Hospitalization and Emergency Room Visits Among Patients With Higher-Risk Myelodysplastic Syndromes by Hypomethylating Agent Use

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Background

• Hypomethylating agents (HMAs) are the mainstay of treatment for patients with higher-risk myelodysplastic syndromes (MDS).
• In the United States, the HMA prescribing guidelines recommend the treatment of adult patients with HMA therapy.1
• While studies show clear therapeutic benefits, previous analyses have shown undertreatment of individuals with or without HMA use in clinical practice.2–4

Objectives

• To better understand the impact of HMA use on healthcare resource utilization, this study compared the rate of hospitalization and emergency room visits among higher-risk MDS patients according to use or non-use of HMA therapy.

Methods

• Study design and data source
  • An observational, retrospective cohort study using data from the 2010–2016 SEER-Medicare linked database.
  • Eligible patients were those with a diagnosis of MDS between January 1, 2010 and December 31, 2016. The study period was January 1, 2010 to December 31, 2016.

• Eligibility criteria
  • Patients with a new diagnosis of MDS and/or International Classification of Diseases for Oncology (Third Edition) codes (C91.1–C91.9) for Medicare beneficiaries with cancer treated elsewhere (CMS-150 form, for oncology cases for cancer treatment) who were continuously enrolled in Medicare Part A (inpatient/hospital coverage) and Part B (outpatient/medical coverage) from the time of diagnosis to 1 year after diagnosis.

• Data analysis
  • Multivariable zero-inflated negative binomial regression models were used to assess the relationship between HMA therapy on healthcare resource utilization among higher-risk MDS patients.

Results

• Of the 1,190 higher-risk MDS patients included, 613 (51.2%) were HMA users. Among HMA users, HMA use was associated with a greater number of hospitalizations and ER visits per month, a greater number of hospitalizations and ER visits overall, and poor performance status.

• The rate of HMA use among our higher-risk MDS population was significantly higher than previously reported in clinical trials.

Conclusions

• This study found substantial undertreatment of HMA therapy, which was associated with considerable economic impact, as indicated by reduced rates of hospitalizations and ER visits among higher-risk MDS patients.

Patient population

• Overall, 1,190 patients (mean age 71.6 years) with a diagnosis of MDS during the study period, and 1,180 patients were included in the study cohort. 350 HMA users were HMA users and 840 (68.4%) were non-HMA users.

Table 1. Baseline Demographic and Clinical Characteristics of Higher-Risk MDS Patients, by HMA Use

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>HMA users (n=664)</th>
<th>Non-HMA users (n=840)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>72.5 ± 5.6</td>
<td>71.5 ± 5.7</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Gender (male, %)</td>
<td>47.1%</td>
<td>45.1%</td>
<td>0.56</td>
</tr>
<tr>
<td>Race (White, %)</td>
<td>57.2%</td>
<td>51.5%</td>
<td>0.09</td>
</tr>
<tr>
<td>Diagnosis date (median, years)</td>
<td>2009</td>
<td>2009</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Site of diagnosis (median, years)</td>
<td>2009</td>
<td>2009</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Age at diagnosis (median, years)</td>
<td>72.5</td>
<td>71.5</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Charlson comorbidity score (median)</td>
<td>3.0</td>
<td>3.0</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>ECOG performance score (median)</td>
<td>1.0</td>
<td>1.0</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

Figure 1. Study Design

Figure 2. Cohort Selection for Higher-Risk MDS Patients

Figure 3. Mean Number of Hospitalizations and ER Visits per Month

Table 2. Results From Zero-Inflated Regression Model for the Number of Hospitalizations or ER Visits Among Higher-Risk MDS Patients

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<tr>
<td>Incidence of hospitalization (IRR, 95% CI)</td>
<td>1.07 (1.04–1.11)</td>
<td>1.00 (0.97–1.04)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Incidence of ER visit (IRR, 95% CI)</td>
<td>1.17 (1.06–1.28)</td>
<td>1.00 (0.95–1.05)</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

References


Appendix

Acknowledgments

Categories

• All higher-risk MDS patients (n=1,190)
  • HMA users (n=664)
  • Non-HMA users (n=840)
  • Patients with a diagnosis of RAEB between January 1, 2011 and December 31, 2016
  • Patients with a diagnosis of RAEB with excess blasts before higher-risk MDS diagnosis
  • Patients with a diagnosis of RAEB with excess blasts after death date
  • Patients with a diagnosis of RAEB not continuously enrolled in Medicare
  • Patients with a diagnosis of RAEB not continuously enrolled in Medicare during the 1-year follow-up period

Appendix: Hospitalizations and ER visits among HMA users and non-users

- All higher-risk MDS patients (n=1,190): 2,252 hospitalizations and 440 ER visits (2010-2016). 
- HMA users (n=664): 658 hospitalizations and 160 ER visits (2010-2016). 
- Non-HMA users (n=840): 1,594 hospitalizations and 280 ER visits (2010-2016).

- The rates of hospitalization per month and ER visits were significantly higher for patients from a urban location (IRR: 1.10, 95% CI: 1.05–1.16; p < 0.001).
- The rate of hospitalization per month and ER visits were significantly higher for patients from a Medicare component (IRR: 1.10, 95% CI: 1.05–1.16; p < 0.001).
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