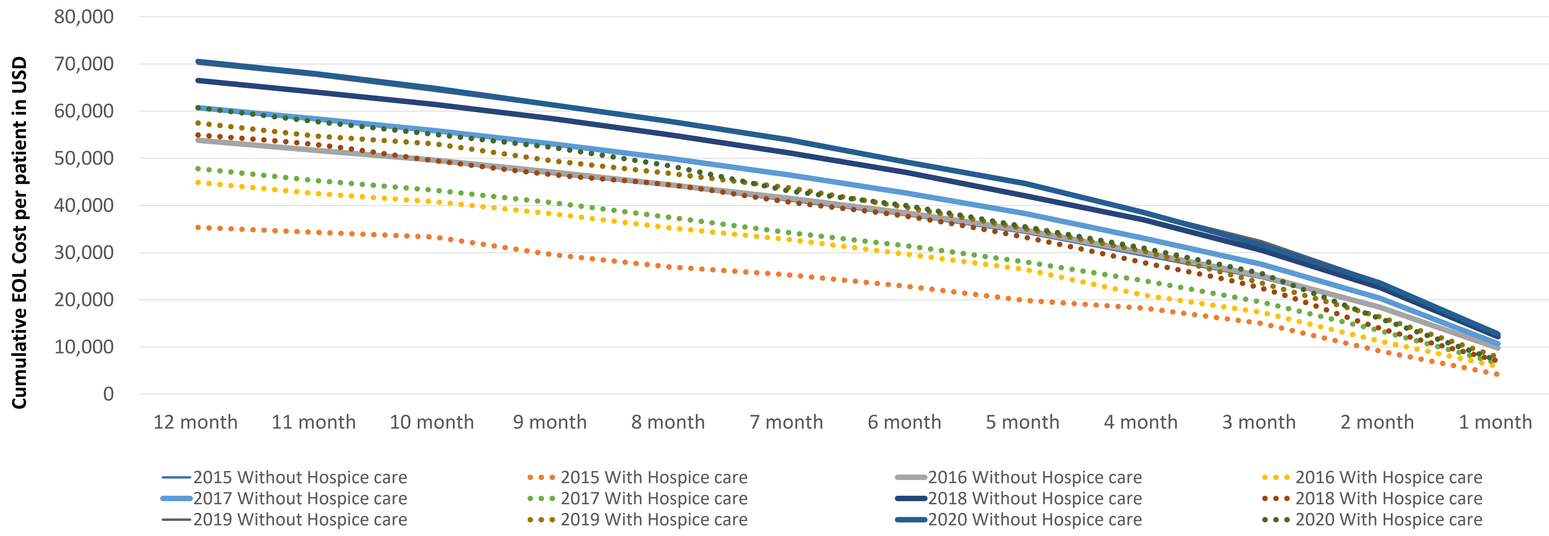


Figure 5. Cumulative EOL Cost per AML Decedent by Hospice Care Use

- AML decedents who utilized hospice care at the end of life, showed a significant reduction in cumulative end-of-life costs, observed consistently from 12 months to the end of their lives.



CONCLUSIONS

- End-of-life costs increased by approximately 50% over the decade.
- Notably, AML patients who received less intensive care, such as treatment without HSCT, hospice care, and care at non-tertiary hospitals, incurred lower end-of-life costs during the year preceding their death.
- Therefore, it is essential to optimize the intensity of care at the end of life and nee to seek policy support for end-of-life optimization choices.

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2) *Vaughn, D.M., et al., Factors associated with health care utilization at the end of life for patients with acute myeloid leukemia. Journal of palliative medicine, 2022.* ***25****(5): p. 749-756.*