PECULIARITIES OF BONE MINERAL DENSITY AND BODY COMPOSITION IN WOMEN WITH RHEUMATOID ARTHRITIS COMPARED TO WOMEN WITHOUT RHEUMATOID ARTHRITIS

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Background

- Rheumatoid arthritis (RA) – chronic inflammation disease with articular involvement associated with decrease in bone mineral density (BMD), fat and muscle mass [1].

- Specific features of BMD and body composition in women with RA vs those without RA are not well understood.

Objective

to establish specific features of BMD, body composition and skeletal muscle changes in middle-aged and elderly women with RA compared to women without RA.

Methods

Study subjects:
- *Women with RA (ACR criteria 1987),*
- *≥ 18 years*
- *Hospitalized to the City Clinical Hospital #4, Ivanovo.*

Study design: *observational study*

Study measures:
- BMD in spine and femur and body composition was assessed using LunarProdigy device (GeneralElectric).
- BMD was estimated according to T-score. *Osteopenia* was defined as T-score -1 to -2.5 σ; *osteoporosis* was defined as T score ≤-2.5 σ.
- Obesity was detected if fat mass estimate was ≥32%.
- Sarcopenia was defined as lean mass index (LMI)<5.64 kg/m².

Statistical Analysis:

Descriptive characteristics (means, percentages, etc.) were used to summarize characteristics of the cohorts. Comparisons of characteristics between cohorts were made with Chi-square and Fisher tests.

Patient Characteristics

- The study included 86 women with RA aged 59.06±7.52 years and 81 women without RA aged 57.4±5.3 years. Most of patients had rheumatoid factor (RF) positive RA (76.7%), mild-moderate disease activity (90.7%), II radiologic stage (65.1%), I-II functional classes (90.7%). Duration of RA was 8.49±9.53 years.

Table 1
Body composition and mineral density in women with RA vs women without RA

Indicator	RA (N=86)	Without RA (N=81)	p
BMD of spine, g/cm²	1.05±0.18	1.05±0.15	0.13
BMD of femoral neck, g/cm²	0.85±0.13	0.92±0.11	0.0004
Lean mass, kg	38.27±5.99	40.97±5.34	0.003
Lean mass index, kg/м²	6.65±0.95	6.88±0.88	0.34
Lean mass index<5,64 kg/m², N (%)	12(13.95%)	4 (4.94%)	0.048
Fat mass, kg	28.97±10.34	33.53±10.0	0.005
Fat mass index, kg/m²	11.54±3.81	13.13±4.15	0.01
Fat mass ≥32%, N (%)	78 (90,7%)	74 (91,4%)	0.07

Table 2
Structure of body composition in women with RA vs women without RA

| Indicator	RA (N=86)	Without RA (N=81)	p
Osteopenic obesity, N/%	43 (50%)	55 (67.9%)	0.019
Osteopenic sarcopenia, N/%	5 (5.8%)	1 (1.2%)	0.11
Sarcopenic obesity, N/%	1 (1.2%)	0	0.33
Osteosarcopenic obesity, N/%	6 (7%)	3 (3.7%)	0.35

Study results

We have detected significantly lower femoral BMD (p<0.001), fat (p=0.005) and muscle (p=0.003) in women with RA compared to their non-RA counterparts (table 1). Both, women with RA and those without RA had high prevalence of low BMD meeting criteria for osteopenia or osteoporosis (Figure). There was no statistically significant difference in the prevalence of osteopenia in women with and without RA (52% and 61%, respectively; p=0.614). Osteoporosis was somewhat more common in RA vs non-RA group (39.5% and 25.9%, respectively; p=0.062).

Over 90% of women in both groups were obese (Table 1). However osteopenic obesity was less common in women with RA than those without RA (Table 2).

Based on LMI findings sarcopenia was more prevalent in women with RA (13.95%) than in those without RA (4.94%, p=0.047). In all patients sarcopenia was in combination with osteopenia/osteoporosis (osteopenic sarcopenia) or with obesity (sarcopenic obesity) or with both (osteosarcopenic obesity).

Frequency of osteoporosis and osteopenia in patients with RA

8,50%
38,50%
52%
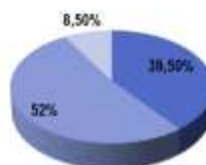
■ Osteoporosis ■ Osteopenia ■ Norm

Frequency of osteoporosis and osteopenia in patients without RA

12,90% 25,90%
61,20%

■ Osteoporosis ■ Osteopenia ■ Norm

Discussion & Conclusions

- Women with RA have higher prevalence of osteoporosis and sarcopenia compared to women without RA.

- Middle-aged and elderly women with and without RA have high prevalence of obesity (≥32% fat mass). But osteopenic obesity was less common in women with RA than those without RA .

- Assessment of the body composition by radiographic densitometry in female RA patients with osteopenia or osteoporosis may be used to detect sarcopenia and its phenotypes in order to inform prognosis and adjust the management plan.

- **Study Limitations**

Most patients in the study cohort were between 45-65 years old with mild to moderate disease activity and no significant co-morbidities. This should be considered while interpreting the findings as it may limit the generalizability of the results.

References

[1] Baker J.F., Von Feldt J., Mostoufi-Moab S. et al. Arthritis Care Res (Hoboken). – 2014. - 66(11). – P.1612-1618.