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13 ORIGINAL RESEARCH

Prospective Association of Handgrip Strength with Medical Utilization and the Risk of Hospitalization in Korean Adults

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ABSTRACT

Introduction: Age-related loss of skeletal muscle mass (sarcopenia) and/or strength may contribute to an increased risk of chronic disease and disabilities. To diagnose sarcopenia, handgrip strength has been evaluated as a decreased muscular function. In previous studies, reported that decreased handgrip strength was associated with increased risk of chronic disease, mortality, and decreased cognitive function. Nevertheless, the relationship between handgrip strength and health conditions such as medical use or hospitalization is unknown.

Purpose: This study aimed to investigate the prospective association of handgrip strength levels, medical utilization, and hospitalization in the general Korean adults aged ≥45 years in baseline.

Methods: In this study, we selected 10,254 adults aged ≥45 years from Korean Longitudinal Study of Ageing from 2006 to 2018. After excluded participants had missing data, all 9,228 were finally included in the study population. Handgrip strength was divided into quartiles by sex-specific cutoff point. All of the information for days for the use of medical care were obtained from medical receipts. The medical report was examined every 2 years from baseline (2006) to the end of follow-up in 2018. We calculated the utilization of outpatient and hospitalization medical care (days/years). We also generated binary variables (0 or 1) for hospitalization defined as those who were hospitalized at least once a year. To examine the prospective effect of handgrip strength on outpatient use and hospitalization days, we used mixed effects models for repeated measured analysis. Furthermore, cox proportional hazard models were used to predict the risk of hospitalization from handgrip strength levels.

Results: Compared the highest handgrip strength groups, the group of lowest handgrip strength showed a significant higher hazard ratio (HR) of hospitalization in all models (HR: 1.22; 95% CI: 1.11-1.34) after adjusted for covariates. We also found the longitudinal association of handgrip strength

levels and the use of hospitalization and outpatient medical care by using mixed-effects modes with time-dependent interaction. The estimated days of outpatient medical use in lower handgrip strength group (mean, 9.26 days/years; 95% CI: 6.97-11.55) was 3.7-times greater than the higher handgrip strength group (mean, 2.47 days/years; 95% CI: 0.64-4.31).

Discussion: We found that decreased handgrip strength levels contribute to increased risk of hospitalization during 12-years follow-up in the Korean population. Moreover, days of outpatient medical use were higher compared with the higher handgrip strength group. It is intuitive to suggest that having low muscle mass and strength may lead to more functional limitations and more metabolic diseases, which may be caused by geriatric conditions. In fact, loss of skeletal muscle mass has been reported to be related to increased geriatric conditions (i.e., falls, delirium, malnutrition, and disability), contributing to chronic diseases. Although handgrip strength reflects the muscle strength of the whole body, there may be limits to its ability as an indicator of muscular strength. Moreover, we used only handgrip strength as the parameter for sarcopenia and did not use muscle mass. Further studies involving muscle mass may be needed. However, we could infer a cause-and-effect association between handgrip strength and medical health care because of longitudinal study design among middle and older aged of the large general population.

Conclusion: Lower handgrip strength was associated with increased risk of hospitalization and use of medical care in Korea. This study highlights the maintaining of muscular strength may be essential to reduce of risk for hospitalization and medical use by preventing chronic disease.

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