BACKGROUND: Sarcopenia is characterized by loss of muscle mass and strength, which lead to lower physical ability, less quality of life (QoL), frailty and mortality. Rheumatoid arthritis (RA) is considered to be one of the causes of sarcopenia. Objectives: To clarify the effectiveness of biologic disease modifying anti-rheumatic drugs (bDMARDs) on sarcopenia, including physical ability, body composition and nutritional status.

Methods: This is a prospective cohort study including consecutive 48 patients (male 11, female 37, age 64.2±15.1) with RA who started bDMARDs in Niigata Rheumatism Center. Diagnosis of sarcopenia was according to the diagnostic algorithm of European Working Group on Sarcopenia in Older People (EWGSOP). We monitored disease activity of RA, physical ability, body composition, nutritional status and QoL at baseline, 6 months and at 12 months. Disease activity was measured by disease activity score-28 joint count based on erythrocyte sedimentation rate (DAS28-ESR), clinical disease activity index (CDAI). Physical activity was measured by Health Assessment Questionnaire (HAQ). 10m walking test (10MWT). Nutritional status was measured by controlling nutrition status (CONUT) score, and prognostic nutritional index (PNI). Overall QoL was measured by Euro-Qol 5 dimensions (EQ5D).

Results: Among 48 patients who started bDMARDs, 21 patients were classified as having sarcopenia. The bDMARDs used were adalimumab in 10 cases, certolizumab pegol in 9 cases, golimumab in 7 cases, tocilizumab in 5 cases, rituximab in 5 cases and etanercept in 3 cases. DAS28-ESR (4.7±1.4 vs. 2.7±1.0, p < 0.001) and CDAI (18.4±9.4 vs. 7.4±5.5, p < 0.001) were significantly decreased by 12 months of bDMARDs therapy. Physical activity was significantly ameliorated after 12 months of bDMARDs; HAQ(1.1±0.9 vs. 0.6±0.8, p < 0.001), 10MWT(15.0±7 m/s vs. 17.0±6.0, p = 0.002), EQ-SD was also ameliorated(0.63±0.15 vs. 0.74±0.19, p = 0.0002). As for body composition analysis, there were significant increase in body weight(54.6±12.4 kg vs. 53.8±13.6, p=0.006), but there was no significant increase in skeletal muscle mass index(5.9±1.1 kg/m2 vs. 5.8±1.1, p = 0.229). Among 21 patients who were classified as sarcopenia when starting bDMARDs, the number of patients having sarcopenia significantly decreased after 12 months of bDMARDs (100% vs. 52.3%, p=0.0005) and skeletal muscle index of these patients were significantly increased (5.1±0.5 kg/m2 vs. 5.3±0.7 , p = 0.046).

Conclusion: Twelve months of bDMARDs therapy significantly ameliorated disease activity, nutritional status and physical activity. In RA patients with sarcopenia, bDMARDs significantly increased skeletal muscle and may be effective for treatment of sarcopenia.

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