

# OCCURRENCE OF HEMATOLOGIC CONDITIONS IN MYELODYSPLASTIC SYNDROME PATIENTS RECEIVING HYPOMETHYLATING AGENTS OR SUPPORTIVE CARE

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## Background

- Myelodysplastic Syndrome (MDS) is a heterogeneous group of disorders characterized by impaired bone marrow production (cytopenias).<sup>1</sup>
- Signs and symptoms of anemia, bleeding, and/or infections predominate and features of autoimmunity are present.<sup>1</sup>
- MDS has an incidence of about 5/100,000 people in the general population, while incidence in people age > 70 years ranges from 20-40/100,000.<sup>2</sup>
- Median survival for de novo MDS is 5 months to 6 years depending on the risk category.<sup>3</sup>
- Two hypomethylating agents (HMAs), decitabine (DEC) and azacitidine (AZA), and the thalidomide analogue (TA) lenalidomide, are FDA-approved for use in treatment of MDS.<sup>4-7</sup>
- However, supportive care remains a leading therapy option for treatment of MDS patients.<sup>3,7</sup>

## Objectives

To describe the prevalence of hematologic conditions in patients with MDS treated with HMAs—decitabine and azacitidine—and in MDS patients receiving supportive care.

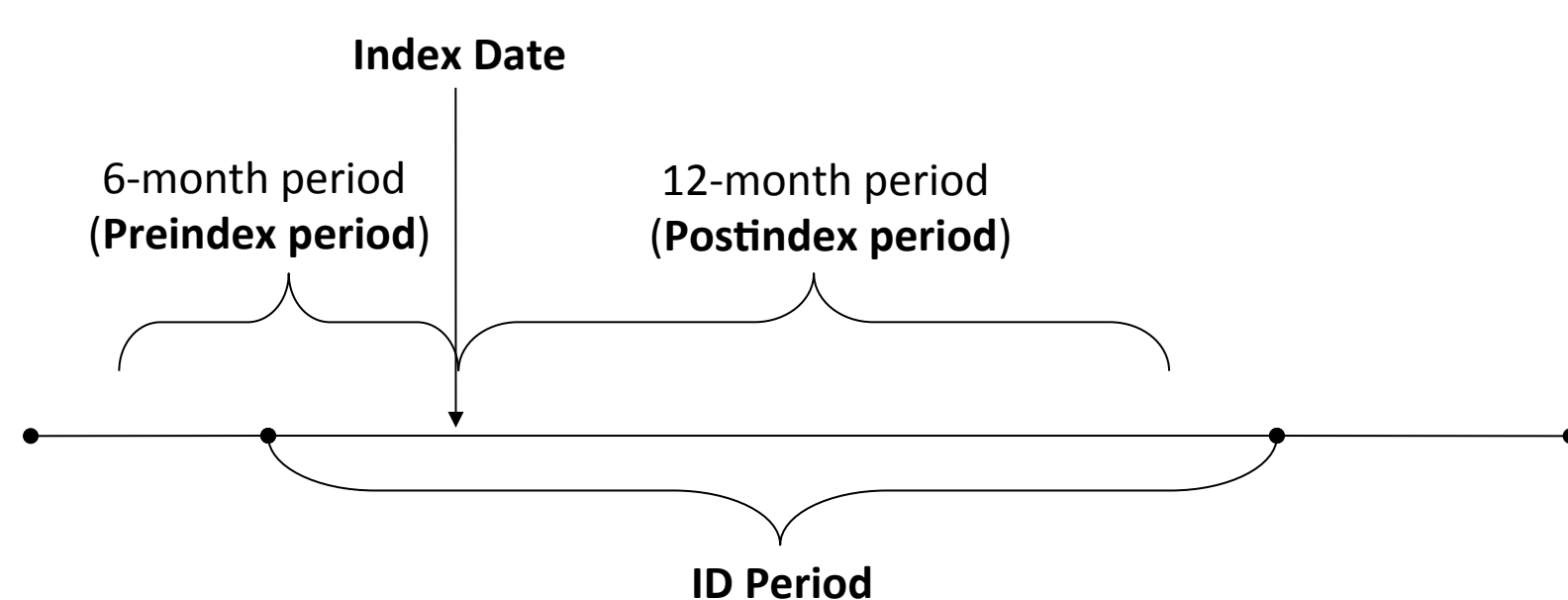
## Methods

### Study Design and Data Source

- This was a retrospective cohort study.
- We used data from 2 HIPAA-compliant administrative claims databases: Thomson Reuters MarketScan and i3/Ingenix LabRx.

### Study Population and Study Timeframe

- Patients diagnosed with MDS that were either newly-treated with DEC or AZA or received supportive care only in identification (ID) periods:
  - 2/1/2007-7/31/2008 (i3) and 7/1/2005-12/31/2008 (MarketScan) for treated patients, and
  - 2/1/2007-7/31/2008 (i3) for supportive care patients.
- Patients were followed for 12 months postindex, such that:
  - For treated patients, index was the date of initial active HMA treatment in the ID period, and
  - For supportive care patients, index was the date of first MDS diagnosis in the ID period.



### Inclusion criteria:

- Treated patients were included if they had a medical claim with a diagnosis of MDS (ICD-9-CM codes 238.72-238.75) in any diagnosis field *and* a claim of DEC/AZA in the ID period.
- Supportive care patients were included with first diagnosis of MDS (same ICD-9-CM) in any diagnosis field in the ID period.

### Exclusion criteria:

- Patients were excluded if they had a preindex diagnosis of acute myeloid leukemia or were not continuously enrolled in the preindex and postindex periods.
- Treated patients were also excluded if they had a preindex claim of DEC/AZA or a first treatment regimen that was not DEC/AZA.
- Supportive care patients were also excluded if they had preindex MDS diagnosis or a claim for DEC/AZA in the postindex.

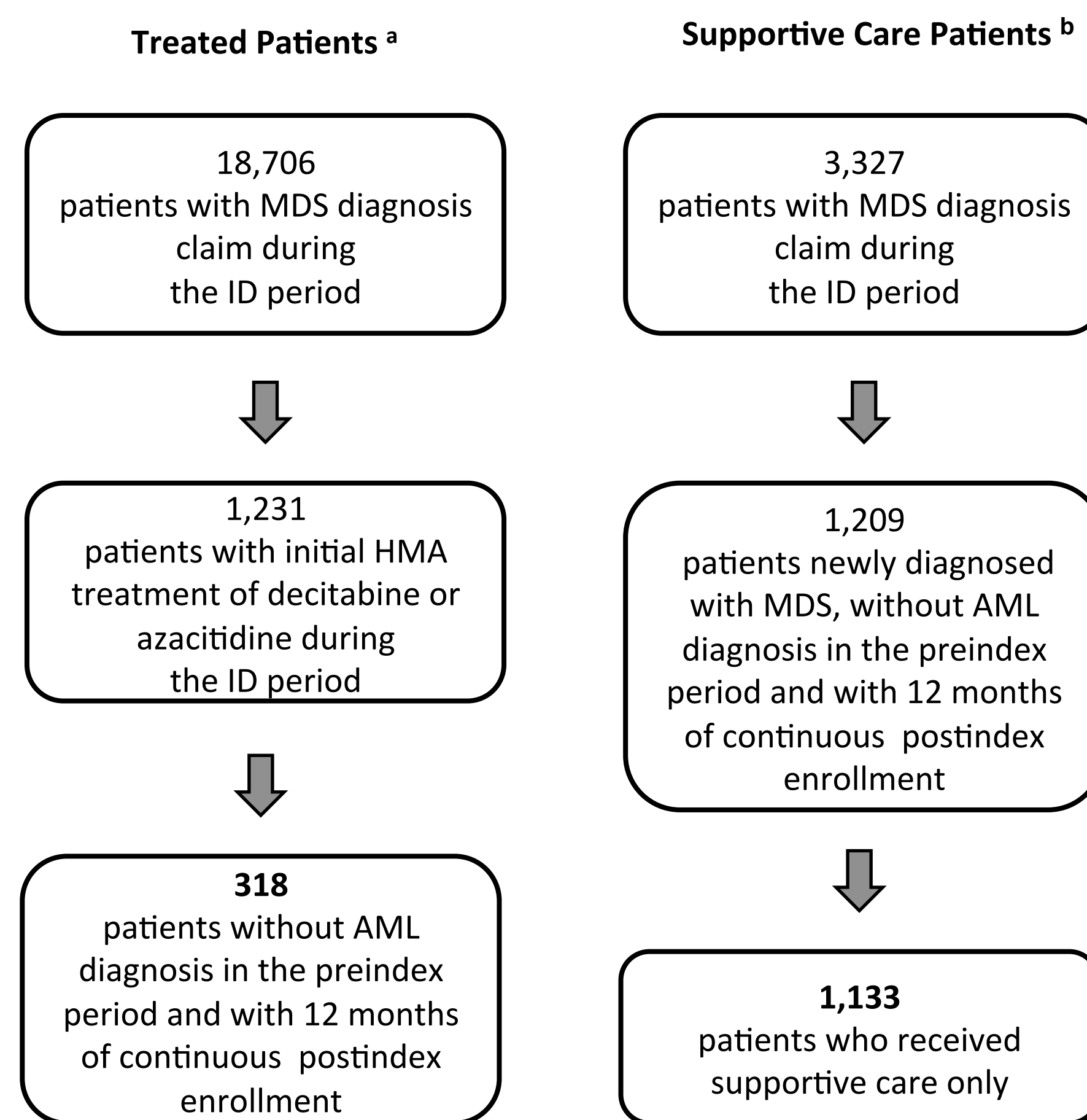
### Measures

- Baseline demographic variables (age, sex, region) were defined using preindex claims.
- Outcome measures were hematologic conditions, constructed using published claims-based definitions:<sup>1</sup>
  - Anemia: anemia diagnosis, utilization of erythropoietin, or utilization of iron chelation therapy (deferoxamine or deferasirox)
  - Transfusions
  - Neutropenia: diagnosis of neutropenia, febrile neutropenia, or decreased white blood cell count; or utilization of granulocyte-colony stimulating factors (G-CSFs)
  - Potential complication of neutropenia: pneumonia, unspecified fever, or outpatient pharmacy IV antibiotics (ATB) use
  - Thrombocytopenia: diagnosis of thrombocytopenia
  - Pancytopenia

### Statistical Analysis

- Descriptive statistics for all measures were stratified by 2 cohorts:
  - MDS Patients newly treated with HMAs, and
  - Patients newly diagnosed with MDS and receiving supportive care only.
- All categorical variables were compared using the  $\chi^2$  test. Mean age was compared using t-test (2 group comparison).
- All statistical analyses were performed using SAS® version 9.2 (SAS Institute, Cary, NC).

## Cohort Identification



<sup>a</sup> Newly treated MDS patients  
<sup>b</sup> Newly diagnosed MDS patients

## Demographics of Newly Treated and Newly Diagnosed Supportive Care MDS Patients

		Treated Patients N = 318	Supportive Care Patients N = 1,133	P Value <sup>a</sup>	
Age, years	Mean (SD)	70.7 (10.8)	62.9 (15.8)	<.001	
	≤49	no. (%)	11 (3.5)	221 (19.5)	<.001
	50-64	no. (%)	81 (25.5)	376 (33.2)	
	65-74	no. (%)	86 (27.0)	210 (18.5)	
	75-84	no. (%)	118 (37.1)	255 (22.5)	
	85+	no. (%)	22 (6.9)	71 (6.3)	
Female	no. (%)	111 (34.9)	616 (54.4)		

<sup>a</sup> Comparisons between newly treated MDS patients and newly diagnosed MDS patients receiving supportive care were done using the  $\chi^2$  test (age groups) and the t-test (mean age).

- Newly HMA-treated patients were statistically significantly older (70.7 vs. 62.9 years) than newly diagnosed MDS patients that received supportive care only ( $P<0.001$ ).
- Similarly, the two patients cohorts differed significantly in distribution across age groups, indicating that up to 71.2% of newly diagnosed supportive care patients are younger than 75 years old as compared to 56% of newly treated patients.
- Newly treated patients had a significantly greater proportion of males (65.1% vs. 45.6%) as compared to newly diagnosed supportive care patients ( $P<0.001$ ).

## Conclusions

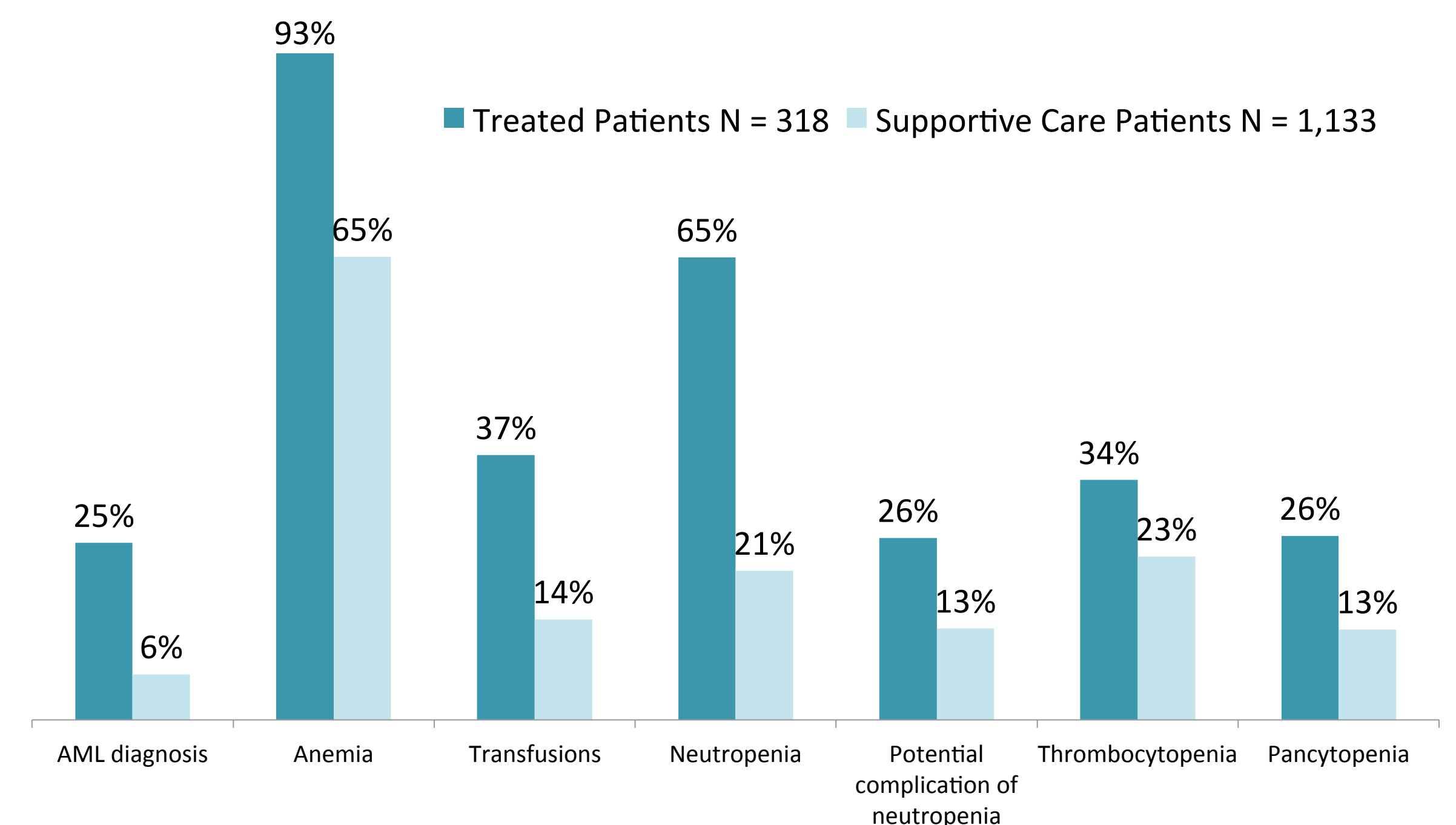
- Our retrospective study suggested that anemia and neutropenia are some of the most common conditions in MDS patients, particularly among those treated with HMAs.
- The majority of MDS patients received supportive care, rather than HMA treatment.
- MDS patients who were older, male, and had more hematologic conditions were more likely to initiate treatment with HMAs. This is likely reflected in the natural history of treatment for this condition, in which newly treated patients may have had a longer MDS history compared to the newly diagnosed supportive care patients.
- Overall, hematologic conditions were statistically significantly more common in treated patients.

## Limitations

- This was a retrospective study using health care claims. Claims are collected and processed for payment rather than research purposes and, as a result, may be subject to undercoding or miscoding.
- Additionally, claims lack data on clinical factors, such as disease severity.
- Our study included patients with commercial insurance, so Medicare patients were underrepresented.
- Our results may not be representative of the general MDS population, and different populations may have different outcomes.

## Results

### Hematologic Conditions in the Postindex Period Among Newly Treated and Newly Diagnosed Supportive Care MDS Patients



### Hematologic Conditions in the Postindex Period

	Treated Patients N = 318	Supportive Care Patients N = 1,133	P Value <sup>a</sup>
AML diagnosis	No. (%)	No. (%)	<.001
Anemia	297 (93.4)	735 (64.9)	<.001
Anemia diagnosis	275 (86.5)	724 (63.9)	<.001
Erythropoietin use	223 (70.1)	288 (25.4)	<.001
Iron chelation therapy	38 (11.9)	10 (0.9)	<.001
Transfusions	118 (37.1)	160 (14.1)	<.001
Neutropenia	206 (64.8)	237 (20.9)	<.001
Neutropenia diagnosis <sup>b</sup>	114 (35.8)	209 (18.4)	<.001
G-CSF use	174 (54.7)	78 (6.9)	<.001
Potential complication of neutropenia	81 (25.5)	145 (12.8)	<.001
Pneumonia	65 (20.4)	125 (11.0)	<.001
Unspecified fever	27 (8.5)	37 (3.3)	<.001
Outpatient Rx IV ATB use	3 (0.9)	4 (0.4)	0.179
Thrombocytopenia	107 (33.6)	259 (22.9)	<.001
Pancytopenia	82 (25.8)	144 (12.7)	<.001

<sup>a</sup> Comparisons between newly treated MDS patients and newly diagnosed MDS patients receiving supportive care were done using the  $\chi^2$  test.  
<sup>b</sup> Diagnosis of neutropenia, febrile neutropenia, or decreased white blood cell count.

- Twenty-five percent of newly treated patients developed AML compared to 6.4% of newly diagnosed supportive care patients, and this difference in proportions was statically significant ( $P<0.001$ ).
- Newly treated patients had significantly more hematologic conditions compared to newly diagnosed MDS patients who received supportive care only ( $P<0.001$ ):
  - 93.4% vs. 64.9% had anemia;
  - 37.1% vs. 14.1% had transfusions;
  - 64.8% vs. 20.9% had neutropenia;
  - 25.5% vs. 12.8% had potential complications of neutropenia;
  - 33.6% vs. 22.9% had thrombocytopenia; and
  - 25.8% vs. 12.7% had pancytopenia.
- Newly treated patients also used significantly more erythropoietin (70.1% vs. 25.4%) and granulocyte-colony stimulating factor (54.7% vs. 6.9%;  $P<0.001$ , for both comparisons).

## Conclusions

### References

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