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Global longitudinal strain in chronic asymptomatic aortic regurgitation: a meta-analysis

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BACKGROUND Previous studies have shown that left ventricle global longitudinal strain (GLS) assessed with 2D-speckle tracking echocardiography, is an independent predictor of outcome in asymptomatic moderate to severe chronic aortic regurgitation (AR) patients.

OBJECTIVES: To assess GLS impact on mortality and need for aortic valve replacement (AVR) or symptom development in chronic asymptomatic AR patients and preserved left ventricular ejection fraction (LVEF).

METHODS A literature search was performed according with these key terms "aortic regurgitation" and "longitudinal strain." The primary endpoint was all-cause mortality. Secondary end-points were: a composite of all-cause mortality, need for AVR or symptom development; and only AVR plus symptom development. Data was pooled using random-effects meta-analysis models. Pooled Hazard Ratio (HR) was performed using its log transformation and inverse variances as weights were then calculated for each study .

RESULTS Six studies were included, with a total of 1,571 asymptomatic patients with at least moderate AR and preserved LVEF. There were 996 events (death, AVR, symptom development) reported during follow-up. Pooled adjusted mortality HR tended to be higher for patients with worse GLS (1.14 [0.96–1.35], P = 0.13, I2 51%). GLS performed better in predicting AVR or symptom development (mean difference -0.72 [-1.29, -0.15], P = 0.01, I2 88%), with an estimated HR of 1.36 ([1.01–1.84], P = 0.04, I2 65%).

CONCLUSIONS In asymptomatic chronic moderate to severe AR patients, impaired GLS was associated with adverse cardiac outcomes. Left ventricular GLS may offer incremental value on risk stratification as well as on decision-making.

Abstract P1391 Figure 1

tudy or Subgroup	og[Hazard Ra	tiol	SE		No Eve		Veight I	Hazard Ratio V, Random, 95% CI		Hazard IV, Randor		
lashi 2017a			0.0242				72.7%	1.08 [1.03, 1.13]			-	
ark 2015a			0.1339				27.3%	1.31 [1.01, 1.71]				
otal (95% CI)				162		961 1	00.0%	1.14 [0.96, 1.35]			-	
leterogeneity: Tau ² = 0. est for overall effect: Z				- 0.15	i); f* = !	51%			0.5	0.7 Worse with higher GLS	1.5 Worse with lower GLS	2
	Ev	ent		N	Even	t		Std. Mean Diff	erence	Std. M	lean Difference	
Study or Subgroup		ent SD	Total	Nean	SD	Tota	l Weig				Mean Difference andom, 95% CI	
Study or Subgroup			Total 671					ht IV, Random,	95% C	I IV, Ra		
	Mean	SD		Mean	SD	Tota	2 20.0	ht IV, Random,	95% C	I IV, Ra		
Alashi 2017b	Mean 19.5	2 2	671	Mean 19.5	SD 2	Tota 39	2 20.0	ht IV, Random, 0% 0.00 [-0.13 7% -0.79 [-1.38]	95% C 2, 0.12 , -0.21	1 IV, Ra 1 1		
Alashi 2017b Ewe 2015	Mean 19.5 15.7	SD 2 2 3.3	671 26	Mean 19.5 17.6	SD 2 2.7 2.6	Tota 392	2 20.0 3 16.7 7 14.3	ht IV, Random, 0% 0.00 [-0.13 7% -0.79 [-1.38]	95% C 2, 0.12 , -0.21 , -0.13	1 IV, Ra 1 1		
Alashi 2017b Ewe 2015 Olsen 2011a	Mean 19.5 15.7 16.3	SD 2 3.3 4.2	671 26 8 29	Mean 19.5 17.6 19	SD 2 2.7 2.6 2.9	Tota 39 2 2	2 20.0 3 16.3 7 14.3 5 17.1	ht IV, Random, 0% 0.00 [-0.13 7% -0.79 [-1.38 2% -0.95 [-1.78 1% -1.20 [-1.73	95% C 2, 0.12 , -0.21 , -0.13 , -0.66	I IV, Ra		
Alashi 2017b Ewe 2015 Olsen 2011a Olsen 2011b	Mean 19.5 15.7 16.3 14	SD 2 3.3 4.2 4.7	671 26 8 29	Mean 19.5 17.6 19 18.3	SD 2 2.7 2.6 2.9 4.12	Tota 39 2: 2: 3:	2 20.0 3 16.3 7 14.3 5 17.3 2 17.3	ht IV, Random, 0% 0.00 [-0.13 7% -0.79 [-1.38 2% -0.95 [-1.78 1% -1.20 [-1.73	95% C 2, 0.12 , -0.21 , -0.13 , -0.66 8, 0.47	1 IV, Ra		
Alashi 2017b Ewe 2015 Olsen 2011a Olsen 2011b Park 2015b	Mean 19.5 15.7 16.3 14 14.61	SD 2 3.3 4.2 4.7	671 26 8 29 38	Mean 19.5 17.6 19 18.3 14.84	SD 2 2.7 2.6 2.9 4.12	Tota 39: 2: 3: 2: 3: 2: 2: 2: 2:	2 20.0 3 16.3 7 14.3 5 17.3 2 17.3 8 14.3	ht IV, Random, 0% 0.00 [-0.12 7% -0.79 [-1.38, 2% -0.95 [-1.78, 1% -1.20 [-1.73, 3% -0.05 [-0.51]	95% C 2, 0.12 , -0.21 , -0.13 , -0.66 8, 0.47 , -0.87			

Figure 1 Top. Forest plot for adjusted mortality hazard ratio in chronic asymptomatic AR patients. Bottom. Forest plot of mean GLS in the event and no event patient subgroups. GLS is shown in absolute values.