

Osteoporosis Identification and Treatment among Previously Undiagnosed Patients with Vertebral Fractures

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Background: Osteoporosis

- Affects 9% of people > 50 y.o. ¹
 - > 200 million women worldwide
- Increases in prevalence with age
 - 40% of women by age 80 ²
- > 89 million fractures/year ³

Purpose

- Describe osteoporotic spine fracture (OPSF) prevalence on imaging in a primary cohort of patients with back pain

Purpose (cont'd)

- Find out how often patients with spine fx & no prior OP hx:
 - Get bone densitometry (DEXA) scan
 - Receive initial diagnosis of OP
 - Start OP medication

Materials and Methods

- Data from Lumbar Imaging with Reporting of Epidemiology (LIRE) study ⁴
 - Pragmatic cluster randomized trial
 - Primary care pts from 4 integrated HCS
 - PCP-ordered L-spine XR, CT or MRI
 - 3-yr period (10/2013 - 9/2016)

Materials and Methods

(cont'd)

- Men \geq 50 and women \geq 52 years age
- Used machine learning Natural Language Processing (NLP) to identify patients with OPSF
 - \geq 1 vertebral fx on index imaging exam

Methods: NLP

- Computer processes/analyzes large amounts of natural language data
- Rule-based algorithm utilized
- Accuracy measures:
 - Se: 96%, Sp: 99%
 - PPV: 89%, NPV: 99%

Methods: Exclusion Criteria

- Patients with non-OPSF (severe trauma or cancer)
- Pts already identified as having OP

Methods: Exclusion Criteria (cont'd)

- Hx in previous 12 months of:
 - Severe trauma
 - Dx codes for OP, OPSF, or CA
 - DEXA procedure codes
 - Prior Rx for OP meds

Methods: Identify new diagnoses

- Within 12 months after index imaging, had at least one:
 - CPT code for DEXA scan
 - ICD diagnosis code for OP
 - Rx for OP meds

Results

- 238,836 total LIRE patients
- 17,704 pts (7.4%) had spine fx on index imaging
 - 49% of fx pts (n=8718) met inclusion criteria (i.e., presumed OPSF)

OSTEOPOROSIS ANALYSIS

LIRE patients (n = 238,886)

EXCLUSIONS:

No fx on index: n=221,182 (92.6%)
Age M <50, F <52: n=2459 (14%) (3 ngi)
Severe trauma: n=0 (0%)
ICD for OP/OPFX past yr: n=4184 (27%)
ICD indicating CA: n=1490 (13%)
CPT for DEXA past yr: n=111 (1%)
OP med Rx past yr: n=137 (6.5%)
Osteopenia Dx past yr: n=605 (6.5%)

REMAINING PTS: n = 8718

Results (cont'd)

- After 12 months:
 - 19% (n = 1677) had DEXA scan
 - 35% (n = 3075) received OP dx
 - 9% (n = 753) had Rx for OP meds

Results (cont'd)

- 46% (n = 4053) had DEXA scan, OP dx code, or Rx for OP meds
- 54% of pts w/ fx on index imaging (n = 4665) had no indication that OP was recognized or treated

Conclusion

- Only 46% of PCP with fx on spine imaging received *de novo* OP dx, DEXA scans and/or anti-OP Rx within the next year

Conclusion (cont'd)

- A large proportion of patients with potentially identifiable OP remain undiagnosed

Limitations

- Ascertainment of OP fx
- Definition of fx may vary
- Rx may be filled outside of HCS
- Coding may not be detected
- May be appropriate reason why patient not on OP meds

References

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4. Jarvik JG, et al. **Lumbar Imaging With Reporting Of Epidemiology (LIRE) – Protocol for a pragmatic cluster randomized trial.** *Contemp Clin Trials* 2015; **45**(PtB): 157-63.