Sarcopenia and health-related quality of life in Turkish nursing home residents: a cross-sectional study

Ahmet Yalcin, MD, Kamile Silay, MD

ABSTRACT

Background. This study aimed to assess the association between sarcopenia and health-related quality of life (HRQoL) among Turkish nursing home residents.

Methods. Residents of a Turkish nursing home were assessed in terms of the Charlson Comorbidity Index, number of drugs in use, self-reported duration of exercise per week, Mini-Mental State Examination, Geriatric Depression Scale–Short Form, Lawton instrumental activities of daily living, Mini Nutritional Assessment–Short Form, Short Form 36 Health Survey (for HRQoL), and sarcopenia status in terms of skeletal muscle mass, strength, and function.

Results. 241 older nursing home residents were included. Of them, 93 (38.9%) were sarcopenic and had a lower skeletal muscle mass index, handgrip strength, and gait speed. Compared with non-sarcopenic participants, sarcopenic participants scored lower in all subscales of SF-36. Sarcopenia was independently associated with worse physical functioning (odds ratio [OR]=1.99, p=0.003) and worse mental health (OR=1.86, p=0.034). However, all significant associations were diminished after adjusting for duration of exercise.

Conclusions. Sarcopenia was associated with worse physical functioning and mental health.

Key words: Aged; Nursing homes; Quality of life; Sarcopenia

INTRODUCTION

According to the European Working Group on Sarcopenia in Older People (EWGSOP), sarcopenia is defined as a loss of skeletal muscle mass, strength, and function. 1,2 It is a geriatric syndrome with multifactorial aetiology; hormonal and motor neuron alterations due to ageing, inflammation, sedentary lifestyle, and poor nutritional status are all involved. 3 Adverse outcomes associated with sarcopenia include frailty, falls, disability, cognitive dysfunction, and mortality. 4,5 In the USA, healthcare costs related to sarcopenia are estimated at 18.5 billion dollars. Older people living in nursing homes or long-term care facilities are at higher risk of developing sarcopenia. Health-related quality of life (HRQoL) in nursing home residents is a concern. 6 Falls and physical disabilities secondary to sarcopenia adversely affect HRQoL. 7 Sarcopenia is associated with poor HRQoL among community-dwelling older people. 7,9 This study aimed to assess the association between sarcopenia and HRQoL among Turkish nursing home residents.

METHODS

This study was approved by the ethics committee of Yildirim Beyazit University School of Medicine and conducted in compliance with the Declaration of Helsinki. Informed consent was obtained from each
This cross-sectional study was conducted between April 2015 and December 2015 in a government nursing home in Ankara, Turkey. There were 300 residents including retired government officials and their spouses. 40 residents who were in receipt of palliative care or bedbound were excluded, as were those who could not walk unaided or had severe dementia or acute illness.

Clinical features of participants were obtained from their medical records and face-to-face interviews by two geriatricians and included the Charlson Comorbidity Index (CCI), number of drugs in use, self-reported duration of exercise per week, Mini-Mental State Examination (MMSE), Geriatric Depression Scale–Short Form (GDS-SF), Lawton instrumental activities of daily living (IADL), and Mini Nutritional Assessment–Short Form (MNA-SF).

HRQoL was measured using the Short Form Health Survey (SF-36). It includes eight subscales: physical functioning, role-physical, bodily pain, general health, vitality, social functioning, role-emotional, and mental health.

The diagnosis of sarcopenia was made by two geriatricians based on the EWGSOP criteria of low skeletal muscle mass, strength, and function. Skeletal muscle mass was assessed in a supine position using bioelectrical impedance analysis (BIA) at a frequency of 50 kHz and alternating current of 800 μA, and electrodes placed on the right ankle and wrist. Participants were instructed to empty their bladder and remove all metal accessories. Skeletal muscle mass (kg) is equal to: height (cm²) / BIA resistance (Ω) x 0.401 + gender (male=1, female=0) x 3.825 + age (years) x -0.071 + 5.102. The skeletal muscle mass index is equal to the skeletal muscle mass divided by the square of height. Low muscle mass is defined as a skeletal muscle mass index of <8.87 kg/m² for men and <6.42 kg/m² for women. Handgrip strength of both hands was measured in a sitting position using a Jamar hydraulic hand dynamometer, with the elbow in 90° flexion and the wrist in a neutral position. The highest reading was used as an indicator of muscle strength. Low muscle strength was defined as handgrip strength of <30 kg for men and <20 kg for women. Muscle performance was based on the usual gait speed over a 4-m course. Low muscle performance was defined as a gait speed of <0.8 m/sec.

Continuous variables were analysed using independent sample t test or Mann-Whitney U test according to their distribution. Nominal and ordinal variables were analysed using Chi-square test. The association between HRQoL and sarcopenia was evaluated using multiple logistic regression analysis. Subscale scores of HRQoL were dichotomised into better or worse scores: physical functioning (≥75 and <75), role-physical (100 and <100), bodily pain (≥72 and <72), general health (≥67 and <67), vitality (≥75 and <75), social functioning (100 and <100), role-emotional (100 and <100), and mental health (≥84 and <84). Independent variables were age, gender, body mass index (BMI), IADL, GDS-SF, MMSE, MNA-SF; number of drugs in use, CCI, and exercise duration per week.

RESULTS
Of 260 older nursing home residents, 19 were excluded because of amputated limbs (n=1), using a walker (n=8), length of stay <1 month (n=5), severe pretibial oedema (n=1), acute illness (n=2), and severe dementia (n=2). The mean age of the remaining 241 participants was 81.89±6.27 years; 52.1% were female. According to the EWGSOP criteria, 93 (38.6%) of participants were sarcopenic and had a lower skeletal muscle mass index (6.22 vs. 9.78 kg/m², p<0.001), handgrip strength (20.06 vs. 22.78 kg, p=0.027), and gait speed (0.62 vs. 0.79 m/sec, p=0.005) compared with the non-sarcopenic group.

Compared with non-sarcopenic participants, sarcopenic participants were older (83.27 vs. 79.91 years, p=0.001), exercised for a shorter duration (88.82 vs. 117.1 hours per week, p=0.004), had a poorer IADL score (5 vs. 7, p<0.001), MMSE score (25 vs. 26.5, p=0.038), MNA-SF score (11 vs. 13, p<0.001), and CCI (5 vs. 4, p=0.04), used more drugs (7 vs. 6, p=0.029), and scored lower in all subscales of SF-36.

Sarcopenia was independently associated with worse physical functioning (odds ratio [OR]=1.95, 95% confidence interval [CI]=0.83-4.59, p=0.003) and worse mental health (OR=1.88, 95% CI=0.41-9.11, p=0.034) [Table 2], after adjusting for age, sex,
BMI, IADL, GDS-SF, MMSE, MNA-SF, CCI, and number of drugs in use. However, all significant associations were diminished after adjusting for duration of exercise (data not shown).

**DISCUSSION**

In a study of 1397 community-dwelling Korean men aged ≥50 years, sarcopenic patients had
worse HRQoL, especially in physical functioning. Sarcopenia had a greater impact on physical functioning than social functioning or mental health. In another study, individuals with both sarcopenia and osteopenia scored lower in subscales of vitality, role-physical, and role-emotional. In a study of older Brazilian women, sarcopenic and non-sarcopenic patients did not differ in SF-36 subscale scores, but handgrip strength was associated with several subscales of SF-36. The sample size was small, however, and the fat-free mass definition of sarcopenia was used. In the SarcoPhAge study, sarcopenia was associated with physical functioning after adjusting for age, sex, BMI, MMSE, MNA, CCI, and number of drugs in use. Nonetheless, specific tools are needed to assess the impact of sarcopenia on quality of life. Among residents of nursing homes and assisted living facilities, frailty was inversely associated with the physical component score and positively associated with the mental component score. Different findings between studies may be due to differences in the study population (community-dwelling vs. institutionalised), sarcopenia definition, HRQoL scale, and the presence of osteopenia.

In our study, mental health was associated with sarcopenia in addition to physical functioning. In a study of Korean elderly people, sarcopenia was independently associated with depression in men (but not women), even after adjusting for exercise. Physical inactivity due to depression may contribute to sarcopenia. Age-associated inflammation and decline in androgens may affect both the pathogenesis of sarcopenia and depression. Low levels of inflammation and oxidative stress are related to depression. Interleukin-6 and C-reactive protein are associated with depression. Low vitamin D level is associated with both sarcopenia and mood disorders.

Cognitive function is also associated with sarcopenia. In a Korean population, skeletal muscle strength was independently associated with dementia. Skeletal muscle function is independently associated with future cognitive dysfunction in older people, but skeletal muscle mass and strength are not associated with cognitive decline. Sarcopenic individuals may have poorer cognition.

In our study, longer duration of exercise was associated with sarcopenia and improvement in both mental and physical subscales of SF-36. In a study of older Turkish women, 8 weeks of group-based exercise programmes improved all SF-36 subscale scores.

There were limitations to our study. The sample size was relatively small. The cross-sectional nature of the study was unable to assess causality. A specific tool should have been used to evaluate the type of exercise or physical activity.

CONCLUSION

Sarcopenia was associated with worse physical functioning and mental health.

REFERENCES

14. Guigoz Y, Vellas B. The Mini Nutritional Assessment (MNA) for grading the nutritional state of elderly patients: presentation of