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CAN LEFT VENTRICULAR AFTERLOAD INFLUENCE RV FUNCTION IN AORTIC STENOSIS?

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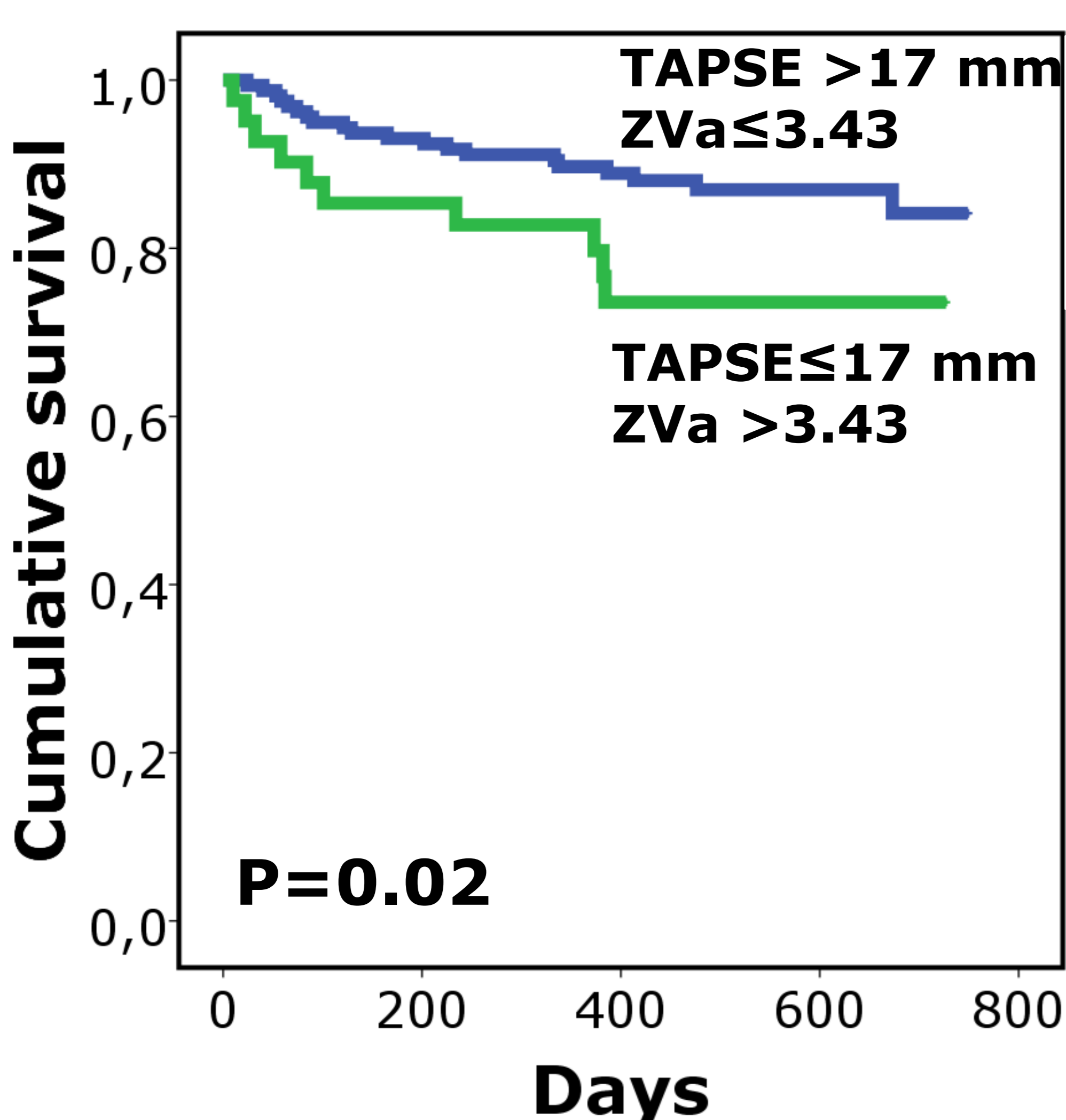
Introduction: alteration in left ventricular (LV) afterload may influence RV function, as observed in patients with arterial hypertension. A ventricular interdependency has been advocated as the main reason for these findings. Aim of the present study is to verify if a progressive increase in ventriculo-arterial impedance (ZV_a), may influence RV function in patients with aortic stenosis (AS).

Methods: 218 patients (mean age: 79.9 ± 8.6 years, males: 54%) with severe AS (aortic surface $< 1 \text{ cm}^2$ or $< 0.6 \text{ cm}^2/\text{m}^2$) underwent standard echocardiography to characterize aortic valve gradients, biventricular function and ZV_a .

Results: according to ZV_a quartiles the population was divided in four groups: Group A ($ZV_a \leq 3.43 \text{ mmHg/ml/m}^2$), Group B ($3.43 < ZV_a \leq 4.1 \text{ mmHg/ml/m}^2$), Group C ($4.1 < ZV_a \leq 5.1 \text{ mmHg/ml/m}^2$), Group D ($ZV_a > 5.1 \text{ mmHg/ml/m}^2$). Progressive ZV_a increase was associated with a significant reduction in LV performance, as indicated by the progressive reduction in LV ejection fraction (LVEF) ($p=0.02$), indexed stroke volume (SVi) ($p < 0.0001$), mean mitral annulus systolic velocity at tissue Doppler imaging (s') ($p=0.05$), global longitudinal strain (GLS) (< 0.0001) and by a concomitant significant reduction in RV function, as indicated by TAPSE values ($p=0.001$) (Table 1).

Table 1	Group A	Group B	Group C	Group D	ANOVA P
LVEF (%)	57.9 ± 10.8	58.6 ± 9.5	56.8 ± 12.9	50.64 ± 14.5	0.02
SVi (ml/m ²)	49.6 ± 14.0	47.3 ± 7.1	40.9 ± 5.9	31.6 ± 6.8	< 0.0001
s' (cm/sec)	6.2 ± 1.2	6.5 ± 1.6	6.21 ± 1.9	5.6 ± 1.5	0.05
LV GLS (%)	-14.4 ± 13.3	-13.3 ± 3.4	-12.5 ± 3.5	-10.6 ± 3.2	< 0.0001
TAPSE	21.4 ± 4.0	20.4 ± 4.3	20.9 ± 3.4	18.1 ± 4.8	0.001

Figure 1



At Kaplan-Meier analysis, the concomitant presence of a reduced TAPSE ($\leq 17 \text{ mm}$) and mild increase in ZV_a ($> 3.43 \text{ mmHg/ml/m}^2$) was associated to a significant increase in mortality (Log-Rank test, $p=0.02$) (Figure 1)

Conclusions: In patients with severe AS, increased ZV_a has a negative impact on LV and RV function. The concomitant presence of reduced RV function and increased ZV_a portends a poor prognosis. Further studies on larger samples are needed to clarify the effective role of increased post-chamber and biventricular interdependence on RV function in AS.