Global longitudinal strain in patients with severe aortic stenosis and preserved left ventricular systolic function: a single center study using two-dimensional speckle tracking echocardiography

Ivana Jurin^{1*},
Dubravka Šušnjar¹,
Josip Varvodić¹,
Igor Rudež¹,
Frane Paić²,
Irzal Hadžibegović¹

¹University Hospital Dubrava,
Zagreb, Croatia

²University of Zagreb School of
Medicine, Zagreb, Croatia

KEYWORDS: global longitudinal strain, severe aortic stenosis, preserved systolic function.

CITATION: Cardiol Croat. 2018;13(5-6):199. | <https://doi.org/10.15836/ccar2018.199>

***ADDRESS FOR CORRESPONDENCE:** Ivana Jurin, Klinička bolnica Dubrava, Avenija Gojka Šuška 6, HR-10000 Zagreb, Croatia. / E-mail: ivanajurin1912@gmail.com

ORCID: Ivana Jurin, <https://orcid.org/0000-0002-2637-9691> • Dubravka Šušnjar, <https://orcid.org/0000-0002-9644-9739>
Josip Varvodić, <https://orcid.org/0000-0001-6602-699X> • Igor Rudež, <https://orcid.org/0000-0002-7735-6721>
Frane Paić, <https://orcid.org/0000-0001-9688-8582> • Irzal Hadžibegović, <https://orcid.org/0000-0002-3768-9134>

Background: Strain imaging is an established method for the accurate quantification of left ventricular function and left ventricular global longitudinal strain (GLS) has been shown to be a superior marker of contractility than ejection fraction (EF), and also a good marker for prognosis of patients with aortic stenosis (AS). We prospectively analyzed GLS in context to other relevant clinical parameters in patients with severe aortic stenosis and preserved EF.

Patients and Methods: We preoperatively measured GLS in 42 patients with EF > 45% and severe AS. GLS was obtained using 2D speckle tracking echocardiography and patients were divided into four groups according to GLS quartiles. Relevant clinical and echocardiographic parameters were analyzed in relation to GLS, together with curve estimation regression analyses using GLS as independent variable.

Results: In all, mean EF was 59.3% (SD 8.4%) and mean aortic valve area (AVA) was 0.74 cm² (SD 0.17 cm²). Mean GLS was -16.85% (SD -3.58%) with four groups of patients according to quartiles. Group 1 consisted of 12 patients with mean GLS -20.46%, group 2 of 11 patients with mean GLS -18.85%, group 3 of 10 patients with mean GLS -15.43%, and group 4 represented 8 patients with mean GLS -10.67%. Among many clinical and echocardiographic parameters analyzed, groups differed significantly only by eGFR with group 3 having the lowest value (Kruskal Wallis, p=0.034). Curve estimation regression analysis using GLS as independent variable showed only statistically significant negative correlation of GLS with AVA (beta -0.347, R square 0.12, p=0.026). Left atrial volume index (LAVI) showed nearly significant positive correlation with GLS (beta 0.283, R square 0.08, p=0.06) whereas other parameters showed insignificant correlation.

Conclusions: Almost one third of patients with preserved EF and severe AS have impaired left ventricular function measured with GLS. AVA and LAVI showed to be good predictors of impaired global ejection fraction. GLS should be used as an additional marker of left ventricular dysfunction in all patients with severe aortic stenosis in order to select asymptomatic candidates for early treatment.

RECEIVED:
May 1, 2018

ACCEPTED:
May 10, 2018