

## Study: obesity improves short-term survival in sepsis



In a large cohort study of 55,038 adults hospitalised with sepsis, short-term mortality (death or hospice) was lower in overweight and obese patients compared with those with normal body mass indices (both unadjusted and adjusted analyses). These findings highlight the need for well-conducted prospective clinical trials that assess obesity's impact on survival in sepsis.

Previous observational studies suggest obesity is associated with sepsis survival, but these studies are small, fail to adjust for key confounders, measure body mass index (BMI) at inconsistent time points, and/or use administrative data to define sepsis. In contrast, the current study used detailed clinical, laboratory, and physiologic data to strengthen the finding that obesity is independently associated with improved short-term survival in adults with sepsis.

This study is the largest to date assessing the association between BMI and sepsis mortality. The large cohort included sepsis patients admitted to over 130 U.S. hospitals that were well distributed by region. Thus, the findings are unlikely to be biased by regional hospital practices. In addition, study authors used BMI data on or before the day of sepsis onset (i.e., dry body weight) to minimise potential weight gain due to fluid resuscitation or potential weight loss following the catabolic effects of sepsis.

The authors identified the subset of sepsis cases with BMI, weight, or height data on or before the day of sepsis diagnosis (defined as the index blood culture draw). For those without direct BMI measurements, the authors calculated BMI as weight in kilograms divided by height in metres squared ( $\text{kg}/\text{m}^2$ ). They categorised BMI as follows: underweight (body mass index  $< 18.5 \text{ kg}/\text{m}^2$ ), normal weight (body mass index =  $18.5\text{--}24.9 \text{ kg}/\text{m}^2$ ), overweight (body mass index =  $25.0\text{--}29.9 \text{ kg}/\text{m}^2$ ), obese class I (body mass index =  $30.0\text{--}34.9 \text{ kg}/\text{m}^2$ ), obese class II (body mass index =  $35.0\text{--}39.9 \text{ kg}/\text{m}^2$ ), and obese class III (body mass index  $\geq 40 \text{ kg}/\text{m}^2$ ).

Multivariate logistic regression with generalised estimating equations was used to estimate the effect of BMI category on short-term mortality (in-hospital death or discharge to hospice) adjusting for patient, infection, and hospital-level factors.

Of 55,038 adults with sepsis and assessable BMI measurements: 6% were underweight, 33% had normal weight, 28% were overweight, and 33% were obese. Crude mortality was inversely proportional to BMI category: underweight (31%), normal weight (24%), overweight (19%), obese class I (16%), obese class II (16%), and obese class III (14%). Compared with normal weight, the adjusted odds ratio (95% CI) of mortality was 1.62 (1.50–1.74) for underweight, 0.73 (0.70–0.77) for overweight, 0.61 (0.57–0.66) for obese class I, 0.61 (0.55–0.67) for obese class II, and 0.65 (0.59–0.71) for obese class III. Results were consistent in sensitivity analyses.

Although this study found lower mortality rates in patients with higher BMIs, the authors caution against labelling this as “the obesity paradox.” BMI is a poor proxy for adiposity and may not accurately represent fat content, the proportions of muscle and fat, or overall body composition, the authors explain.

Further, they say future prospective studies that aim to assess the effect of BMI on sepsis outcome will need to: 1) uniformly record weight and height measurements; 2) quantify body composition, smoking consumption, and weight loss; 3) adjust for potential confounders; 4) report the effects of interventions used in sepsis; and 5) assess long-term mortality.

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