



# USING FRAX® AND PERIPHERAL BONE MINERAL DENSITY FOR IDENTIFYING POTENTIAL CANDIDATES FOR OSTEOPOROSIS THERAPY AMONG RHEUMATOID ARTHRITIS PATIENTS

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## Background

Rheumatoid arthritis (RA) and glucocorticoids (GC) therapy are proven risk factors (RF) for osteoporosis (OP) and osteoporotic fractures (OPF). Along with these factors, patients with RA have other diseases and conditions that can affect the increase of the risk of OPF.

## Objectives

To determine the frequency of RA in the epidemiological random sample of persons aged  $\geq 50$  years and to identify among them patients who need the prevention of OPF.

## Methods

The epidemiological sample included 18 018 people (13 941 women and 4077 men, mean age  $62 \pm 10$  years). A survey was conducted using a unified questionnaire that included possible risk factors for osteoporosis (age, body mass index, individual or family history of fragility fracture, smoking, alcohol misuse, confirmed diagnosis of RA, long-term use of GC, premature menopause, physical inactivity, disorder strongly associated with osteoporosis) and daily calcium intake with food. The 10-year probability of fracture was calculated using the FRAX®. Bone mineral density (BMD) was measured in the distal forearm using Osteometer Meditech DTX-200 as a screening method.

## Results

The prevalence of RA in the epidemiological sample was 1.7% (1.9% for women and 1.2% for men,  $p=0.0047$ ). Among the most common RF OP and OPF in RA patients were previous fractures (33%), causes of secondary OP (30%) and taking GC (18%), for men an additional factor – smoking (33%) (Tab. 1). Women with RA had significantly more concomitant diseases and other secondary causes of OP and OPF (33%) than those without RA (23%),  $p=0.0004$  (Tab. 2). More of them used GC compared to control (17% and 8%, respectively,  $p < 0.0001$ ). Among men significant differences were obtained only for the using of GC: 20% in RA patients and 5% in control group ( $p < 0.0001$ ). Other RF were found with the same frequency. The average calcium intake with food was  $683 \pm 231$  mg per day among women and  $635 \pm 276$  mg per day in men without statistical differences between RA patients and control. 20% of men and 16% of women had less than half of daily calcium intake norm ( $p=0.53$ ).

The mean FRAX® values for the major OPF in RA patients were significantly higher than those without RA:  $18.4 \pm 10\%$  and  $13.2 \pm 7.9\%$ , respectively ( $p < 0.0001$ ) for women and  $8.9 \pm 6.4$  and  $6.2 \pm 3.7$ , respectively ( $p < 0.0001$ ) for men (Tab. 2). Forty-two percent of RA patients had a high risk of OPF: 48% of women and 8% of men. The percentage of women with RA who had FRAX® above the threshold of therapeutic intervention was significantly higher than among those without RA (31%),  $p=0.00001$ . At the same time, in men, the frequency of high fracture risk was the same in patients with RA and without RA (8 and 5%, respectively,  $p > 0.05$ ).

OP in the distal forearm was diagnosed in 47% RA women and 20% RA men compared to control: in 22% women ( $p < 0.0001$ ) and 19% men ( $p > 0.05$ ) (Fig. 1). Among RA patients, 13% of women and 20% of men had low FRAX® and OP in the distal forearm.

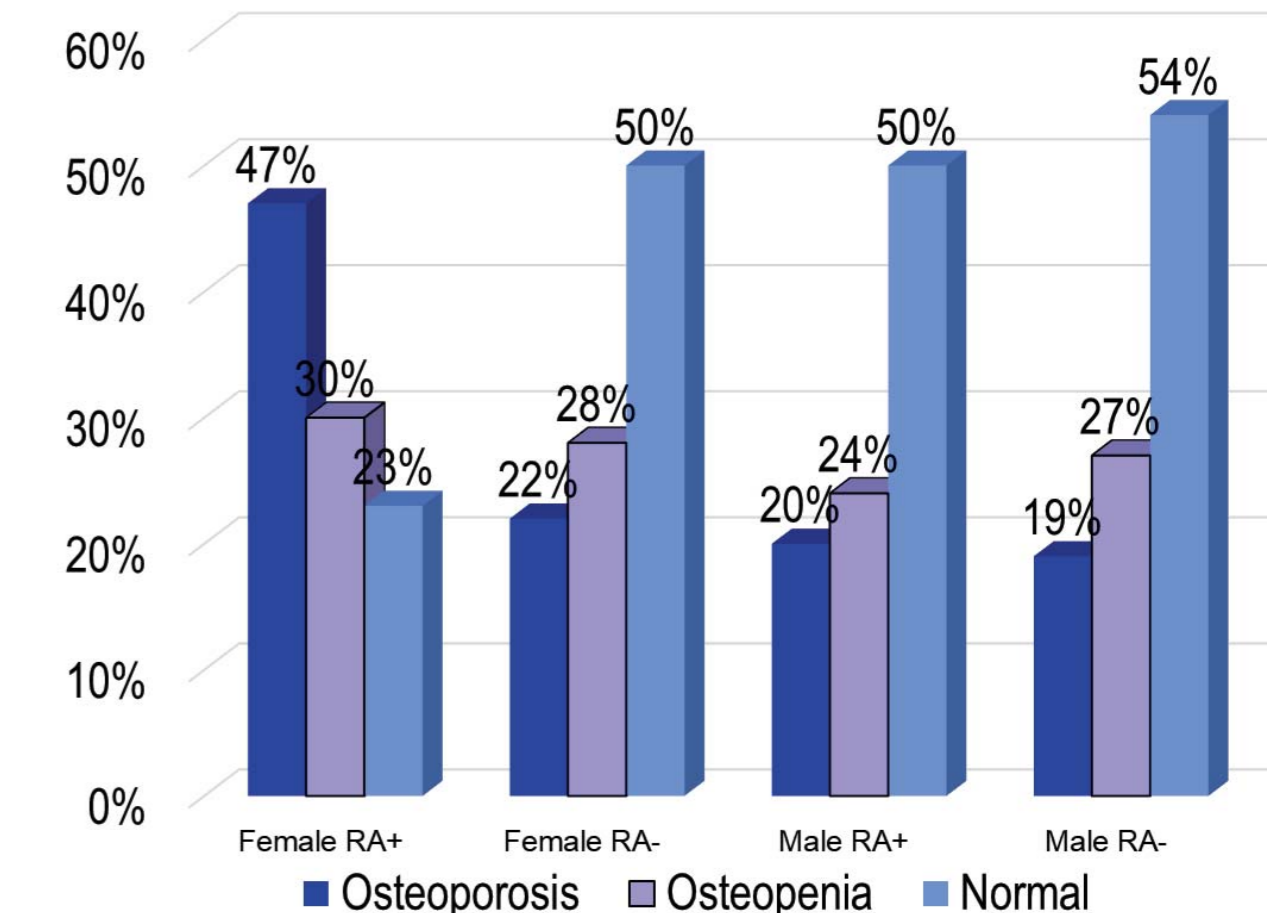
## Conclusions

Every third woman with RA had at least one more comorbid disease or condition associated with an increased risk of OPF and about every second – low BMD. 48% of women and 8% of men with RA had a high risk of OPF and needed prevention of OP. Additionally, among RA patients, 13% of women and 20% of men with low BMD in the distal forearm require axial densitometry.

**Tab.1 RF for OP and OPF in RA patients and control**

Characteristics	RA (n=310)	Control (n=17708)	p
BMI $< 20$ kg/m <sup>2</sup> , n(%)	8(2,6)	364(2,1)	0,51
Previous fracture, n(%)	101(32,6)	5105(28,8)	0,15
Glucocorticoids, n(%)	54(17,4)	2228(12,6)	0,01
Current smoking, n(%)	31(10,0)	2049(11,6)	0,39
Secondary osteoporosis, n(%)	94(30,3)	3680(20,8)	$< 0,001$
Alcohol 3 or more units/day, n(%)	5(1,6)	264(1,5)	0,8
High risk of OPF, n(%)	130(41,9)	4396(24,8)	$< 0,001$

**Fig.1 Frequency of OP and osteopenia in women and men with and without RA according to peripheral densitometry**



**Tab.2 RF for OP and OPF in RA patients and control depending on the sex**

Characteristics	FEMALE			MALE		
	RA + n=261(1,9%)	RA - n=13680	p	RA + n=49 (1,2%)	RA - n=4028	p
Age, mean (SD), yrs	60,9(9,7)	63,1(9,1)	0,00001	62,0 (10,3)	62,6(10,2)	0,9
BMI $< 20$ kg/m <sup>2</sup> , n(%)	6(2,2)	245(1,8)	0,7	2(4)	119(3)	0,96
Previous fracture, n(%)	89(34)	4130 (30)	0,2	12(24)	975(24)	0,9
Glucocorticoids, n(%)	44(17)	1051(7,7)	0,0001	10(20)	190(5)	0,00001
Current smoking, n(%)	15(5,7)	872(6,4)	0,78	16(33)	1177(29)	0,6
Secondary osteoporosis, n(%)	86(33)	3211 (23)	0,0004	8(16)	469(12)	0,3
Alcohol 3 or more units/day, n(%)	2(0,8)	57(0,4)	0,7	3(6)	207(5,1)	0,9
Calcium intake, mean(SD),mg/d	689(341)	685(248)	0,07	634(289)	637(252)	0,9
FRAX®, mean(SD),%	18,4(10)	13,2(7,9)	0,001	8,9(6,4)	6,2(3,7)	0,0001
High risk of OPF, n(%)	126 (48)	4196(31)	0,0001	4(8)	200(5)	0,95