Evaluating the Impact of Anemia and Blood Transfusions on Patient Treatment Selection and Survival Rates for Patients With Myelofibrosis (MF) Using Real-World Data

RWD79

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Background and Objectives

Myelofibrosis (MF) is a rare type of hematologic malignancy that affects healthy blood cell production and causes progressive fibrosis in the bone marrow.[1] MF can arise de novo (primary MF) or after polycystic vera or essential thrombocythemia (secondary MF).[1] One of the cardinal features of MF is anemia, with many patients requiring blood transfusions.[2]

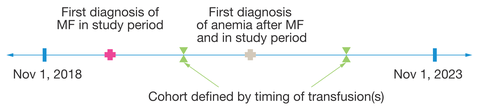
It is thought that at least 38% of patients have hemoglobin levels <10 g/dL upon the initial MF diagnosis, and the proportion of patients with MF with anemia grows as the disease continues to progress.[3] Anemia has been shown to be a negative prognostic indicator[2,4,5] and results in a decreased quality of life.[2,3,6] There are many etiologies of anemia in patients with MF, and the use of Janus Kinase (JAK) inhibitors furthers the prevalence.[7]

This study explores the patient population with secondary MF, observing those who develop anemia or have concurrent anemia, those who undergo blood transfusions, and the impact on treatment selection.

Methods

- Real-world data were utilized to analyze the patient population diagnosed with secondary MF and anemia to explore the population characteristics leveraging ICON's Symphony Health Integrated Dataverse (IDV®).
- Data used in the current analysis are from IDV®, an open, multisource dataset that is representative of all 50 US states and territories. These claims data are captured through thousands of sources, including pharmacy direct feeds and lifecycle (Network Intelligence Bureaus) feeds. IDV® encompasses medical, hospital, and prescription claims across all payment types (commercial, Medicare, Medicaid, Managed Medicaid, cash, and assistance programs). The dataset represents 17+ years of historical data for more than 307 million active de-identified patients, 1.9 million healthcare providers, and 18,000+ unique plans.
- **Study Period:** November 1, 2018 through November 1, 2023
- **Patient selection criteria:**
  - ≥1 diagnosis code for secondary MF during the study period captured from medical claims
    - **Index Date:** date of first MF diagnosis in the study period
  - ≥1 diagnosis code for anemia after the index date and during the study period captured from medical claims
- Non-mutually exclusive cohorts were identified based on evidence and timing of transfusion(s):
  - **Cohort 1:** Patients with ≥1 transfusion any time following MF diagnosis and during the study period
  - **Cohort 2:** Patients with ≥1 transfusion any time following anemia diagnosis and during the study period
  - **Cohort 3:** Patients with no observed transfusion following MF diagnosis
  - **Cohort 4:** Patients with no observed transfusion following anemia diagnosis (patients could have a transfusion between MF and anemia diagnoses)

Figure 1. Study Design and Cohort Definition



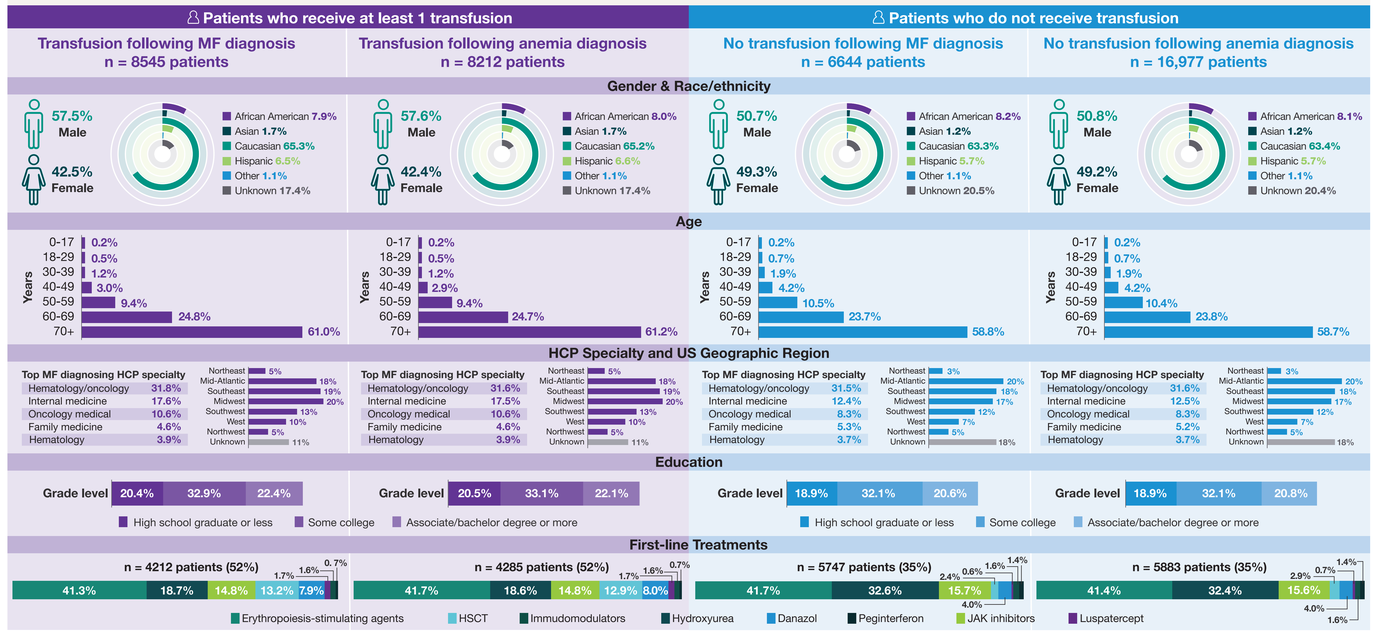
- History of MF and anemia was assessed as far back as November 1, 2013
- Review of first treatment after index date consisted of 2 treatment groups: MF-associated treatment and MF-associated anemia treatment
- Analysis consisted of descriptive statistics counts with percentages for categorical variables and means with standard deviations for continuous variables

Results

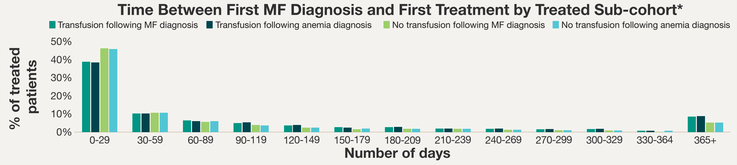
- Of 37,006 patients with diagnoses of MF in the study period, 25,189 patients (68.1%) had subsequent diagnoses of anemia
  Subgroups: MF-associated anemia for 813 patients (3.2%); Other anemia for 11,878 patients (47.2%); Unspecified anemia for 12,498 patients (49.6%)
- 18,446 (73.2%) of patients were newly diagnosed with MF

MF and Anemia Diagnosed Population, N = 25,189

Patients with at least 1 secondary MF diagnosis code claim during the study period AND patients with at least 1 anemia diagnosis code claim following first qualifying MF diagnosis code claim



Time Between First MF Diagnosis and First Treatment by Treated Sub-cohort*



Summary of Time Between First MF Diagnosis and First Treatment

Number of days	Transfusion following MF diagnosis	Transfusion following anemia diagnosis	No transfusion following MF diagnosis	No transfusion following anemia diagnosis
Minimum	0	0	0	0
Maximum	1729	1729	1797	1797
Median	708	684	845	864
Average	102.4	103.9	62.6	62.7

*Thirty-two patients had 2 treatments on the same day and will be counted for each product.

Patients who do not receive a transfusion are starting on treatment more quickly than patients who receive transfusions.

Diagnosis Codes
Secondary myelofibrosis: International Classification of Diseases, 9th Revision (ICD-9-PCS) Codes 289.83 and International Classification of Diseases, 10th Revision (ICD-10-PCS) Codes D75.81
MF-associated anemia: ICD-9-PCS Codes 285.22 and 285.0 and ICD-10-PCS Codes D63.0 and D64.1
Unspecified anemia: ICD-9-PCS Codes 285.9 and ICD-10-PCS Codes D64.9
All other anemia: ICD-9-PCS Codes: 280, 280.0, 280.1, 280.8, 280.9, 281, 281.0, 281.1, 281.2, 281.3, 281.4, 281.8, 281.9, 282, 282.2, 282.3, 282.8, 282.9, 283, 283.0, 283.1, 283.10, 283.19, 283.9, 284, 284.0, 284.09, 284.8, 284.89, 284.9, 285, 285.1, 285.2, 285.21, 285.29, 285.3, 285.8, 648.2, 648.20, 648.21, 648.22, 648.23, 648.24. ICD-10-PCS Codes: D46.0, D46.1, D46.20, D46.21, D46.22, D46.4, D50.0, D50.8, D50.9, D51.0, D51.1, D51.3, D51.8, D51.9, D52.0, D52.1, D52.8, D52.9, D53.0, D53.1, D53.2, D53.8, D53.9, D55.0, D55.1, D55.2, D55.21, D55.29, D55.3, D55.8, D55.9, D58.8, D58.9, D59.0, D59.1, D59.10, D59.11, D59.12, D59.13, D59.19, D59.2, D59.4, D59.8, D59.9, D61.09, D61.1, D61.2, D61.3, D61.89, D61.9, D62, D63.1, D63.8, D64.0, D64.2, D64.3, D64.4, D64.81, D64.89, D75.A, O90.81, O99.011, O99.012, O99.013, O99.019, O99.02, O99.03
MF treatment: Inrebic® (fedratinib dihydrochloride), Droxia® (hydroxyurea), Hydrea® (hydroxyurea), Hydoxyurea® (hydroxyurea), Mylocel® (hydroxyurea), Ojjaara® (momelotinib), Vonjo® (pacritinib), Pegasys® (peginterferon alfa-2A), Pegasys ProClick™ (peginterferon alfa-2A), Jakafi® (ruxolitinib)
Both prescription and medical claims were reviewed for MF-associated anemia treatment: Danocrine® (danazol), Danazol® (danazol), Aranesp® (darbepoetin alfa), Epogen® (epoetin alfa), Retacrit® (epoetin alfa-epbx), Revlimid® (lenalidomide), Lenalidomide® (lenalidomide), Reblozyl® (luspatercept-aamt), Mircera® (methoxy polyethylene glycol-epoetin beta), Pomalyst® (pomalidomide), Thalomid® (thalidomide)

Hematopoietic stem cell transplantation (HSCT) – Allogeneic coding:
- AMA's Current Procedural Terminology (CPT®) codes 38205, 38240
- ICD-9-PCS Codes: 4105 and 4108
- ICD-10-PCS Codes: 30230G1, 30230G2, 30230G3, 30230G4, 30230U2, 30230U3, 30230U4, 30230X1, 30230X2, 30230X3, 30230X4, 30230Y1, 30230Y2, 30230Y3, 30230Y4, 30233G1, 30233G2, 30233G3, 30233G4, 30233U2, 30233U3, 30233U4, 30233X1, 30233X2, 30233X3, 30233X4, 30233Y1, 30233Y2, 30233Y3, 30233Y4, 30240G1, 30240G2, 30240G3, 30240G4, 30240U2, 30240U3, 30240U4, 30240X1, 30240X2, 30240X3, 30240X4, 30240Y1, 30240Y2, 30240Y3, 30240Y4, 30243G1, 30243G2, 30243G3, 30243G4, 30243U2, 30243U3, 30243U4, 30243X1, 30243X2, 30243X3, 30243X4, 30243Y1, 30243Y2, 30243Y3, 30243Y4, 30250G1, 30250X1, 30250Y1, 30253G1, 30253X1, 30253Y1, 30260G1, 30260X1, 30260Y1, 30263G1, 30263X1, 30263Y1

Transfusion coding:
- AMA's Current Procedural Terminology (CPT®) code 36430
- ICD-10-PCS Codes: 30230N0, 30230N1, 30230P0, 30230P1, 30233N0, 30233N1, 30233P0, 30233P1, 30240N0, 30240N1, 30240P0, 30240P1, 30243N0, 30243N1, 30243P0, 30243P1, 30250N0, 30250N1, 30250P0, 30250P1, 30253N0, 30253N1, 30253P0, 30253P1, 30260N0, 30260N1, 30260P0, 30260P1, 30263N0, 30263N1, 30263P0, 30263P1

Conclusions

These real-world data illustrate that the impact of anemia and transfusions on patient treatments and time for treatment requires further exploration of treatment selection. Focusing on newly diagnosed patients and mutually exclusive patient groups may assist this exploration in the future.

Additionally, further exploration of the frequency of transfusion between or during treatment may prove interesting when looking at the correlation between survival and number of transfusions and type of treatment. A confirmatory diagnosis or lab result validating the MF diagnosis would further enhance these results.

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