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POSTER ABSTRACTS

637.MYELODYSPLASTIC SYNDROMES - CLINICAL AND EPIDEMIOLOGICAL

Red Blood Cell Transfusion Dependence Is Associated with Greater Healthcare Resource Utilization, Higher Medical Cost, and Poorer Prognosis in Patients with Lower-Risk Myelodysplastic Syndromes: A 28-Year Retrospective Observation Study Result

Jun Ho Jang[1], *Ji-Hyun Kim*[2], *Kyungah Lee*[3], *Eugene Kim*[4], *Hyojin Kim*[4], *Fangyuan Wang*[5]

[1] Department of Hematology-Oncology, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, Korea, Republic of (South)
[2] Medical Affairs, Bristol Myers Squibb Korea, Seoul, Korea, Republic of (South)
[3] Market Access, Bristol Myers Squibb Korea, Seoul, Korea, Republic of (South)
[4] RWE, Syneos Health Korea, Seoul, Korea, Republic of (South)
[5] Data Analytics RWE, Syneos Health China, Beijing, China

Myelodysplastic syndromes (MDS) encompass a heterogeneous group of myeloid neoplasms characterized by cytopenia due to inefficient hematopoiesis, with a considerable risk of progression to acute myeloid leukemia (AML) or early mortality. In lower-risk MDS (LR-MDS) patients, anemia and its associated complications have been the focus of clinical attention. A significant portion of these patients eventually develop red blood cell transfusion dependence (RBC TD), which has been linked to a poorer prognosis. Given the limited efficacy of available treatments in reducing RBC TD, most patients face increased risks of chronic anemia and various complications. Moreover, RBC TD is known to be associated with reduced overall survival (OS) and leukemia-free survival (LFS). This study aimed to assess the impact of RBC TD on the socioeconomic burden and clinical prognosis of LR-MDS patients, utilizing an electronic medical records (EMR) database spanning nearly 30 years of MDS patient data.

This retrospective observational study examined adult MDS patients (≥ 18 years of age) treated at Samsung Medical Center in the Republic of Korea. Eligible patients were diagnosed with MDS between Sep 1, 1994, to Apr 1, 2022 (index period), with the observation period spanning from Sep 1, 1994, to Sep 1, 2022. Baseline assessments included estimation of revised international prognostic scoring system (IPSS-R) scores, categorizing patients with very low, low or intermediate risks as lower-risk MDS (LR-MDS). TD was defined as the occurrence of any 16-week period with RBC transfusion of ≥ 2 units per 8 weeks, without consecutive 56-day period without transfusion. Healthcare resource utilization (HCRU), medical costs, and prognosis indicators including overall survival (OS) and AML-free survival (AFS) were analyzed and compared between patients who experiencing TD and those not (non-TD).

Out of 831 MDS patients, 349 (42.0%) were classified as lower-risk at baseline. Among LR-MDS patients, 29.5% (103/349) experienced TD while 23.3% (194/831) experienced TD in the entire study population. The median age at diagnosis of MDS was 63 (ranging from 18 to 89), and 65.3% (543/831) were male. In LR-MDS patients, there were no significant differences in either baseline age (61 vs 63, P=0.16) or gender (71.8% vs 61.0% males, P=0.053) between TD and non-TD groups. However, TD group exhibited significantly higher median erythropoietin (EPO) level than non-TD group (290.5U/L vs. 112U/L, P<0.001) among LR-MDS patients with available baseline serum EPO levels (76 TD and 178 non-TD). Among the 76 TD LR-MDS patients with baseline serum EPO levels, 51 (67.1%) exhibited > 200U/L, which is considered a clinical threshold for erythropoiesis-stimulating agent (ESA) treatment.

As shown in Table 1, RBC TD was consistently associated with greater HCRU and higher medical costs, especially in LR-MDS patients. TD LR-MDS patients had higher rates of outpatient department and emergency room visits (15676 vs. 8303 visits and 587 vs. 328 visits per 1000 person-years [PY], respectively), and increased hospitalizations (709 vs. 456 per 1000 PY), with longer hospital stays (13343 vs. 8272 days per 1000 PY). Furthermore, TD LR-MDS patients required over four-times of packed RBC units than non-TD patients (31107 vs. 7073 units per 1000 PY). Consequently, TD LR-MDS patients incurred higher total medical cost than their non-TD counterpart (13.5 million vs. 6.1 million USD per 1000 PY). Median OS (58.4 months vs. 103.1 months) and AFS (52.7 months vs. 102.7 months) were both significantly shorter in the TD group compared to the non-TD group among LR-MDS patients, while the differences in OS and AFS did not reach the level of significance in the entire

study population (Table 1 and Figure 1). Notably, median OS after the first documented RBC TD event was 33.8 months (95% confidence interval: 24.7-58.5 months) in LR-MDS patients.
The findings of this study indicate that RBC TD can be a strong predictor of increased HCRU and medical costs, as well as decreased OS and AFS over a 20-year period following the initial diagnosis of LR-MDS. Given that a majority of LR-MDS patients experiencing TD may not be eligible for ESA treatment due to elevated EPO levels exceeding 200U/L, and the use of cytotoxic agents is not usually recommended for these patients, these results highlight a substantial unmet need for alternative treatment options to address RBC TD in LR-MDS patients.

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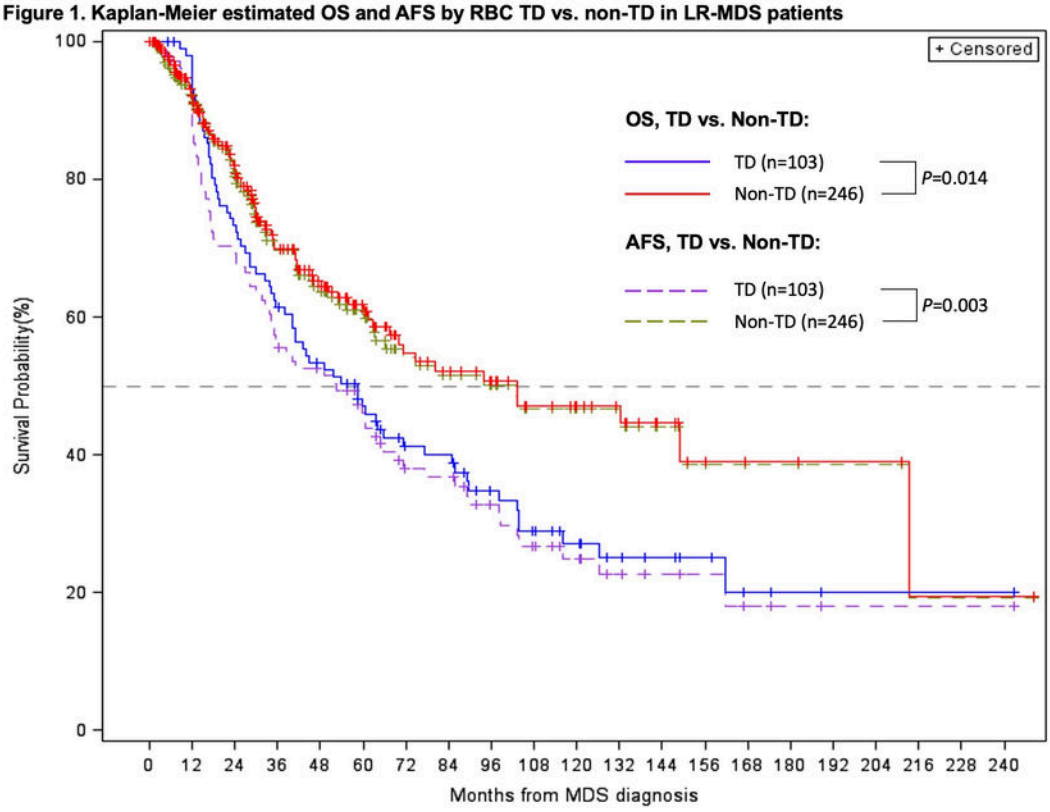
Table 1. HCRU, medical cost, and prognosis by RBC transfusion group

	LR-MDS patients (N=349)			All MDS patients (N=831)		
	TD (N=103)	Non-TD (N=246)		TD (N=194)	Non-TD (N=637)	
HCRU (per 1,000 person-years) *						
No. of outpatient visits	15,676	8,303		14,671	9,879	
No. of hospitalization	709	456		896	700	
No. of emergency room visits	587	328		716	500	
Days of hospital stay	13,343	8,272		18,089	12,127	
Required units of packed RBC	31,107	7,073		27,606	8,616	
Medical cost (USD per 1,000 person-years) ††						
Total medical cost	13,501,635	6,086,585		16,673,597	8,461,821	
Outpatient cost	6,304,150	2,658,964		6,411,754	3,525,449	
Hospitalization cost	10,194,199	8,261,935		13,356,746	11,486,250	
Emergency room cost	335,715	228,910		446,963	300,810	
Prognosis (months)			*P*-value‡			*P*-value‡
Median OS (95% CI)	58.4 (40.0-77.2)	103.1 (67.6-213.4)	0.014	39.2 (31.5-51.1)	41.5 (33.6-60.4)	0.357
Median AFS (95% CI)	52.7 (34.3-70.0)	102.7 (62.9-213.4)	0.003	33.8 (25.3-42.5)	40.9 (32.9-55.7)	0.143

AFS: AML-free survival, AML: acute myeloid leukemia, CI: confidence interval, HCRU: healthcare resource use, LR: lower-risk, MDS: myelodysplastic syndromes, OS: overall survival, RBC: red blood cell, USD: US dollar
*HCRU data were available starting from 1994, while cost data were accessible from 2001.
† 1 USD = 1,205.25 Korean Won (KRW)
‡ Log-rank *P*

Figure 1. Kaplan-Meier estimated OS and AFS by RBC TD vs. non-TD in LR-MDS patients



AFS: AML-free survival, LR: lower-risk, MDS: myelodysplastic syndromes, OS: overall survival, RBC: red blood cell, TD: transfusion dependence

Figure 1

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