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Title: Obesity and outcomes in patients hospitalized for pneumonia

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Body: Background: Obesity is a risk factor for acquiring pneumonia, but studies also suggest it is associated with better pneumonia-related outcomes. We examined the impact of obesity on short-term mortality in patients hospitalized with pneumonia. Methods: For 2-years clinical data were prospectively collected on all consecutive adults admitted with pneumonia to 6 hospitals in Edmonton, Alberta, Canada. We identified 907 patients who also had body mass index (BMI, kg/m2) collected. Patients were categorized as underweight (BMI<18.5), normal (18.5 to <25), overweight (25 to <30) and obese (>30). Results: Overall, 65% were >65 years, 52% were female and 15% reported recent weight loss. 84 (9%) were underweight, 358 (39%) normal, 228 (25%) overweight, and 237 (26%) obese. Two-thirds had severe pneumonia (63% PSI Class IV/V) and 79 (9%) patients died. In-hospital mortality was greatest among the underweight (12 [14%]) vs normal (36 [10%]) vs overweight (21 [9%]) vs obese (10 [4%], p<0.001 for trend). Compared with normal weight, obese patients had lower rates of in-hospital mortality (4% vs 10%, unadjusted odds ratio (OR) 0.39, 95%CI 0.19-0.81) that remained significant in multivariable analyses adjusted for age, sex, comorbidities, and clinical-radiographic severity of pneumonia (adjusted OR 0.44, 95%CI 0.21-0.94, p=0.035). However, compared with normal weight, neither underweight (adjusted p=0.47) nor overweight (adjusted p=0.64) were associated with mortality. Conclusion: In patients hospitalized with pneumonia, obesity was independently associated with lower short-term mortality, while neither underweight nor overweight were. This suggests a protective influence for BMIs>30 kg/m2 that requires better mechanistic understanding.