

Relationships Between Adiposity Indices and Mortality in a Large Multiethnic Postmenopausal Cohort: Findings from the Women's Health Initiative

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Background: A body shape index (ABSI) and body adiposity index (BAI) have emerged as new composite measures of adiposity to describe risk estimates for mortality beyond body mass index (BMI), with an emphasis on integration of body fat distribution with risk estimates. It is unclear how these different anthropometric approaches demonstrate clinical utility in relation to mortality risk estimation for different racial/ethnic groups.

Objective: To investigate racial/ethnic differences in the relationships between ABSI, BAI, BMI, and mortality in 152,090 postmenopausal women.

Methods: Using data from previous analyses of BMI and mortality (Chen) and ABSI, BAI, and mortality (Thomson), a prospective cohort analysis was conducted to ascertain the independent relationships between adiposity indices and mortality in women of three racial/ethnic groups enrolled in the Women's Health Initiative. ABSI (waist circumference (cm) / [BMI^{2/3} x height (cm)^{1/2}]), BAI (hip circumference (cm) / [height (m)^{1.5} - 18]), and BMI (underweight <18.5 kg/m²; normal weight 18.5-24.9 kg/m²; overweight 25-29.9 kg/m²; obese class I 30-34.9 kg/m²; obese class II 35-39.9 kg/m²; and obese class III ≥40 kg/m²) were evaluated in relation to mortality risk using adjusted Cox proportional hazards regression models. Likelihood ratio tests were used to test for interaction between race/ethnicity category and ABSI, BAI, or BMI on mortality.

Results: Mean BAI was 33.5 ± 6.2 in non-Hispanic whites (NHW), 35.9 ± 6.3 in Hispanics, and 31.2 ± 6.7 in blacks. A significant interaction was shown between race/ethnicity and BAI ($p_{\text{interaction}} < 0.001$); regression models suggested the relationship between BAI and mortality was U-shaped for Hispanic and NHW women, with BAI quintile 3 associated with a 47% (HR 0.53; 95% CI, 0.36–0.78) and 7% (HR 0.93; 95% CI, 0.89–0.97) lower mortality risk compared to quintile 1, respectively. No difference in risk by BAI quintiles was observed for blacks. Mean ABSI was 0.74 ± 0.06 in NHW, 0.74 ± 0.06 in Hispanics, and 0.73 ± 0.06 in blacks. There was no significant interaction between race/ethnicity and ABSI and mortality ($p_{\text{interaction}} = 0.61$). Mean BMI was 27.6 ± 5.7 kg/m² in NHW, 29.0 ± 5.8 kg/m² in Hispanics, and 31.2 ± 6.7 kg/m² in blacks. When assessing BMI according to WHO risk categories, women classified as underweight and obese (I-III) were at increased risk of mortality across all racial/ethnic groups. The associations were strongest for Hispanics with BMI <18.5 kg/m² (HR, 4.17; 95% CI, 1.68–10.3), followed by BMI obese III (HR, 2.26; 95% CI, 1.51–3.38), BMI obese II (HR, 1.89; 95% CI, 1.33–2.69), and BMI obese I (HR, 1.43; 95% CI, 1.08–1.90).

Conclusions: BAI and BMI are associated with higher mortality risk, particularly in Hispanic women.

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