

Factors Associated with Bone Mineral Density in Myelofibrosis Patients

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BACKGROUND

- Hematopoietic cell transplant (HCT) recipients have a significant risk of developing osteoporosis and bone fractures.
- While dual-energy X-ray absorptiometry (DEXA) scan is the standard measure of bone density, certain bone conditions such as **osteosclerosis make DEXA difficult to interpret.**
- **Myelofibrosis** is characterized by **bone marrow scarring** (reticulin fibrosis) which can contribute to **osteosclerosis** (scarred bone).
- Our aim was to determine the incidence of osteopenia and osteoporosis in MF patients as measured by DEXA and assess associations between disease related variables.

Disease Progression

Myelofibrosis -> Marrow scarring-> Bone scarring

METHODS

- Retrospective analysis of 159 myelofibrosis patients who had HCT at the Fred Hutchinson Cancer Center between 2013- 2023.
- Gathered reticulin fibrosis and osteosclerosis presence and grade before transplant (Grade 0 = none, 1 = mild, 2 = moderate, 3 = severe).
- DEXA scan results of the spine, femur, and hip at day 100 and 1-year post-HCT were recorded.
- Multivariate logistic regression models were fit to assess the associations between characteristics and odds of developing osteopenia.

RESULTS

Table 1: Demographics

	Entire cohort
N = 159	
Age (Median (range))	60 years (range 6-74)
Sex (Male)	56%
Weight (Median (range))	80 kg (range 20-72)
Bone Marrow Fibrosis Grade	
Mild (1)	n = 14
Marked (2-3)	n = 145
Osteosclerosis present pre-HCT	
Yes	81%
No or not mentioned	19%
Acute GVHD Grade II-IV	
Yes	n = 115
No	n = 44
Chronic GVHD	
Yes	n = 81
No	n = 72
Prednisone > 0.5mg/kg	
Yes	n = 90
No	n = 68

Figure 1: Odds of Osteopenia or Osteoporosis Being Diagnosed at 100-Days post-HCT

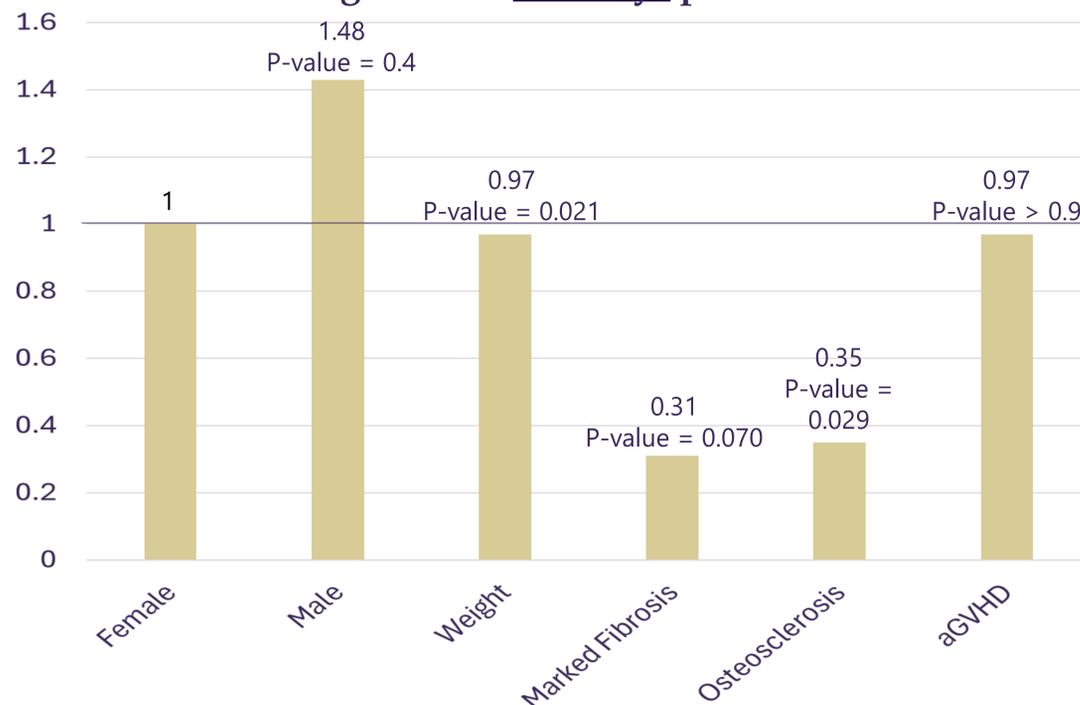
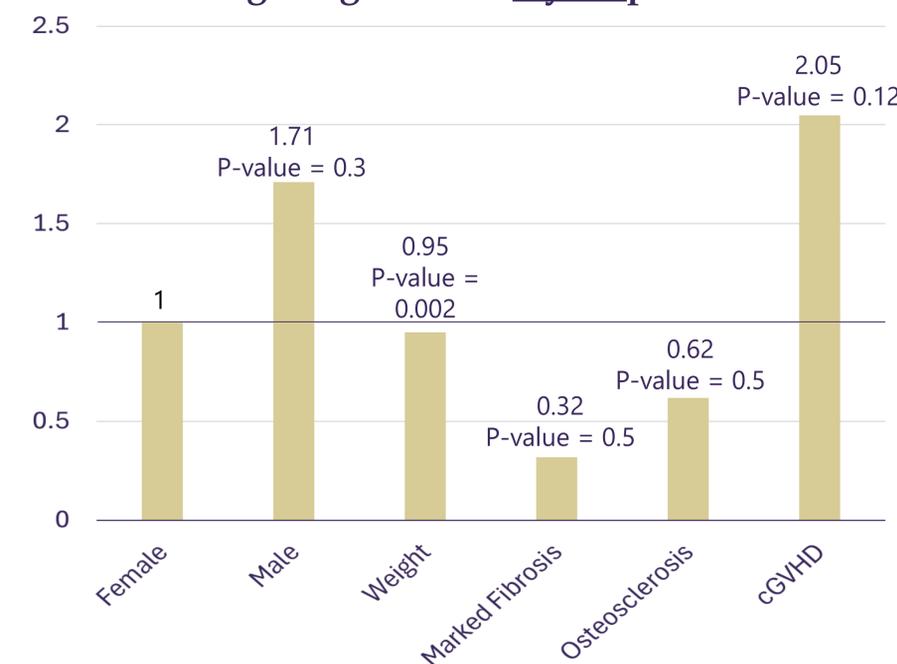


Figure 2: Odds of Osteopenia or Osteoporosis Being Diagnosed at 1-year post-HCT



CONCLUSION

- Of patients who underwent hematopoietic cell transplant, those with **moderate to severe fibrosis and osteosclerosis had significantly lower odds of being diagnosed with osteopenia or osteoporosis by DEXA.**
- Underdiagnosis may lead to **undertreatment** and therefore **increase their risk of future fractures.**
- Males had 48% higher odds at 100 days, and 71% at 1 year.
- Chronic GVHD increased odds by 205% at 1 year.

ACKNOWLEDGMENTS

- I would like to thank Dr. Rachel Salit for her guidance, Danny Burns for statistical consultation, and UWSOM/Fred Hutch Cancer Center for institutional support and funding.