Letter: Obesity Fact Sheet in Korea, 2018: Data Focusing on Waist Circumference and Obesity-Related Comorbidities (J Obes Metab Syndr 2019;28:236-45)

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Waist circumference (WC), a surrogate measure of visceral adipose tissue, is positively associated with adverse health outcomes as well as all-cause mortality in most studies with few exceptions.¹ Measurement of WC further refines body mass index (BMI)-associated adverse health risks and should be taken into account when stratifying obesity-related health risks.²

In this issue of the *Journal of Obesity & Metabolic Syndrome*, the Taskforce Team of the Obesity Fact Sheet of the Korean Society for the Study of Obesity reported WC-associated chronic illness and mortality rates, as well as medical costs associated with BMI and WC levels. Chronic illnesses in that report included type 2 diabetes mellitus, hypertension, myocardial infarction, ischemic stroke, and cancers using a national health examination database provided by the Korean National Health Insurance Service from 2009 to 2016.

The results revealed that the incidence rates of chronic diseases such as type 2 diabetes mellitus, hypertension, myocardial infarction, ischemic stroke, and cancers, as well as medical costs increased with WC in 5-cm increments. However, the all-cause mortality rate standardized for age and sex was highest in individuals with the lowest WC level (< 80 cm in men and < 75 cm

in women) followed by those with the highest WC level (≥ 100 cm in men and ≥ 95 cm in women). Therefore, the relationship between WC level and all-cause mortality in the 2018 Obesity Fact Sheet in Korea appears to be U-shaped for both men and women.³

Numerous cohort studies have demonstrated the association between WC and mortality. A systematic review and meta-regression analysis of 18 studies comprising > 680,000 European participants with up to 24 years of follow-up demonstrated that WC values above 95 cm for men and 80 cm for women was associated with increased all-cause death.⁴ Consideration of BMI when investigating the association between WC and mortality may improve the accuracy of visceral obesity-related mortality risk assessment. A pooled analysis of 11 cohort studies with over 650,000 participants suggests a strong positive association of WC in 5-cm increments with total mortality after incorporating BMI in the analysis. The estimated decrease in life expectancy for highest versus lowest WC was ~3 years for men and ~5 years for women. The risk for all-cause mortality per 5-cm increment in WC was similar for both sexes at all BMI levels from 20 to 50 kg/m², but was higher at younger ages.¹ Other studies have also reported

similar findings, with adjustment of BMI strengthening the linearity in the association between WC and mortality.⁵⁻⁷

The 2018 Obesity Fact Sheet in Korea reported a U-shaped relationship between WC levels and age- and sex-standardized mortality rate,³ which may be due to insufficient adjustment for confounding factors including BMI. Therefore, individuals in the lowest WC level may be more likely to be current smokers, have comorbidities, poor health status, and/or suboptimal nutritional status compared to those in higher WC levels. In other words, ill people who have lost weight and are at high risk of dying⁸ may be included in the lowest WC levels. Although the authors stated the study limitations with respect to insufficient adjustment for confounding factors, this underlying explanation concerning the U-shaped relationship between WC and mortality should be mentioned.

Nevertheless, these national data-based findings emphasize the utility and importance of simple measurement of both BMI and WC with respect to providing opportunities to assess obesity- and/or abdominal obesity-related health outcomes and medical expenses.

CONFLICTS OF INTEREST

The author declares no conflict of interest.

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