INDEXING BY BODY SURFACE AREA FAILS TO CORRECT FOR BODY SIZE IN PATIENTS WITH AORTIC VALVE STENOSIS

ACC Poster Contributions
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Background: Grading of the severity of aortic valve stenosis is achieved by the echocardiographic assessment of aortic valve area (AVA) with, for example, severe stenosis defined by an AVA<1.0 cm². Since people of different body size require different sizes of valve area, an indexed cut-off value (<0.6cm²/m² of body surface area) is frequently preferred. This approach assumes a linear relationship between valve area and body surface area, prompting us to hypothesize that indexing by body surface area fails to correct for differences in body size in patients with aortic valve stenosis.

Methods: Echocardiographic and anthropometric data from 716 consecutive patients with an aortic valve area of <1.2cm² and normal left ventricular function were analysed.

Results: Mean height was 167±9cm, body weight 78±15kg, body mass index 28±5, and body surface area 1.9±0.2m². Valve area was significantly correlated with body surface area (Pearson’s coefficient r=0.257, p<0.001). Adjusting for body surface area, which should ideally eliminate any correlation (r=0.00), resulted in a similar but negative association (r=-0.212, p<0.001) suggesting overcorrection. Regression analysis revealed that an allometric (non-linear) relationship (AVA=BSA 0.587 + 0.528) best corrected for this parameter (r=0.03). Similar results were obtained when adjusting for body mass index (correlation between AVA and BMI: r=0.156, p<0.001; adjusted for BMI: r=-0.424, p<0.001; allometric model: AVA=BMI 0.264 + 0.319).

Conclusion: In patients with aortic valve stenosis linear adjustment of valve area by body surface area appears inappropriate. Non-linear models may be more suitable.