Low Stroke Volume Index is an Independent Predictor of Mortality among Patients with Low Gradient Severe Aortic Stenosis and Preserved Left Ventricle Function

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Background:
The aim of the current study was to evaluate whether assessment of stroke volume index (SVI) can be used to improve risk stratification among patients with low-gradient severe aortic stenosis and preserved ejection fraction.

Methods:
Study population included patients who underwent baseline echocardiography and were followed-up at Sheba Medical Center (years 2004-2011). We identified 440 patients (mean age 76±14 years; 42% males) with aortic valve area ≤1.00 cm^2, mean gradient<40 mm Hg , a normal ejection fraction (EF≥50%) and no other significant valvular disease. Multivariate Cox proportional hazards regression modeling was used to evaluate the effect of SVI (assessed both as a continuous measure and dichotomized at 35 ml/m^2) on the risk of death among the study population. Adjustment to age, gender and time dependent surgical intervention was done as well.

Results:
Mean SVI among study patients was 39±7 mL (range 20-59 mL). After adjustment to age and gender, multivariate analysis showed that for each 5 ml/m^2reduction in SVI, there was a significant 19% increase in adjusted mortality risk (hazard ratio = 1.19 [95% CI 1.04-1.34] p=0.004). When dichotomized at <35 ml/m^2, a low SVI was shown to be associated with a significant 46% (p=0.03) increased risk of death during follow-up. Consistently, Kaplan-Meier analysis showed that the cumulative probability of survival during 4 years of follow-up was significantly lower among patients with SVI<35 ml/m^2 (Figure).

Conclusion:
Our findings suggest that reduced SVI is an independent predictor of long-term mortality among patients with low gradient severe aortic stenosis and preserved ejection fraction.