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Differences in Clinical Outcomes after Fracture Hospitalization in Elderly Men and Women

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Introduction

- As risk of fragility fracture (fx) is higher in women than in men, most osteoporosis (OP) -related studies and treatments focus on women.
- However, more than 1/4 of fragility fxs occur in men, and consequences may be more severe.
- This study assessed differences in clinical outcomes between men and women after a fx hospitalization among elderly Medicare beneficiaries.

Methods

- The US Medicare 2013-2015 100% OP database were used.
- Medicare beneficiaries hospitalized for fragility fx (fx was the primary diagnosis in the claim) in 2014 were included. Fxs included hip, vertebral, and non-hip non-vertebral (NHNV, including radius and ulna, humerus, tibia and fibula, femur, ankle, pelvis, and clavicle) fxs. We also required, at the fx hospitalization, patients were
  - 66 years or older, and
  - Covered by Medicare for at least 1 year prior
- Patient characteristics were assessed in the one year baseline period before fx hospitalization. Patient characteristics included
  - demographics (age, race, and geographic regions), and
  - clinical factors for fx (hospital days, comorbid conditions, glucocorticoid use, durable medical equipment [DME] use, OP medication use, and previous fx).
- Patient were followed from hospital discharge to the earliest date of death, loss of Medicare coverage, or 1 year.
- Outcomes included death at discharge of the fx hospitalization; re-hospitalization within 1 month of discharge; and death, hospitalization, and fx-related hospitalization within 1 year after fx hospitalization discharge.
- Differences in outcomes between men and women were assessed using statistical models (logistic regression model for death at discharge and 1 month readmission, Poisson regression model for 1 year hospitalization and 1 year fx-related hospitalization, and Cox regression model for 1 year survival) with adjustment of demographics and clinical factors.
- The analyses were performed for all patients who had a fx hospitalization, patients who had a hip fx hospitalization, patients who had a vertebral fx hospitalization, and patients who had a NHNV fx hospitalization, respectively.

Results

- 269,614 patients had hospitalization for fx and satisfied all inclusion criteria. Among them, 25.2% were men; 57.5% had hospitalizations for hip fx, 16.4% for vertebral fx, and 26.1% for NHNV fx. However, among men, hip fx was 62.3%, vertebral 18.8%, and NHNV 18.9%; and hip 55.9%, vertebral 15.6%, and NHNV 28.6% among women.
- Men were younger (mean age 81.9 vs 83.2 yrs), with more days in hospital (mean 4.0 vs 3.2 days), more comorbidity (mean Charlson comorbidity index score 2.3 vs 1.6), but less prior OP medication use (3.2% vs 11.6%) and less previous fx (7.0% vs 8.4%). Differences among hip, vertebral, and NHNV fx cohorts were small (Table 1 shows only information for overall and hip fx patients due to the limited space).
- About 2% of patients died at discharge; 15% were readmitted within 1 month; 1-yr rates of death, hospitalization, and fx-related hospitalization were 32.3, 98.3, and 15.2 per 100 pt-yrs, respectively.
- Comparing men with women, odds ratios for death discharge and re-hospitalization within 1 month were 1.98 and 1.38; hazard ratio and rate ratios for 1-yr survival, hospitalization, and fx-related hospitalization were 1.55, 1.25, and 0.97. Results for Hip fx patients are almost identical and slightly different for vertebral and NHNV fx patients (Figure 1, results for any fx group are not shown).
- Comparisons varied by race; risk increased more for Asian men in general (Figure 1).

Figure 1. Male vs Female Odds/Rate/Hazard Ratios and 95% CIs of Clinical Outcomes, Overall and by Race, in Hip, Vertebral, and NHNV Fracture Cohorts
(Some 95% CIs for death discharge were trimmed by 3.5)

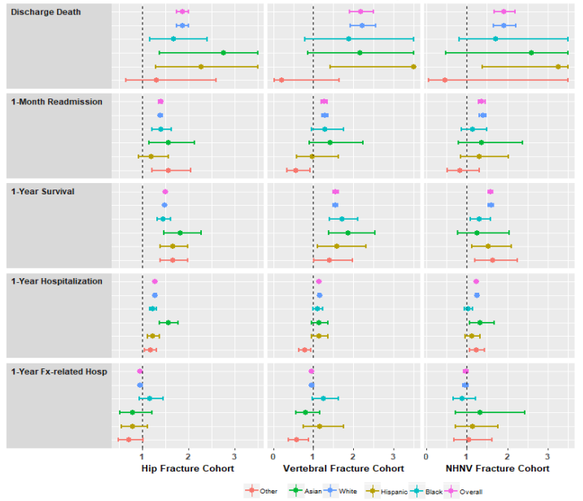

Table 1. Patient Demographics and Risk Factors for Clinical Outcomes

Variables	Any Fracture		Hip	
	Male	Female	Male	Female
Overall N (Column percent)	68010(100.00)	201604(100.00)	42398(100.00)	112599(100.00)
Age; Mean(SD)	81.87(7.97)	83.20(8.03)	82.36(7.85)	83.79(7.87)
Age category				
66-69 yrs	5705(8.39)	12779(6.34)	3050(7.19)	5911(5.25)
70-74 yrs	8601(12.65)	21217(10.52)	4912(11.59)	10401(9.24)
75-79 yrs	11099(16.32)	29631(14.70)	6777(15.98)	15859(14.08)
80+ yrs	42605(62.65)	137977(68.44)	27659(65.24)	80428(71.43)
Race; N (%)				
White	62779(92.31)	187730(93.12)	39160(92.36)	105325(93.54)
Black	2598(3.82)	6220(3.09)	1699(4.01)	3350(2.98)
Asian	678(1.00)	2411(1.20)	377(0.89)	1161(1.03)
Hispanic	885(1.30)	2589(1.28)	543(1.28)	1352(1.20)
Other	1070(1.57)	2654(1.32)	619(1.46)	1411(1.25)
Census region				
Northeast	12464(18.33)	38793(19.24)	7428(17.52)	20992(18.64)
Midwest	16781(24.67)	48572(24.09)	10230(24.13)	26473(23.51)
South	27021(39.73)	82316(40.83)	17368(40.96)	47174(41.90)
West	11636(17.11)	31613(15.68)	7298(17.21)	17748(15.76)
Missing	108(0.16)	310(0.15)	74(0.17)	212(0.19)
Charlson comorbidity index; Mean(SD)	2.25(2.46)	1.64(2.07)	2.14(2.35)	1.59(2.02)
Charlson index categories				
0	21886(32.18)	83722(41.53)	14059(33.16)	48263(42.86)
1-2	21384(31.44)	66382(32.93)	13528(31.91)	36742(32.63)
3+	24740(36.38)	51500(25.55)	14811(34.93)	27594(24.51)
Pre-index hospital days; Mean(SD)	4.03(10.05)	3.15(8.46)	3.85(9.71)	2.97(8.23)
Pre-index hospital days categories				
0	41919(61.64)	134098(66.52)	26814(63.24)	76929(68.32)
1-4	9760(14.35)	27547(13.66)	5831(13.75)	14672(13.03)
5+	16331(24.01)	39959(19.82)	9753(23.00)	20998(18.65)
Other Clinical Factors				
Any fracture in baseline period	4774(7.02)	16906(8.39)	2014(4.75)	7114(6.32)
Any OP medication use in baseline period	2189(3.22)	23379(11.60)	1074(2.53)	11485(10.20)
DME use in baseline period	9237(13.58)	26806(13.30)	5525(13.03)	13900(12.34)
Glucocorticoid use in baseline period	18945(27.86)	62297(30.90)	10764(25.39)	31103(27.62)
Ambulance life support in baseline period	12930(19.01)	38300(19.00)	7905(18.64)	20684(18.37)
CV disease in baseline period	30368(44.65)	73591(36.50)	18502(43.64)	39570(35.14)
COPD in baseline period	10662(15.68)	27843(13.81)	6469(15.26)	14499(12.88)
Anemia in baseline period	12846(18.89)	32799(16.27)	7774(18.34)	17243(15.31)
Depression in baseline period	5521(8.12)	22056(10.94)	3400(8.02)	11819(10.50)
Falls in baseline period	7321(10.76)	24090(11.95)	4310(10.17)	12637(11.22)

Conclusions

- After hospitalization for fx, men have higher risk of death discharge, re-hospitalization, and 1-yr death and hospitalization than women, but not 1-yr fracture-related hospitalization.
- Risk difference varies among race groups and fx cohorts.
- Differences between men and women and difference variations observed here may exist for healthcare resource utilization and medical cost also.
- More attention to men regarding fracture prevention and post-fracture care is necessary.
- This is an observational study, unmeasured confounders may exist and the associations found between men and clinical outcomes cannot be interpreted as causal relationships. This requires further study to understand the association.