

## Oral Session

*Myelodysplastic Syndromes: Iron Overload, Immune Mechanisms and Risk Categorization*

# Clinical and Economic Consequences of Myelodysplastic Syndromes in the United States: An Analysis of the Medicare Database

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## Abstract

**Background:** The myelodysplastic syndromes (MDS) are a heterogeneous group of marrow failure syndromes causing anemia requiring red blood cell transfusions. Since iron overload from chronic transfusions may result in organ damage, it is possible that MDS patients (pts) may develop co-morbid conditions. The aim of this analysis is to describe clinical and economic consequences in newly diagnosed MDS pts followed over a three year period compared to those without MDS in the Medicare population.

**Methods:** The Medicare Standard Analytic File 5% (SAF5%) claims database was used to identify pts with a new primary MDS diagnosis code from Jan-Mar 2003, and followed till Dec 2005 or death. Pts with myeloid leukemia or anemias of known causes in the previous year were excluded. The study timeframe predates the widespread use of "low intensity" treatments to reflect the natural history of MDS with transfusional and growth factor support.

**Results:** Of the 1,713,502 pts in SAF5%, 705 (41 per 100,000) developed MDS in Jan – Mar 2003. Of these 705 cases, 159 had a previous history of unexplained anemia (23%), 43 received prior chemotherapy or radiotherapy (6%), and 503 were de novo (71%). MDS pts were older than the overall SAF5% population (72% vs. 57% were  $\geq 70$  years;  $p < 0.0001$ ); male (49% vs. 42%;  $p = 0.0003$ ), and Caucasian (90% vs. 86%;  $p = 0.0164$ ). The diagnosis of MDS was confirmed by bone marrow evaluation in 400 (57%) whereas the MDS diagnostic code was applied by the treating physician based on clinical impression in 43%. During the 3-year follow-up study period, 522 (74%) suffered a cardiac-related event: 142 MIs (20%); 344 CHF (49%); 374 arrhythmias (53%); and 415 less common events (58%). 383 (54%) had no cardiac history in 2002, and among this cohort, 228 (60%) developed cardiac disease. For comparison, of the approximately 1.7 million individuals in Medicare SAF5% database, 726,936 (42.4%) suffered cardiac disease during the 3-year study, significantly less than the MDS cohort (74%;  $p < 0.001$ ). Of the 327 (46%) receiving blood transfusions, 7(2%) were iron chelated. Transfused MDS pts experienced a higher rate of cardiac events; 260 (80%) transfused MDS pts

experienced a cardiac event compared with 262 MDS pts (69%) that did not receive transfusions ( $p=0.002$ ). Diabetes was recorded in 306 (43%) of the 705 MDS pts. Of the 505 pts without a diabetic history, 117 (23%) developed diabetes during the 3 year study. Dyspnea as a diagnostic code was recorded in 359 (51%). Of the 576 pts without a pulmonary history, 261 (45%) developed dyspnea. Hepatic diseases occurred in 13 (1.8%) MDS pts, and were new in 12 (1.7%). Infectious complications occurred in 45%. Deaths occurred in 278 (39%); 63% in the therapy-induced, 40% prior anemia, and 37% de novo groups. During the 3 year study 79% of the MDS pts were hospitalized, 59% had 1 emergency room visit, 45% received growth factor treatments, and 15% chemotherapy. In 2003, median Medicare payment for the MDS pt cohort was \$17,556, compared to \$1,459 for the total SAF5% Medicare population (mean: \$28,023 vs. \$6,739;  $p<0.001$ ). For the MDS cohort ( $N=705$ ), median Medicare payments were \$34,271 for therapy induced; \$17,191 for prior unexplained anemia history, and \$16,493 for de novo MDS. In 2004, median Medicare payment for the MDS pt cohort ( $N=550$ ) was \$11,775, compared to \$1,633 for the total SAF 5% Medicare population (mean: \$22,419 vs. \$7,310;  $p<0.001$ ). In 2005, median Medicare payment for the MDS pt cohort ( $N=431$ ) was \$9,840, compared to \$1,802 for the total SAF 5% Medicare population (mean: \$21,533 vs. \$7,829;  $p<0.001$ ).

**Conclusions:** MDS represents a significant US health concern among Medicare pts, with substantial economic implications. Organ impairment following a diagnosis of MDS is common with transfusion dependent MDS pts. Since chronic anemia can lead to cardiac dysfunction and transfusional iron overload is also known to contribute to cardiac dysfunction, strategies to improve anemia and maintain adequate iron balance through the administration of iron chelation therapy are critical in MDS pts receiving blood transfusions.

## **Footnotes**

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**Disclosures:** No relevant conflicts of interest to declare.