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Response

Prevalence of Obesity and Incidence of Obesity-Related Comorbidities in Koreans Based on National Health Insurance Service Health Checkup Data 2006-2015 (J Obes Metab Syndr 2018;27:46-52)

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The prevalence of obesity has steadily increased in South Korea.[1] Based on the National Health Insurance Service (NHIS) database from 2009 to 2015, the taskforce team of obesity fact sheet of the Korean Society for the Study of Obesity published the 2017 Obesity Fact Sheet. Our study discussed the recent prevalence of obesity and obesity-related comorbidities in *Journal of Obesity & Metabolic Syndrome*.[1]

Our study analyzed associations of obesity-related disease with body mass index (BMI) and waist circumference (WC) according to age group and gender.[1] The prevalence of obesity in men increased from 30 years and decreased from 40 years to 50 years, and the prevalence of obesity in women increased to 70 years and then declined thereafter.[1] In particular, we reported a change in the prevalence of obesity after middle age in males and females. Abdominal obesity measured by WC increased from 20 years to 80 years but decreased after that.[1]

Some important points were raised by the reader about our study, and we would like to respond. First, it was a limitation of our study that muscle mass was not analyzed in the risk assessment of obesity-related diseases. Age, sex, race, and muscle mass can have significant impact on the relation between BMI and body fat. Thus, BMI has some degree of limitation in predicting obesity-related diseases.[2] As humans age, muscle mass decreases and fat amount increases.[3] Decreases of muscle mass and physical activity reduce energy expenditure in older people and lead to fat mass increase and increased risk of abdominal obesity.[4] In addition, increase in fat mass can enhance the secretion of proinflammatory cytokines. Accelerated inflammatory responses can affect the reduction of muscle mass, and vice versa.[5] That is, a decrease in muscle mass and an increase in fat mass are strongly associated with age.[3]

As the reader has pointed out, we reported the risk of disease in elderly patients without data of muscle mass because NHIS data has no information about it. Thus, another study will be needed to assess the risk of disease with obesity comorbidities in older people

with obesity in consideration of muscle mass.[1]

Second, there was no mention in our study about the amounts of exercise and physical activity that are closely related to obesity. The amounts of exercise and physical activity contribute to 25% to 50% of total energy consumption per day and are very important for appropriate weight loss.[6] Active people may have healthier body mass and body composition than inactive people.[6] As the reader pointed out, an obesity prevalence study without information of physical activity has some limitation in predicting disease risk. In our study, the correlation between activity level and obesity was not reported, and further research will be needed.

Third, the association between obesity and cancer was not reported in our study. Again, further research is needed. Several cohort studies have reported the association between obesity and cancer.[7,8] According to collaborative analyses of 57 prospective studies that reported an association between cancer mortality and obesity, the all-cause mortality rate increased by about 30%, and all-cancer mortality increased by 10% for every 5 kg/m^2 increase in BMI compared to the reference BMI of about 22.5–25 kg/m^2.[9] Lee et al.[10] recently reported an association of WC and risk of breast cancer in Korean women. They showed that WC might predict increased breast cancer risk when considering BMI in premenopausal women.[10] Finally, as the reader suggested, receiver operative characteristic curve analysis is needed to confirm the relationships of obesity and comorbidities. We agree with this opinion.

We thank the reader for these very good suggestions. It prompted us to reconsider our findings from a different view point. We hope that more studies shall be undertaken to address these points.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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