RWD11

Fracture Incidence and Economic Burden of Female Patients With Osteoporosis at Very High Risk of Fracture in China

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INTRODUCTION

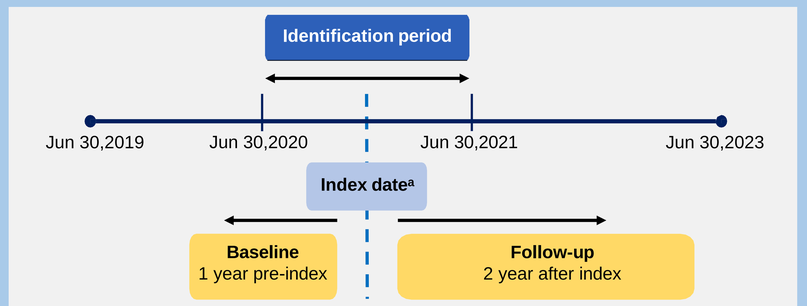
- Compared to patients with Osteoporosis (OP), those with OP at very high risk of fracture (VHRF) face worse treatment conditions and bear heavier economic burden. In the USA, only 16.8% of patients with OP at VHRF received anti-osteoporosis treatment.
- However, the fracture incidence and economic burden of OP at VHRF were still unknown in China. Better understanding of the real-world clinical characteristics and economic burden of OP at VHRF is important to improve the disease management in China.

OBJECTIVES

- **To investigate the real-world fracture incidence and economic burden of female patients with Osteoporosis at very high risk of fracture in China.**

METHODS

- **Data were obtained from Tianjin Healthcare Big Data Super Platform (2019-2023), which had covered records of patient visits to 40 tertiary hospitals and 30 secondary hospitals in Tianjin, covering about 17 million patients as of 2023.**
- **Patients aged ≥50 years with diagnosis of OP (ICD-10 codes M80.x or M81.x) supplemented with Chinese descriptions were identified during the identification period (Jun 30, 2020 to Jun 30, 2021) .**
  - The identification criteria for VHRF were based on the Guidelines for the Diagnosis and Treatment of Primary Osteoporosis in China (2022). The VHRF patients' index date was the earliest VHRF diagnosis date, with a 12-month baseline and ≥2 years of follow-up until study end, death, or loss to follow-up. OP patients who didn't have any diagnosis of VHRF during the selection period were classified as the high risk of fracture (HRF) group.



a) Index date: the date of the first VHRF diagnosis for VHRF group; the date of the first OP diagnosis for HRF group

Figure 1. Overview of the study period

- Fracture outcomes included the total number of fractures, fracture incidence, number of patients with fractures, mean number of fractures per patient with fractures, fracture frequency, distribution of fracture sites, and fracture-related complications during follow-up.
- OP-specific and all-cause helathcare resource utilization were estimated during the follow-up period.

RESULTS

1. Fracture incidence

- 44,493 OP patients were identified, among whom 11,433 (25.7%) were diagnosed with VHRF. The mean (SD) age was 66.6 (9.83) years in VHRF patients and 65.0 (9.18) years in the HRF group.
- In first year of follow-up, the fracture incidence among VHRF patients was 136.11 per 100 person years while the HRF group was 1.44 per 100 person years (P < 0.01). The proportion of ≥4 fracture counts of VHRF patients was significantly higher than HRF group (10.65% vs 5.00%, P < 0.01). Among surgical complications, subsequent fracture was the most common event in both follow-up years 1 and 2, and the proportion was higher in the VHRF group than in the HRF group (year 1: 43.40% vs 32.19%, P<0.001; year 2: 44.78% vs 29.53%, P<0.001).

Table 1. Fracture outcomes and fracture-related clinical complications during follow-up

	Overall N=44,493	VHRF N=11,433	HRF N=33,060	P value
Follow-up year 1				
Total number of fractures	16037	15562	475	
Fracture incidence, per 100 person-years	36.04	136.11	1.44	<0.001
Number of patients with fractures	8318 (18.70%)	7998 (69.96%)	320 (0.97%)	<0.001
Mean number of fractures per patient with fractures	1.93±1.82	1.95±1.85	1.48±0.85	<0.001
Distribution of fracture frequency				<0.001
1	4744 (57.03%)	4527 (56.60%)	217 (67.81%)	
2	2062 (24.79%)	1992 (24.91%)	70 (21.88%)	
3	644 (7.74%)	627 (7.84%)	17 (5.31%)	
≥4	868 (10.44%)	852 (10.65%)	16 (5.00%)	
Medical complications				
Constipation	252 (3.03%)	244 (3.05%)	8 (2.50%)	0.691
Urinary tract infection	330 (3.97%)	320 (4.00%)	10 (3.12%)	0.521
Stroke	88 (1.06%)	86 (1.08%)	2 (0.62%)	0.622
Pneumonia	452 (5.43%)	438 (5.48%)	14 (4.38%)	0.468
Electrolyte disturbances	602 (7.24%)	575 (7.19%)	27 (8.44%)	0.462
Pressure ulcer	43 (0.52%)	40 (0.50%)	3 (0.94%)	0.501
Surgical complications				
Osteoarthritis	678 (8.15%)	656 (8.20%)	22 (6.88%)	0.455
Subsequent fracture	3574 (42.97%)	3471 (43.40%)	103 (32.19%)	<0.001
Hematoma/Infection	132 (1.59%)	126 (1.58%)	6 (1.88%)	0.847
Osteonecrosis of the femoral head	61 (0.73%)	57 (0.71%)	4 (1.25%)	0.441
Follow-up year 2				
Total number of fractures	2236	1643	593	
Fracture incidence, per 100 person-years	5.03	14.37	1.79	<0.001
Number of patients with fractures	1073 (2.41%)	670 (5.86%)	403 (1.22%)	<0.001
Mean number of fractures per patient with fractures	2.08±2.09	2.45±2.47	1.47±0.97	<0.001
Distribution of fracture frequency				<0.001
1	654 (60.95%)	370 (55.22%)	284 (70.47%)	
2	200 (18.64%)	115 (17.16%)	85 (21.09%)	
3	66 (6.15%)	51 (7.61%)	15 (3.72%)	
≥4	153 (14.26%)	134 (20.00%)	19 (4.71%)	
Medical complications				
Constipation	31 (2.89%)	20 (2.99%)	11 (2.73%)	0.957
Urinary tract infection	69 (6.43%)	51 (7.61%)	18 (4.47%)	0.057
Stroke	17 (1.58%)	13 (1.94%)	4 (0.99%)	0.341
Pneumonia	86 (8.01%)	59 (8.81%)	27 (6.70%)	0.265
Electrolyte disturbances	118 (11.00%)	77 (11.49%)	41 (10.17%)	0.570
Pressure ulcer	3 (0.28%)	3 (0.45%)	0 (0.00%)	0.454
Surgical complications				
Osteoarthritis	147 (13.70%)	117 (17.46%)	30 (7.44%)	<0.001
Subsequent fracture	419 (39.05%)	300 (44.78%)	119 (29.53%)	<0.001
Hematoma/Infection	27 (2.52%)	20 (2.99%)	7 (1.74%)	0.288
Osteonecrosis of the femoral head	12 (1.12%)	11 (1.64%)	1 (0.25%)	0.071

- vertebral fractures were the most common fracture site in both groups (year 1: 30.32% vs 29.47%, P=0.693; year 2: 35.91% vs 27.66%, P<0.001).

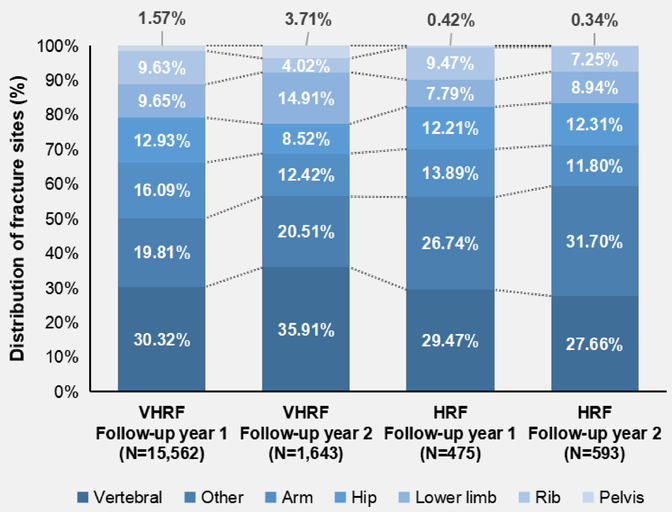


Figure 1. Distribution of fracture sites during follow-up

2. Economic burden

- In first year of follow-up, the annual OP-specific hospitalization visits, outpatient visits and total direct medical costs (mean±SD) between VHRF and HRF group were 0.42±0.77 vs 0.10±0.45 (P < 0.01), 2.79±4.63 vs 2.28±4.22 (P < 0.01) and ¥14,152±37,173 vs ¥3,362±15,592 (P < 0.01), respectively.

Table 2. OP-specific and all-cause helathcare resource utilization during follow-up

	Overall N=44,493	VHRF N=11,433	HRF N=33,060	P value
OP-specific				
Follow-up year 1				
Total number of inpatient	6370 (14.32%)	3789 (33.14%)	2581 (7.81%)	<0.001
Annual average number of hospitalizations per person	0.18±0.57	0.42±0.77	0.10±0.45	<0.001
Annual average number of hospital stays per person	2.95±21.11	5.87±24.25	1.93±19.81	<0.001
Total number of outpatient	32475 (72.99%)	8892 (77.77%)	23583 (71.33%)	<0.001
Annual average number of outpatient visits per person	2.41±4.33	2.79±4.63	2.28±4.22	<0.001
Annual per capita total direct medical costs	6135±23620	14152±37173	3362±15592	<0.001
Annual average hospitalization cost per person	4783±23431	12469±37123	2125±15323	<0.001
Annual average outpatient cost per person	1352±3474	1683±4200	1237±3176	<0.001
Follow-up year 2				
Total number of inpatient	1068 (2.40%)	439 (3.84%)	629 (1.90%)	<0.001
Annual average number of hospitalizations per person	0.03±0.24	0.05±0.33	0.02±0.20	<0.001
Annual average number of hospital stays per person	0.52±7.49	0.78±10.82	0.43±5.92	<0.001
Total number of outpatient	8741 (19.65%)	2104 (18.40%)	6637 (20.08%)	<0.001
Annual average number of outpatient visits per person	0.68±2.54	0.83±3.47	0.63±2.12	0.002
Annual per capita total direct medical costs	1079±9489	1661±14055	877±6947	0.269
Annual average hospitalization cost per person	643±9170	1085±14120	490±6644	<0.001
Annual average outpatient cost per person	435±2179	577±2992	387±1813	<0.001
All-cause				
Follow-up year 1				
Total number of inpatient	10094 (22.69%)	4398 (38.47%)	5696 (17.23%)	<0.001
Annual average number of hospitalizations per person	0.33±0.83	0.54±0.97	0.25±0.77	<0.001
Annual average number of hospital stays per person	4.95±24.92	7.99±29.92	3.90±22.84	<0.001
Total number of outpatient	41124 (92.43%)	10401 (90.97%)	30723 (92.93%)	<0.001
Annual average number of outpatient visits per person	8.90±20.67	10.10±23.26	8.49±19.68	0.006
Annual per capita total direct medical costs	13581±36741	22206±51782	10598±29237	<0.001
Annual average hospitalization cost per person	7907±31713	15854±47980	5159±22980	<0.001
Annual average outpatient cost per person	5673±17540	6352±18652	5439±17133	0.318
Follow-up year 2				
Total number of inpatient	2467 (5.54%)	898 (7.85%)	1569 (4.75%)	<0.001
Annual average number of hospitalizations per person	0.08±0.46	0.12±0.52	0.07±0.43	<0.001
Annual average number of hospital stays per person	1.31±12.07	1.79±15.82	1.14±10.46	<0.001
Total number of outpatient	21979 (49.40%)	5211 (45.58%)	16768 (50.72%)	<0.001
Annual average number of outpatient visits per person	5.17±18.27	5.57±19.66	5.03±17.76	<0.001
Annual per capita total direct medical costs	5109±22884	6260±29741	4710±19957	<0.001
Annual average hospitalization cost per person	1640±15392	2572±23598	1318±11219	<0.001
Annual average outpatient cost per person	3468±15584	3688±16395	3393±15294	<0.001

CONCLUSION

- **More than one-quarter of OP patients were identified as VHRF associated with much higher fracture incidence, multiple fracture rate and economic burden in China, leading to substantial clinical and economic burden to the Chinese health care system. Enhanced attention and targeted management are needed for these patients.**

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