



Secondary causes for osteoporosis significantly contribute to fracture risk in patients with osteopenia and a recent fracture

Frank Malgo^{1,4}, Natasha M. Appelman-Dijkstra^{1,4}, Frank Termaat², Huub J.L. van der Heide³, Inger B. Schipper², Neveen A.T. Hamdy^{1,4}

Departments of Endocrinology and Metabolic Diseases¹, Traumatology², Orthopedic Surgery³ and Center for Bone Quality⁴, Leiden University Medical Center, Leiden, The Netherlands

Introduction

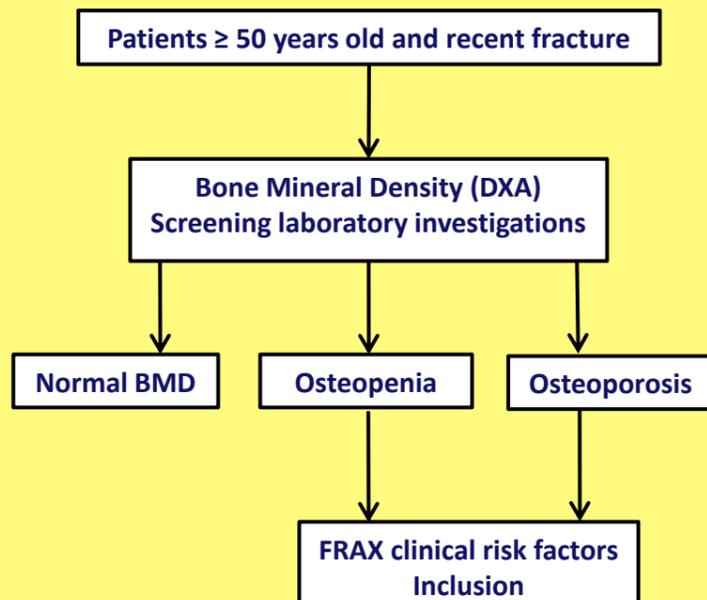
- Secondary causes for osteoporosis are prevalent in up to 60% of patients with osteoporosis and/or a fracture.
- Fractures are prevalent in patients with osteopenia.
- Data on secondary causes for osteoporosis are scarce in patients with osteopenia.

Objective

To evaluate whether secondary causes for osteoporosis are prevalent, and may contribute to fracture risk, in patients aged ≥ 50 years with osteopenia and a recent fracture.

Patients and methods

606 consecutive men and women aged ≥ 50 years presenting with a recent fracture were included in the study.



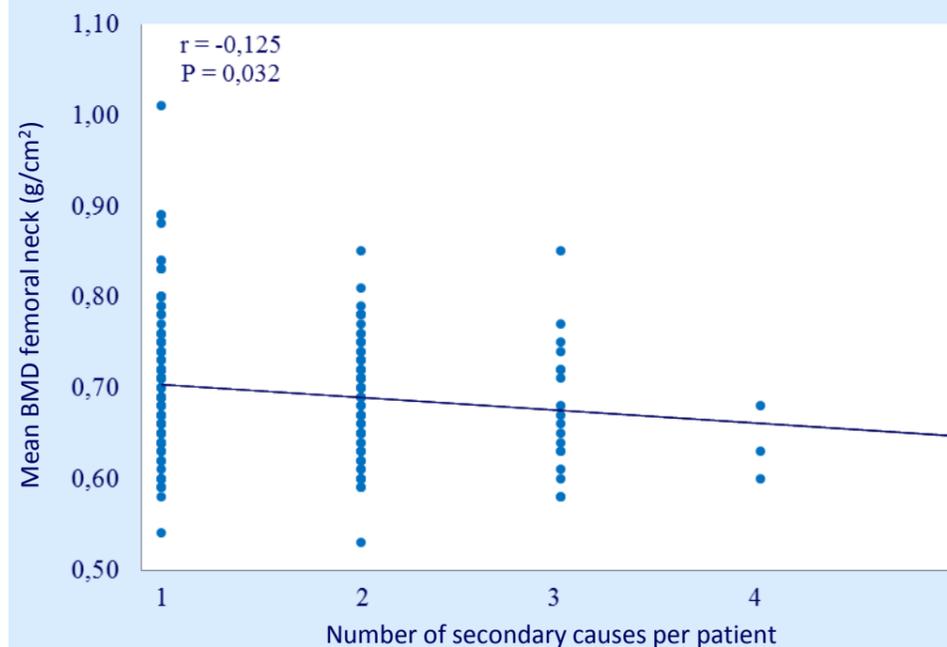
345 (57%) patients with osteopenia were used as index group
174 (29%) patients with osteoporosis were used as controls

Results

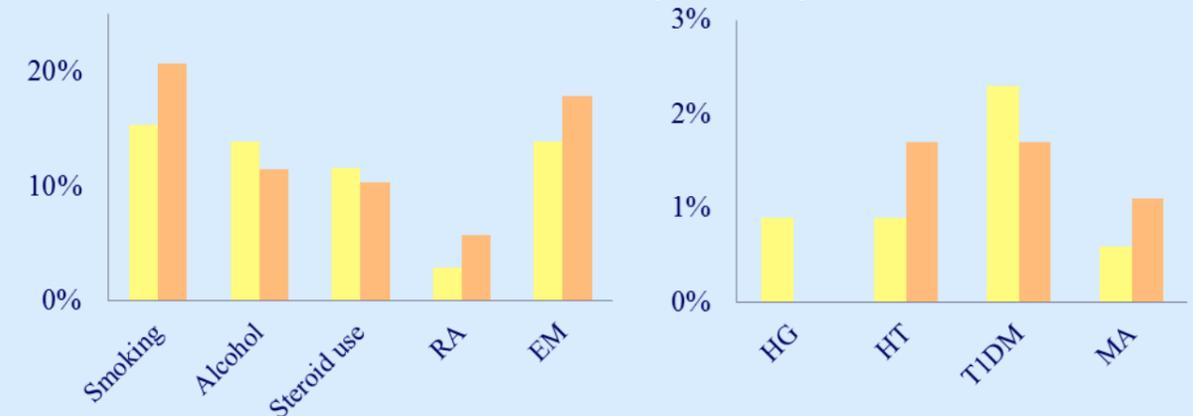
Demographic characteristics of 345 patients with osteopenia and a recent fracture

Age (years)	66,1 ± 10,0
Male/female	99/246
BMI (kg/m ²)	26,8 ± 4,1
25-OH vitamin D (nmol/L)	56,2 ± 27,1
Previous fracture VF/NVF (%)	170 (49)
FRAX score major OP fracture	10,0 ± 5,7
FRAX score hip fracture	3,1 ± 3,9

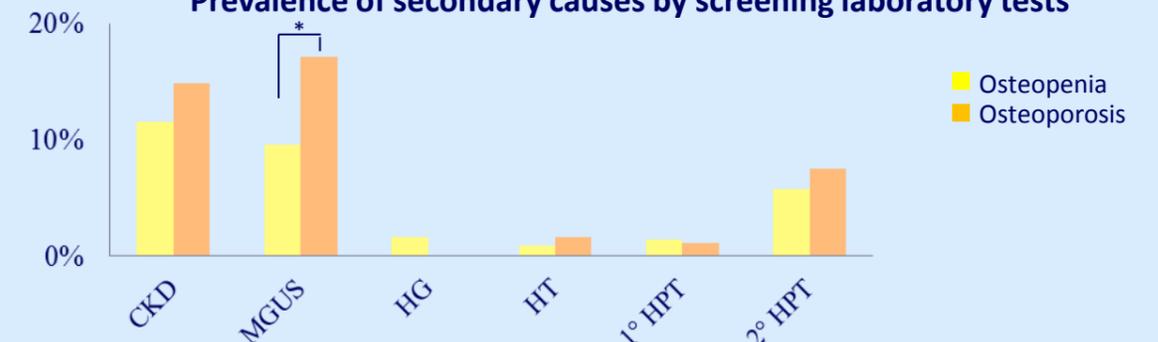
Correlation between number of secondary causes for osteoporosis and BMD at the femoral neck



Prevalence of secondary causes by FRAX



Prevalence of secondary causes by screening laboratory tests



RA rheumatoid arthritis; EM early menopause; HG hypogonadism; HT hyperthyroidism; T1DM type 1 diabetes mellitus; MA malabsorption; CKD chronic kidney disease; MGUS monoclonal gammopathy of undetermined significance; HPT hyperparathyroidism; *P < 0,05

- **76% of patients with osteopenia had ≥1 secondary cause for osteoporosis vs. 81% of patients with osteoporosis**
- 47% of patients with osteopenia had 25-OH vitamin D insufficiency vs. 44% of patients with osteoporosis
- 32% of causes amenable to lifestyle changes; 39% were treatable

Conclusion

1. Secondary causes for osteoporosis are highly prevalent in patients with osteopenia and a recent fracture, 48% of which were identifiable by FRAX and 54% by laboratory investigations.
2. Secondary causes for osteoporosis may contribute to fracture risk not only by decreasing bone mass but also by altering bone quality.

