Excess Weight Associated with Worsening Disability Among White Medicare Beneficiaries; Association with Mortality Risk Limited to Highest BMI Level

Wee C, Huskey K, Ngo L, et al. Obesity, race, and risk for death or functional decline among Medicare beneficiaries: a cohort study. Ann Intern Med 2011;154:645–55.

Study Overview

Objective. To determine whether weight status affects mortality and disability among Medicare beneficiaries.

Design. Longitudinal cohort using data from the Medicare Current Beneficiary Survey (MCBS) from 1994 to 2000, linked to Medicare enrollment files, allowing for determination of date of death through 22 Apr 2008. The MCBS follows subjects for 4 years but collects relevant data for only 3 years and data on functional status for 2 years. Subjects are interviewed 3 times annually. Each year, the MCBS retires one-third of its cohort and adds 6000 new subjects. The response rate is 85% for enrollment and 90% for follow-up years.

Setting and participants. 20,975 subjects who were community-dwelling and were ≥ 65 years of age. For the mortality analyses, those who died in the first year of follow-up (945 total) were excluded because of concerns that their weight in the final year of life might reflect their illness preceding death rather than a true baseline weight. HIV/AIDS patients were also excluded (< 15 subjects total). The disability analyses excluded these same subjects as well as subjects with severe disability at baseline (unreported number of subjects) and subjects who died between years 1 and 2 (609 excluded for ADL and 472 for IADL analyses; see below).

Main outcome measures. Time to death; new or worsening disability for activities of daily living (ADLs—bathing or showering, dressing, eating, getting in and out of chairs, walking, toileting) and instrumental activities of daily living (IADLs—telephone use, light housework, heavy housework, making meals, shopping, managing money).

Main results. At baseline, mean age was 74.7 years. 57% of subjects were women, 84% white, 8% African American, 6% Hispanic, and 2% other race. Mortality was 8% at 2 years, 21% at 5 years, and 48% during the course of follow-up (up to 14 years). Disabilities in ADLs were 27% and IADLs 43% at baseline; 17% of those without severe disability at baseline developed a new or worsening ADL disability over 2 years of follow-up and 26% developed a new or worsening IADL disability. At baseline, 3% of subjects were underweight (BMI < 18.5 kg/m^2), 41% normal weight (18.5–24.9 kg/m^2), 37% overweight (25–29.9 kg/m^2), and 18% obese (≥ 30 kg/m^2). In results adjusted for age, smoking status, and non–obesity-related comorbid conditions, overweight subjects had a lower mortality than normal weight (using BMI of 22.0–24.9 kg/m^2 as reference) for both men and women. Mortality was higher for BMI ≤ 21.9 kg/m^2 and for ≥ 35.0 kg/m^2. For those with BMI ≥ 35.0 kg/m^2, the hazard ratio for morality was 1.49 (95% confidence interval [CI], 1.20–1.85) for men and 1.21 (95% CI, 1.06–1.39) for women. New or progression of ADLs or IADLs was

higher for all weight categories ≥ 27.5 kg/m^2 and for the underweight group (again compared to a reference of 22.0–24.9 kg/m^2). Interactions between BMI and race were not significant; however, stratified analyses showed no significant relationships for African-American men or women in the mortality and disability analyses except for a test for trend showing a higher rate of new or worsening ADL disability with higher BMI for African-American women.

Conclusion. BMI ≥ 35.0 kg/m^2 and underweight is associated with a higher mortality among whites with no significant association among blacks. BMI ≥ 27.5 kg/m^2 and underweight are associated with incident disability among whites as well.

Commentary

The effect of obesity among the elderly has been controversial. Studies have found conflicting results for the potential mortality risk associated with obesity in this population, with some showing a clear relationship [1–3] and others showing a limited or nonexistent relationship [4,5]. Disparities by race have been noted as well, with typically stronger mortality links to obesity among whites compared with blacks [1,6]. These data, along with evidence for possible harm induced by weight loss in the elderly from possible acceleration of muscle loss and loss of bone mineral density [7,8], have called into question whether it is wise to recommend weight loss in this population.

This study by Wee et al contributes important data to this area of uncertainty. Obesity was associated with mortality in this analysis of data from the Medicare Current Beneficiary Survey but only at BMIs ≥ 35.0 kg/m^2 as well as underweight. Overweight categories actually were associated with a lower mortality rate than the reference category (22.0–24.9 kg/m^2). These relationships were present for both men and women but were only significant for whites. In addition to assessing mortality as an outcome, the authors importantly also evaluated the relationship between BMI categories and incident short-term disability (over 2 years), measured as the worsening or development of a disability in ADLs or IADLs. They found a clearly higher incidence of disability for both underweight subjects and those with BMIs ≥ 27.5 kg/m^2 (again, compared with the same reference group). Most of the relationships for blacks for the disability outcomes remained nonsignificant.

These findings on disability are complementary to recent evidence from a randomized clinical trial by Villareal and colleagues [9]. This study, conducted among sedentary, frail, obese men and women ≥ 65 years of age, found beneficial effects from both a dietary weight loss program and supervised exercise training in improving physical function, body fat, fitness, strength, balance, and gait. Combining a weight management program with exercise training was even more beneficial than either intervention alone.

The primary strengths of the Wee et al study are the large overall sample size with > 20,000 subjects that were nationally representative of the non-institutionalized US Medicare population. The study was well-conducted with results that are robust to numerous sensitivity analyses. Limitations included the availability of only self-reported data on all measures, including height and weight, which can be systematically inaccurate when compared to measured values. Also, disability assessments were available for only 2 years. Unmeasured confounders could easily account for the relationship between weight and short-term disability, even though the authors did control for common clinical conditions that could affect weight and disability. Datasets that could measure the relationship between weight at baseline and the development of disability over a long term would be more effective in clearly establishing these relationships. This limitation was not present for the mortality analyses because of the availability of mortality data for up to 14 years.

The relatively small sample size among blacks was also a concern. In most of the analyses, the actual point estimates were similar for whites and blacks, and there were no significant interactions by race found for either the mortality or disability outcomes. Yet, confidence intervals for blacks were large, suggesting that perhaps similar effects of obesity would be found with a large enough sample size. The authors repeatedly emphasize the lack of a significant interaction by race, suggesting that the true effect of weight on mortality and disability is likely similar among blacks and whites. Unfortunately, without a large enough sample size to demonstrate this finding clearly, this is speculative. Future research must strive to use a large prospective sample of elderly black subjects to answer the question of disparities by race with any degree of certainty.

Applications for Clinical Practice

Among whites only, BMI ≥ 35.0 kg/m^2 was associated with higher mortality. Overweight was actually associated with a lower mortality than normal weight. Disability was higher among all BMI categories ≥ 27.5 kg/m^2 compared with normal weight, but again, this relationship was only significant for whites. Clinicians should counsel elderly patients about the benefit of a healthy weight for disability outcomes but have less evidence of an elevated mortality risk with higher BMI except in the highest BMI categories.

—Review by Jason P. Block, MD, MPH

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