An intermediate body mass index (23 to 30 kg/m^2) was associated with the most favorable mortality in older women

Dolan CM, Kraemer H, Browner W, Ensrud K, Kelsey JL. **Associations between body composition, anthropometry, and mortality in women aged 65 years and older.** Am J Public Health. 2007;97:913-8.

Clinical impact ratings: GIM/FP/GP ★★★★★☆☆ Geriatrics ★★★★★☆☆

QUESTION

In women ≥ 65 years of age, what is the association between measures of body composition and mortality?

METHODS

Design: Prospective cohort study with mean follow-up of 8 years.

Setting: Community-based study in Baltimore, Maryland; Minneapolis, Minnesota; Portland, Oregon; and the Monongahela Valley area, Pennsylvania, USA.

Participants: 8029 women ≥ 65 years of age (median 72 y, 98% Caucasian) who were participating in a study about osteoporotic fractures and had complete bioelectric impedance measurements. Women with bilateral hip replacement or who were unable to walk were excluded.

Risk factors: Body mass index (BMI), waist girth, lean mass (measured by bioelectric impedance analysis), fat mass (total body weight minus lean mass), and percentage body fat (fat mass divided by total body weight).

Outcomes: All-cause mortality.

MAIN RESULTS

For all 5 measures, a U-shaped pattern was observed for the association between body composition and mortality, with the highest mortality rates in the lowest and highest quintiles. For body mass index, fat mass, and percentage body fat, women in the middle 2 or 3 quintiles had lower mortality rates than those in the lowest quintile; rates in the highest quintile were not increased (Table). For lean mass and waist girth, mortality rates in the 4 upper quintiles did not differ from those in the lowest quintile (Table).

CONCLUSIONS

In women ≥ 65 years of age, those with the highest values for measures of body composition did not have increased risk for mortality compared with women with the lowest values. Women in the intermediate ranges (e.g., BMI 23.4 to 29.8 kg/m^2) had reduced mortality compared with the leanest women.

Source of funding: Bone and Musculoskeletal Diseases Training Grant, National Institutes of Health.

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Rate ratios (95% CI) for mortality by quintile of body composition measures in relation to the lowest quintile in women ≥ 65 years of age at mean 8 years*

Measures	1st quintile (value)	2nd quintile	3rd quintile	4th quintile	5th quintile
Body mass index	1.0 (22.4 kg/m^2)	0.80 (0.65 to 0.96)	0.70 (0.57 to 0.87)	0.72 (0.58 to 0.89)	0.89 (0.72 to 1.1)
Fat mass	1.0 (≤ 19.5 kg)	0.80 (0.66 to 0.98)	0.67 (0.54 to 0.83)	0.72 (0.58 to 0.89)	0.93 (0.75 to 1.2)
Percentage body fat	1.0 (≤ 34.3%)	0.88 (0.73 to 1.1)	0.77 (0.63 to 0.94)	0.65 (0.53 to 0.82)	0.86 (0.70 to 1.1)
Lean mass	1.0 (≤ 36.1 kg)	0.88 (0.72 to 1.1)	0.83 (0.67 to 1.1)	0.88 (0.70 to 1.1)	1.2 (0.92 to 1.5)
Waist girth	1.0 (≤ 74.1 cm)	0.87 (0.69 to 1.1)	0.93 (0.75 to 1.2)	1.1 (0.88 to 1.4)	1.2 (0.94 to 1.5)

*CI defined in Glossary. Rate ratios were adjusted for age, smoking, self-reported health, grip strength, nonthiazide diuretic use, and femoral neck bone mineral density.

COMMENTARY

Similar to several other studies, Dolan and colleagues, using carefully collected longitudinal data from the Study of Osteoporotic Fractures (SOF), reported a U-shaped relation between BMI (and other measures of body composition) and risk for death (i.e., risk for dying was greatest among the thinnest women and the most obese women). This relation persisted regardless of the measure of body composition analyzed and despite adjustment for confounders, including hypertension and diabetes, and the exclusion of smokers or women who died within 2 years of enrollment. These findings differ from those of other recent, very large studies that showed linear associations between BMI or waist circumference, an indicator of central adiposity, and mortality (1, 2). These study samples were different (American men and Chinese women 40 to 70 y of age, respectively) from those of the Dolan study. Because of the conflicting reports, it is not possible to conclude whether the true, unconfounded, and unbiased relation between body weight and all-cause mortality is linear or U-shaped. However, it is useful to note that, across studies, the relation between obesity and mortality is weaker among the elderly (e.g., SOF participants whose median age was 72 y) and the relation of overweight to mortality is weaker than the relation of obesity to mortality.

What is undisputed, however, is that the prevalence of obesity in the United States has increased dramatically over the past 40 years: Approximately 1 of every 3 American adults is now obese (defined as BMI ≥ 30). Because obesity has been associated in many studies with increased risk for dyslipidemia, hypertension, diabetes, cardiovascular disease, and some types of cancer, and in a recent meta-analysis of 26 studies, with a 22% increased risk for all-cause mortality (3), this secular trend is a cause of great public health concern. For clinicians, focusing efforts on patients at greatest risk for weight-related morbidity and mortality remains of paramount importance. Regardless of whether the U-shaped relation is the consequence of residual confounding from preexisting illness or such factors as smoking (and hence truly linear) or accurately represents an unconfounded relation (perhaps secondary to lower energy reserves placing the thinnest persons at increased risk at times of great biological stress), our clinical advice to eat a prudent diet, remain physically active, and adopt a healthy lifestyle should remain the same.

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