Impact of extreme obesity on long-term outcomes following percutaneous coronary intervention

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Topic(s): Obesity

Citation:
Background:
Obesity is a growing health concern worldwide, particularly in developed countries where there has been an unprecedented rise in the proportion of overweight and obese individuals in the population. Previous studies have reported a protective effect of obesity compared to normal BMI in patients undergoing percutaneous coronary intervention (PCI). However, it is unclear whether this effect extends to the extremely obese over long-term follow-up.

Objective:
To determine whether an obesity paradox persists in contemporary PCI practice over long-term follow-up, and in particular to further evaluate the association between extreme obesity and long-term clinical outcomes after PCI.

Method:
We prospectively collected data on 25,645 patients undergoing PCI between 1 January 2005 and 30 June 2017 who were enrolled in the statewide multi-centre Melbourne Interventional Group Registry. This registry collects data on all patients undergoing PCI at 6 academic tertiary hospitals. Patients were stratified by World Health Organization-defined BMI categories. Long-term mortality data was obtained by linkage to the National Death Index (NDI), a database that contains records of all deaths occurring in Australia. The primary endpoint was NDI-linked mortality. Median length of follow-up was 4.4 years (IQR 2.0-7.6 years).

Results:
Of the study cohort, 24.6% had normal BMI (18.5 – 24.9 kg/m²), 0.9% were underweight (BMI <18.5 kg/m²) and 3.3% were extremely obese (BMI ≥40 kg/m²). As BMI increased, mean age decreased while the prevalence of diabetes increased (p<0.001). The proportion of females at both extremes of BMI. Procedural characteristics were similar across the groups although there was more radial access and less femoral access used with increasing BMI (p<0.001). In terms of secondary prevention therapy, underweight patients were significantly less likely to receive a beta blocker, ACE inhibitor and statins, compared to the other BMI groups. In-hospital, 30-day and long-term mortality were all highest for underweight patients (37.7%) and lowest for the moderately obese patients (BMI 35-40 kg/m²) (12.2%). After adjustment for age, comorbidities and presentation with cardiogenic shock, a U-shaped association between the different BMI categories and adjusted hazard ratio for long-term mortality was observed (Figure 1).

Conclusion:
An obesity paradox is still apparent in contemporary practice with elevated BMI up to 35 kg/m² associated with reduced long-term mortality after PCI. However, this protective effect appears not to extend to patients with extreme obesity. Factors behind this phenomenon are likely multifactorial and require further mechanistic and epidemiological studies.
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