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OSTEOSARCOPENIA INCREASES THE RISK OF FALLS IN PATIENTS WITH RHEUMATOID ARTHRITIS: RESULTS OF A FOUR-YEAR LONGITUDINAL STUDY

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Background: Osteosarcopenia is defined as osteoporosis combined with sarcopenia. Both osteoporosis and sarcopenia are risk factors for falls and fractures in healthy individuals¹. The relationships of falls and fractures to osteosarcopenia in rheumatoid arthritis (RA) patients are unknown.

Objectives: The synergistic effect of osteoporosis and sarcopenia and the impact of osteosarcopenia on falls and fractures in RA patients were investigated using four years of data from a longitudinal study.

Methods: The data from a prospective, observational study (CHIKARA study: UMIN000023744) were examined. The patients were divided into four groups according to their baseline status: no sarcopenia and osteoporosis (SP-OP-); only sarcopenia (SP+OP-); only osteoporosis (SP-OP+); and both sarcopenia and osteoporosis (SP+OP+). Sarcopenia was diagnosed by the criteria of the Asia Working Group on Sarcopenia 2014². Patients with osteoporosis were defined as those having a therapeutic intervention for osteoporosis. The survival rate and Cox hazard ratio were analyzed using falls and fractures as endpoints, adjusted by age, sex, and body mass index.

Results: A total of 100 RA patients (female 78%, mean age 66.1 years) were enrolled. The number of SP-OP-, SP+OP-, SP-OP+, and SP+OP+ patients was 45, 17, 27, and 11, respectively. Their baseline characteristics are shown in Table 1. A total of 35 patients had falls, and 19 patients had fractures during the four-year follow-up. The fall-free survival rate in the SP-OP-, SP+OP-, SP-OP+, and SP+OP+ groups was 75.6%, 64.7%, 51.9%, and 36.4%, respectively; that of the SP+OP+ group was significantly lower than that of the other groups (P=0.021) (Figure 1). The fracture-free survival rate in the SP-OP-, SP+OP-, SP-OP+, and SP+OP+ groups was 86.7%, 82.4%, 81.5%, and 54.5%, respectively. That of the SP+OP+ group was relatively lower than that of the other groups (P=0.121). The hazard ratio of falls was significantly increased in the SP+OP+ group by 3.32-fold (95%CI: 1.01-10.9) compared to that in the SP-OP- group, whereas that in the SP+OP- and SP-OP+ groups was 2.58-fold (95%CI: 0.75-8.8) and 2.29-fold (95%CI: 0.94-5.6) higher, respectively. There were no significant differences compared to the SP-OP- group. The hazard ratio of fractures in the SP+OP+ group was increased 2.73-fold (95%CI: 0.61-12.2) compared to that in the SP-OP- group.

Table 1. Baseline characteristics of the four groups

	SA-OP-	SA+OP-	SA-OP+	SA+OP+	P value*
Female, %	73.3	58.8	88.9	100	0.027
Age, years	63 (49, 72)	69 (60, 79)	73 (64, 75)	73 (65, 81)	0.008
Disease duration, years	4.4 (1.0, 8.4)	4.0 (1.3, 8.9)	7.6 (1.5, 14.5)	10.5 (3.2, 26.5)	0.035
DAS28-ESR	3.14 (2.66, 3.70)	3.55 (3.01, 4.65)	3.93 (3.28, 4.63)	3.53 (2.48, 3.89)	0.01
mHAQ	0.25 (0, 0.375)	0.375 (0.125, 0.875)	0.375 (0.125, 0.875)	0.5 (0.125, 0.875)	0.065
MTX, mg/week, rate (%)	8.4 ± 2.9 (86.7)	8.7 ± 3.5 (70.6)	8.3 ± 2.8 (92.6)	6.8 ± 1.0 (90.9)	0.388
Glucocorticoid, mg/day, rate (%)	3.7 ± 1.9 (20.0)	6.3 ± 1.8 (11.8)	4.0 ± 1.7 (44.4)	3.8 ± 1.8 (18.2)	0.400
Body mass index, kg/m ²	23.4 ± 3.8	19.2 ± 2.3	21.7 ± 2.4	19.2 ± 2.0	<0.001

Data are shown as mean ± standard deviation (SD) or median (25th, 75th percentile).*: compared in four groups by Kruskal-Wallis test.

Figure 1. Fall-free survival rates of the four groups.

Conclusion: The survival rates with the endpoints of falls and fractures in RA patients with osteosarcopenia were lower during the four-year follow-up. In particular, the risk of falls increased with the synergistic effect of osteoporosis and sarcopenia in RA patients.

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