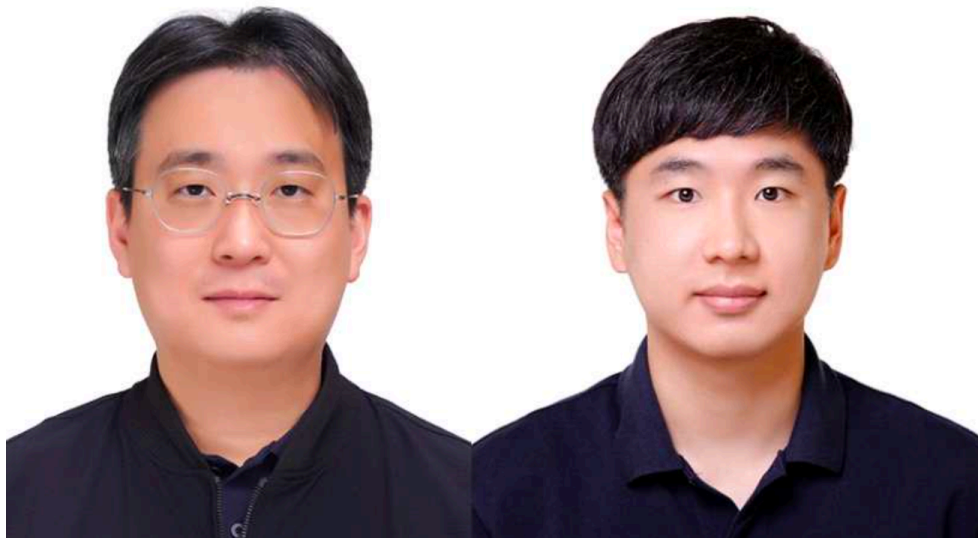


“Muscle loss itself increases mortality” GIST identifies sarcopenia as an independent risk factor for increased cardiovascular disease and mortality

- Professor Chang-Myung Oh's research team in the Department of Biomedical Science and Engineering also found that metabolic diseases and abdominal obesity are more dangerous when combined... Published in the international academic journal <Journal of Cachexia, Sarcopenia and Muscle>



▲ (From left) Professor Chang-Myung Oh and Dr. Donghyun Kim

Research results have revealed the risk of sarcopenia, an abnormal decrease in muscle mass.

The Gwangju Institute of Science and Technology (GIST, President Kichul Lim) announced that the joint research team of Professor Chang-Myung Oh of the Department of Biomedical Science and Engineering and Professor Shinje Moon of the Department of Internal Medicine at Hallym University Kangnam Sacred Heart Hospital found that sarcopenia is an independent risk factor for cardiovascular disease and mortality. In particular, the team confirmed that the risk is greater when metabolic diseases and abdominal obesity are accompanied by sarcopenia.

This study evaluated the impact of sarcopenia on mortality risk according to metabolic health and obesity status, and this was the first study to determine that sarcopenia acts as a mediating variable in the relationship between metabolic disorders and mortality.

Recently, a new concept called 'sarcopenic obesity', which combines the characteristics of sarcopenia and obesity, has been identified as a major risk factor for cardiovascular disease and mortality. However, no research results have been published that clearly clarify the extent to which sarcopenia contributes to the risk of cardiovascular disease and mortality, independently or in combination with other cardiovascular risk factors.

In the past, studies on sarcopenia were conducted on non-obese patient groups, but recently, attention has been paid to the fact that sarcopenia can also occur in

obese patients (sarcopenic obesity). This study revealed that the risk of mortality increases in this group of 'sarcopenic obesity' patients.

The research team examined the relationship between sarcopenia and metabolic syndrome (abdominal obesity, dyslipidemia, glucose metabolism abnormalities, and high blood pressure), which are representative cardiovascular risk factors, on the risk of cardiovascular disease and mortality.

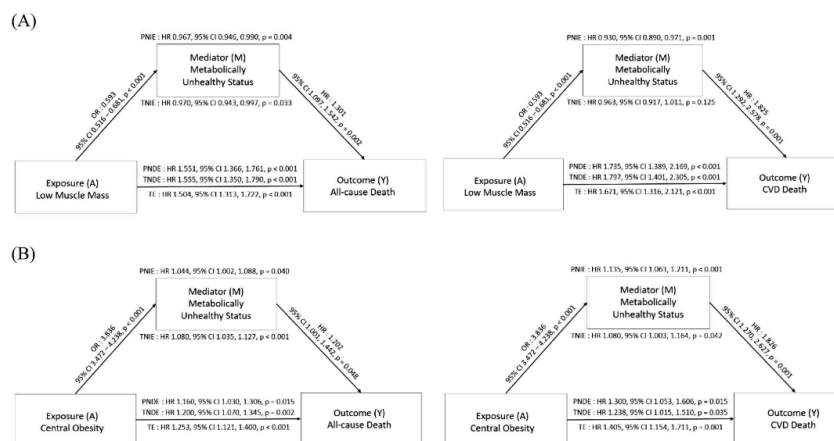
The research team conducted a cross-sectional study* using National Health and Nutrition Examination Survey data (NHANES, 1999-2006 & 2011-2018) to compare the mortality risk of participants grouped according to muscle mass, metabolic health, and obesity status among 16,839 study participants. The direct effect of sarcopenia on mortality was confirmed through mediation effect analysis*.

* cross-sectional analysis: A study that investigates diseases in a certain population group at a specific time or period and examines the relationship between each disease and the characteristics of that population group.

* mediation analysis: Analysis that explains the process by which an independent variable affects a dependent variable through a mediating variable into direct and indirect effects.

To comprehensively evaluate the impact of sarcopenia on mortality and metabolic status, the research team classified study participants into eight groups based on muscle mass, metabolism, and obesity status.

The metabolic syndrome group with low muscle mass had the highest risk for total mortality (HR, 2.00; 95% CI, 1.56-2.56), and the obese group with low muscle mass and no metabolic abnormalities was found to have the highest risk of cardiovascular mortality (HR, 3.18; 95% CI, 1.53-6.65).



▲ Mediation analysis of the effects of sarcopenia and abdominal obesity on total mortality and cardiovascular disease mortality through frailty index

Additionally, they found that sarcopenia was a significant predictor of increased all-cause mortality and cardiovascular mortality, regardless of an individual's obesity or metabolic health status.

Subgroup analysis* showed that sarcopenia increased the risk of total mortality (HR, 1.50; 95% CI, 1.32-1.71) and cardiovascular mortality (HR, 1.54; 95% CI, 1.20-1.97) in individuals without a previous history of cardiovascular disease.

In individuals with diabetes, they found that sarcopenia had a detrimental effect on both total mortality (HR, 1.41; 95% CI, 1.08- 1.84) and cardiovascular mortality (HR, 2.03; 95% CI, 1.32-3.13).

* Subgroup analysis: repeating the study analysis within subgroups of subjects defined by the subgrouping variable

Of particular note is that people with low muscle mass still have a high risk of death even if they have a low rate of metabolic disorders. In response to these results, the research team analyzed that it is important to evaluate and address sarcopenia as an independent risk factor for mortality, regardless of an individual's metabolic disease or obesity status.

Professor Chang-Myung Oh said, "Sarcopenia, an abnormal decrease in muscle mass, is an independent risk factor for cardiovascular disease and mortality. In particular, it was confirmed that there was a higher correlation between metabolic diseases and abdominal obesity. I hope that this will be used as an important clue in future follow-up research on the risk of sarcopenia."

This research, conducted jointly by GIST Professor Chang-Myung Oh's team and Professor Shinje Moon's team at Hallym University College of Medicine, was conducted with support from the National Research Foundation of Korea's Outstanding Young Research Project and the Korea Health Industry Development Institute's Convergence Physician-Scientist Training Project and was published in *Journal of Cachexia, Sarcopenia and Muscle*, an international academic journal, on Monday, December 18, 2023.

