

# **Assesment of total frakture risk in parkinsonian patients: risk reduction by evaluating and modifying single, individual risk factors**

E. Hof (1a), W. Götz (2), M. Werner (1b)  
1a Klinikzentrum Lindentallee, Abteilung für Orthopädie (Bad Schwalbach);  
1b Klinikzentrum Lindentallee, Abteilung für Neurologie (Bad Schwalbach);  
2 Parkinson-World GbR (Wildeshausen)

---

## **Problem**

Parkinson's disease is known to be an independent, specific risk factor for proximal femoral fractures (2).

Various single fracture risks, some of which cannot be modified like old age, gender, history of low impact fractures and others that can be modified like prevalent osteoporosis constitute an individual's total fracture risk (1,4,5).

Assessing total fracture risk and identifying single risk factors that will respond to treatment leads to a better understanding of the effects of various treatment options thus helping to significantly reduce total fracture risk.

Reduction of total fracture risk as one important clinical outcome measure in treating Parkinson's disease has to be kept in mind in order to cost effectively treat osteoporosis that maybe prevalent in such patients (6,8).

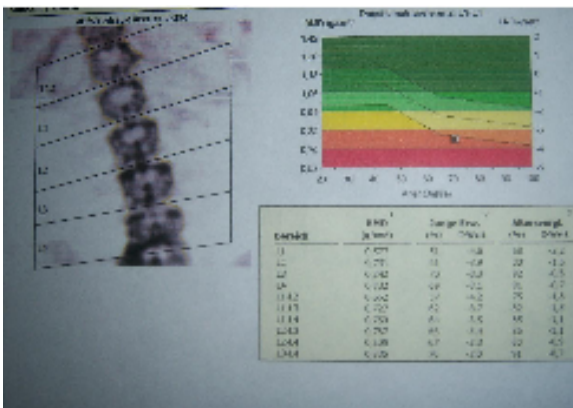
There are very few studies that have investigated the prevalence oft osteoporosis in Parkinson's disease.

We assessed the prevalence of osteoporosis in a Parkinson's disease clinical cohort as a single individual risk for fractures with regard to assessing total fracture risk and to generally recommending screening of parkinsonian patients for osteoporosis.

## Method

From 26.07.2007 – 14.08.2008 58 consenting inpatients from our neurological ward with a confirmed diagnosis of Parkinson's disease participated.

All patients had bone density measured by dual energy x-ray absorptiometry. Further data, including age, gender, ethnical background, history of multiple falling, history of dyskinesia, BMI, duration of disease, severity of disease (Hoehn-Yahr stage) were collected.



Bitte hier JPG 003 einfügen (Anlage)

Written report documenting osteoporosis



Bitte hier JPG 001 einfügen (Anlage)

Facility for measuring bone density  
DPX Lunar Bravo

## RESULTS

33 of 58 patients were men (56,9%)  
25 of 58 patients were women (43,1%)

Median age of the men: 72,7 (58-83,9)  
Median age of the women: 72,5 (53,2-93,8)

All patients had Caucasian background

Median BMI of the men: 28,6 (20-35,9)  
Median BMI of the women: 25,8 (17,9-35,6)

Mean duration of disease in whole sample: 9 years (1-25 years)

Disease severity: 44,8 % of patients had reached Hoehn-Yahr-stage 3.  
13,8 % of patients had reached a higher stage  
41,4 % of patients had reached a lower stage

History of multiple falling: 68,9 % of whole sample  
Dyskinesias: 20,7% of whole sample

## **CONCLUSIONS**

The overall prevalence of osteoporosis in parkinsonian patients is considerable. It is substantially higher compared to the normal population but does not exceed that of other people of similar age (1,3).

We generally recommend osteoporosis-screening in female parkinsonian patients who are older than 50 years and in male parkinsonian patients who are older than 60 years regardless of duration of disease and severity of disease.

In younger patients we recommend screening only if there are additional clinical risk factors like history of low impact fractures or history of multiple falling.

Total fracture risk in parkinsonian patients can substantially be reduced by identifying and treating prevalent osteoporosis that has to be regarded as one of the most important single risk factors.

### **Literature:**

- (1) Fink HA et al. Association between Parkinson' disease and low bone density and falls in older men: the osteoporotic fractures in men study. *Journal of the American Geriatrics Society* 2008;53(9): 1559-1564.
- (2) Genever RW et al. Fracture rates in Parkinson's disease compared with age – and gender- matched controls: a retrospective cohort study. *Age an Ageing* 2005; 34: 21-24.
- (3) Ishizaki F et al. Relationship between osteopenia and clinical characteristics of Parkinson's disease. *Movement Disorders* 2008; 8(4): 507-511.
- (4) Sato Y et al. Risk factors for hip fracture among elderly patients with Parkinson's disease. *Journal of the Neurological Sciences* 2001; 182 (2): 89-93.
- (5) Schroeteler F. Physiotherapeutische Interventionen bei Parkinson. *Fallneigung und Kamptokormie. Nervenheilkunde* 2008; 27 (12) : 1083-1089.
- (6) Vasermann N. Parkinson's disease and osteoporosis. *Joint Bone Spine* 2005; 72 (6): 484-488.
- (7) Wood B et al. Osteoporosis in Parkinson's disease. *Movement Disorders* 2005; 20 (12): 1636-1640
- (8) Zuckerman L. Parkinson's disease and the orthopaedic patient. *J Am Acad Orthop Surg* 2009; 17 (1): 48-55.