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Impact of BMI on clinical outcomes in all-comers patients with coronary artery disease undergoing PCI: insights from the Global Leaders study

P. Chichareon¹, R. Modolo¹, N. Kogame¹, K. Takahashi¹, T. Moccetti², E. Subkovas³, S. Talwar⁴, C. Hamm⁵, G. Steg⁶, P. Juni⁷, M. Valgimigli⁸, P. Vranckx⁹, S. Windecker⁸, Y. Onuma¹⁰, P.W. Serruys¹¹

¹Amsterdam University Medical Center, Amsterdam, Netherlands (The); ²Cardiocentro Ticino, Lugano, Switzerland; ³Glan Clwyd Hospital, Denbighshire, United Kingdom; ⁴Royal Bournemouth Hospital, Bournemouth, United Kingdom; ⁵Kerckhoff Heart and Thorax Center, Bad Nauheim, Germany; ⁶Hospital Bichat-Claude Bernard, Paris, France; ⁷St. Michael's Hospital, Toronto, Canada; ⁸Preventive Cardiology & Sports Medicine, Inselspital Bern, Bern, Switzerland; ⁹Virga Jesse Hospital, Hasselt, Belgium; ¹⁰Erasmus Medical Centre, Rotterdam, Netherlands (The); ¹¹Imperial College London, London, United Kingdom

Background: It is uncertain if the obesity paradox still exists in contemporary PCI practice.

Purposes: We aimed to assess an association between baseline BMI and clinical outcomes at 2 years after PCI and to determine if the outcomes between two antiplatelet strategies depend on baseline BMI.

Methods: Global Leaders study compared 23-month ticagrelor monotherapy after 1 month of dual antiplatelet therapy (experimental strategy) with 12-month aspirin monotherapy after 12 months of conventional DAPT (reference strategy) in patients undergoing PCI with biolimus-A9 eluting stent. Primary outcome of current study was 2-year all-cause mortality after PCI. Secondary outcomes were net adverse clinical event (NACE) and individual components of the composite endpoint.

Association between baseline BMI and outcomes were determined in the Cox model. Non-linearity was assessed using restrict cubic spline function. Patients were categorized according to WHO BMI categories; underweight (BMI <18.5), healthy weight (BMI 18.5–24.9), pre-obese state (BMI 25–29.9) and obesity (BMI ≥30). Interaction between BMI categories and antiplatelet strategies were assessed.

Results: BMI was available in 15,966 out of 15,968 patients with a median of 27.7 kg/m² (IQR 25.0–30.7). Baseline BMI had a reverse J-shaped association with 2-year all-cause mortality. 3901 patients (24.4%) were in the group of healthy weight, 79 patients (0.5%) were under-weight, 7220 patients (45.2%) were pre-obese and 4766 patients (29.8%) were obese.

Due to small number of underweight patients, outcomes after PCI were compared among three groups; healthy weight, overweight, and obesity.

Pre-obese and obese patients had lower risk of 2-year all-cause mortality than healthy-weight patients (HR pre-obesity vs. healthy-weight 0.71, 95% CI 0.58–0.88, HR obesity vs. healthy-weight 0.69, 95% CI 0.54–0.87). The risk of 2-year NACE was similar among three groups (healthy weight vs. pre-obesity; HR 1.04, 95% CI 0.94–1.16, healthy weight vs. obesity; HR 1.04, 95% CI 0.93–1.16). No significant difference in risk of any stroke, any MI, and BARC3 or 5 bleeding was found among three groups. Pre-obese patients had higher risk of revascularization than patients with healthy weight (HR 1.19, 95% CI 1.04–1.35). The risk of revascularization in obese patients was numerically higher than healthy-weight patients (HR 1.14, 95% CI 0.99–1.31).

For BARC 3 or 5 bleeding at 2 years, ticagrelor monotherapy was more favorable in obese patients (HR reference/experimental 1.63, 95% CI 1.06–2.52) while conventional DAPT strategy was more favorable in pre-obese patients (HR experimental/reference 0.76, 95% CI 0.55–1.05) (P interaction 0.02). No interaction between treatment strategy, BMI, and other outcomes was seen.

Conclusions: An obesity paradox, an association between elevated BMI and lower mortality, is still evident in this large PCI population. Effect of two antiplatelet strategies on bleeding may depend on baseline BMI.

