

Healthcare Resource Utilization and Costs among Patients with Myelodysplastic Syndrome Who Failed 1st-Line Therapy

Christopher R. Cogle, MD¹; Sudipto Mukherjee, MD, MPH²; Tanya G.K. Bentley, PhD³; Michael S. Broder, MD, MSHS³; Eunice Chang, PhD³; Moira E. Lawrence, PhD⁴; Thomas J. McKearn, MD, PhD⁴; Scott Megaffin⁴; Rita Percy⁴; Michael E. Petrone, MD, MPH⁴; Gordon H. Sun, MD, MS³

¹University of Florida, Gainesville, FL; ²Cleveland Clinic Foundation, Cleveland, OH; ³Partnership for Health Analytic Research, LLC, Beverly Hills, CA; ⁴Onconova Therapeutics, Inc., Newtown, PA

BACKGROUND

- The myelodysplastic syndromes (MDS) primarily affect older adults.
- Although 1st-line therapies are available for treating MDS, the majority of patients will not achieve clinical improvements and nearly all MDS patients eventually progress and die of relapsed/refractory disease.
- The health resource burden of MDS patients who fail 1st-line therapies is unknown.
- 6-month treatment costs for newly-diagnosed MDS patients have been estimated to exceed \$24,000 per-patient in Medicare populations.^{1,2}

OBJECTIVE

- Use commercial claims data to examine resource utilization and costs among patients with MDS who failed 1st-line drug therapy.

METHODS

Study Design and Data Source

- Retrospective cohort study of a large US, HIPAA-compliant, commercial health insurance claims database.
- Timeframe: 1/1/2009 to 12/31/2011.

Study Population

- We identified patients with a MDS-associated medical claim (ICD-9-CM diagnosis codes 238.7x) who were using an HMA and who were considered to have failed initial HMA treatment (azacitidine or decitabine) in the identification (ID) period (1/1/2009–12/31/2011).
- The index date was the date on which patients were defined as eligible for 2nd-line therapy (i.e., initiated HMA treatment but then stopped for ≥ 2 months, switched to another HMA, or have been on the same HMA for > 7 months).
- Patients were followed for ≥ 6 months after they became candidates for 2nd-line treatment.

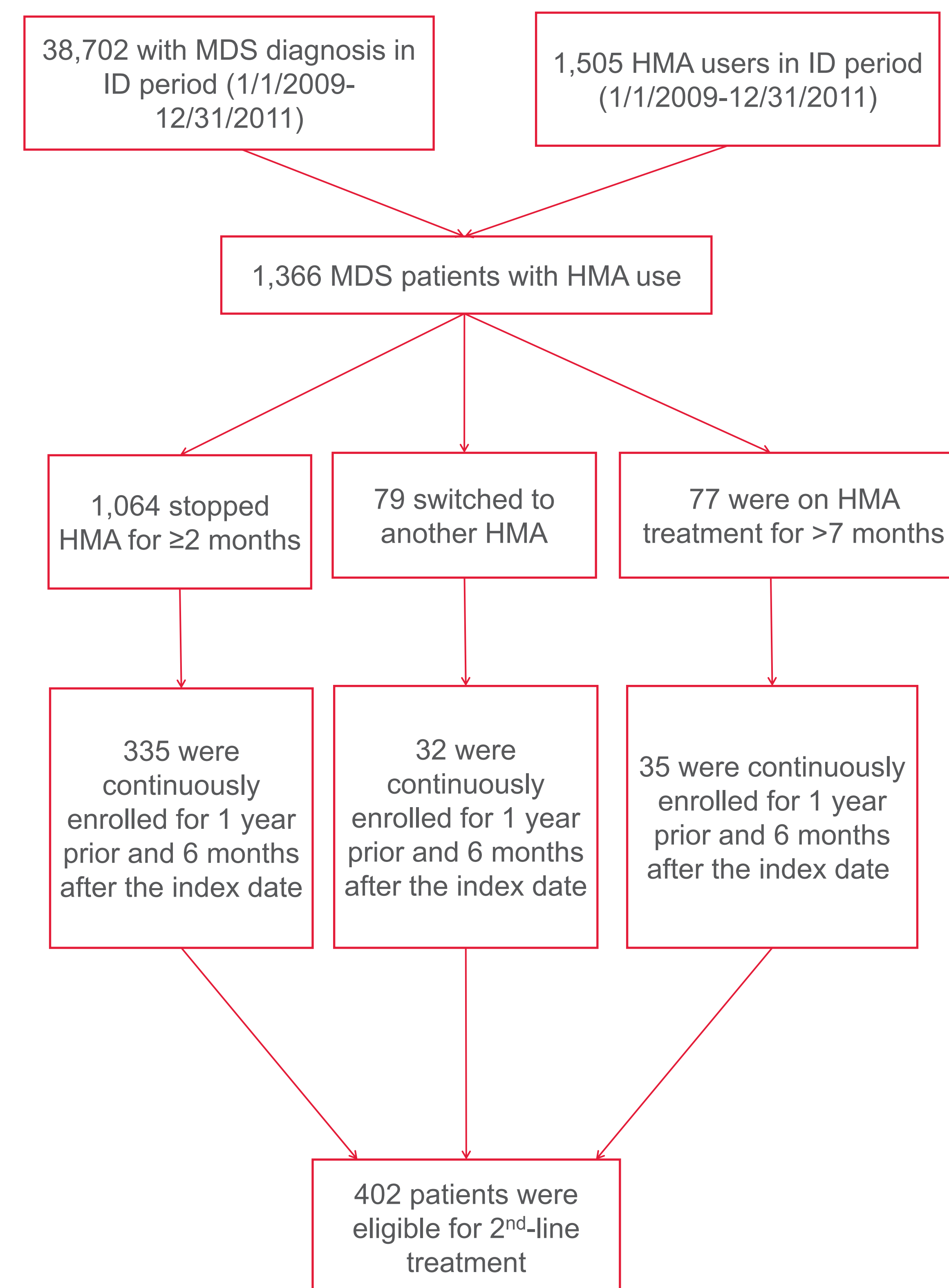
Outcomes

- All-cause and MDS-specific costs and healthcare resource utilization (HRU) 12 months before and 6 months after index date. Outcomes of interest included MDS-related and overall HRU and costs.
- MDS-related costs and HRU included claims with a primary diagnosis of MDS, acute myeloid leukemia, anemia, neutropenia, thrombocytopenia, or pancytopenia.

RESULTS

- We identified 402 MDS patients who failed 1st-line therapy were identified as shown in the figure below.

Figure 1. Patient Selection Flowchart



- Among 402 eligible patients, mean age was 72.9 years and 40% were female (Table 1).
- The mean Charlson Comorbidity Index (CCI) score was 3.6.
- AML/MDS dual diagnosis during observation period occurred in 24.1% of patients.
- Nearly all patients (96%) had a cytopenia and 51.7% were receiving blood transfusions and/or growth factors (42.3%).

Table 1. Baseline Patient and Disease Characteristics

Characteristic	Value
Age, year, mean (SD)	72.9 (9.1)
Female, no. (%)	160 (39.8)
Charlson Comorbidity Index (CCI), mean (SD)	3.6 (2.9)
Number of chronic conditions, mean (SD)	6.8 (2.3)
AML/MDS dual diagnosis, no. (%)	97 (24.1)
Cytopenias, no. (%)	386 (96.0)
Pancytopenia	202 (50.2)
Anemia	373 (92.8)
Thrombocytopenia	212 (52.7)
Leukopenia	93 (23.1)
Neutropenia	213 (53.0)
Blood transfusions, no. (%)	208 (51.7)
Growth factors, no. (%)	170 (42.3)
Region, no. (%)	
Midwest	107 (26.6)
Northeast	40 (10.0)
South	155 (38.6)
West	100 (24.9)

Table 2. HRU and Costs in Baseline and Followup Periods

Outcome	Prior to 1 st Line Failure (12-month period)		After 1 st Line Failure (6-month period)	
	Any Diagnosis	MDS-related Diagnosis	Any Diagnosis	MDS-related Diagnosis
Physician office visits, mean (SD)	58.0 (30.6)	42.7 (29.4)	25.9 (21.1)	18.9 (19.2)
Emergency Department visits, no. (%)				
0	265 (65.9)	371 (92.3)	323 (80.3)	375 (93.3)
1+	137 (34.1)	31 (7.7)	79 (19.7)	27 (6.7)
Hospitalizations, no. (%)				
0	200 (49.8)	283 (70.4)	271 (67.4)	334 (83.1)
1+	202 (50.2)	119 (29.6)	131 (32.6)	68 (16.9)
LOS ^a (days), mean (SD)	14.8 (17.9)	8.7 (9.9)	16.4 (21.2)	12.9 (16.5)
Total healthcare costs, mean (SD)	\$127,162 (101,980.5)	\$80,673 (60,779.3)	\$76,945 (92,763.9)	\$45,564 (60,118.8)
Total non-pharmacy costs, mean (SD)	\$119,128 (99,622.5)	\$32,083 (42,464.2)	\$70,678 (90,100.5)	\$24,474 (54,093.1)
Total pharmacy costs, mean (SD)	\$8,034 (18,399.7)	\$48,590 (40,590.8)	\$6,267 (13,337.1)	\$21,090 (26,387.4)

^a Length of stay (LOS) among patients with hospitalization.

HRU and Costs Prior to 1st Line Treatment Failure

All-cause

- Mean all-cause annual cost was \$127,162 per patient (Table 2).
 - Non-pharmacy spending accounted for 93.4% of costs.
- Patients averaged 58 all-cause office visits annually.
- 50.2% had ≥1 all-cause hospitalization; mean LOS was 14.8 days.
- 15.9% had ≥1 all-cause ED visit.

MDS-related

- MDS annual costs accounted for 63% of all-cause costs and mean costs were \$80,673 per patient (Table 2).
 - Over 60% of MDS costs were spent on pharmacy services.
- Patients averaged 42.7 MDS office visits annually (Table 2).
- 29.6% had ≥1 MDS hospitalization; mean LOS 8.7 days
- 7.7% had ≥1 MDS ED visit

HRU and Costs After 1st Line Treatment Failure

- Mean all-cause 6-month cost was \$76,945 per patient (Table 2).
 - 59% of spending was MDS-related
 - Mean MDS-related cost was \$45,564 per patient.
- MDS-related HRU was high in the 6-month period:
 - Mean 18.9 office visits;
 - Patients with ≥ 1 MDS-specific ED visit comprised 6.7% of the cohort;
 - 16.9% of patients had ≥ 1 MDS-specific hospitalization; 1.0% was hospitalized due to hemorrhage, and 6.0% due to infection.

- Mean LOS for MDS-specific hospitalizations was 12.9 days.
- MDS-specific treatment accounted for 46.3% of MDS-related costs.

CONCLUSION

- The healthcare and economic burden of MDS patients who failed 1st-line therapy is substantial.
- The costs of care for commercially insured MDS patients in this study were approximately 3 times higher, \$76,945, than previously published costs in Medicare patients, \$24,249.¹
- Early discontinuation or failure of HMA therapy accentuates a poorer prognosis for patients post-HMA, with a predicted median survival of 4-6 months³
- Effective 2nd-line therapies that enhance survival and reduce cytopenias are needed to mitigate patient and economic burden of MDS.

REFERENCES

- Craig BM, et al. Diagnostic testing, treatment, cost of care, and survival among registered and non-registered patients with myelodysplastic syndromes. *Leuk Res.* 2011 Nov;35(11):1453-6
- Goldberg SL, et al. Incidence and clinical complications of myelodysplastic syndromes among United States Medicare beneficiaries. *J Clin Oncol.* 2010 Jun 10;28(17):2847-52.
- Jabbour E, et al., Outcome of Patients with MDS After Failure of Decitabine Therapy; *Cancer* 2010