Left ventricular rotational mechanics in identical twins with juvenile idiopathic arthritis (from the MAGYAR-Twin study)

Attila Nemes¹, Zsolt Kovács², Anita Kalapos¹, Péter Domsik¹, Tamás Forster¹

¹2nd Department of Medicine and Cardiology Center, Medical Faculty, Albert Szent-Györgyi Clinical Center, University of Szeged, Szeged, Hungary; ²Department of Cardiology, Szent Rókus Hospital, Baja, Hungary

Correspondence to: Attila Nemes, MD, PhD, DSc, FESC. 2nd Department of Medicine and Cardiology Center, Medical Faculty, Albert Szent-Györgyi Clinical Center, University of Szeged, P.O. Box 427, H-6725 Szeged, Semmelweis street 8, Hungary. Email: nemes.attila@med.u-szeged.hu.

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We report the case of a 21-year-old Hungarian genetically identical monozygotic female pair of twins who were involved in Motion Analysis of the heart and Great vessels bY three-dimensionAl (3D) speckle tRacking echocardiography in Twins (MAGYAR-Twin) study. Small joints of the first-born twin (twin A) were affected by early onset seronegative juvenile idiopathic arthritis (JIA) at the age of 10 years (1,2). She was treated later for bronchial asthma and nodular goiter with hypothyroidism with substitution therapy from the age of 13 years. The secondborn twin (twin B) was diagnosed with similar symptoms of JIA at the age of 13 years together with thyreoiditis. In twin A, 3D speckle-tracking echocardiography revealed normal left ventricular (LV) strains: segmental peak radial, circumferential, longitudinal, 3D and area strains proved to be $31.3\% \pm 17.1\%$, $-29.1\% \pm 5.8\%$, $-18.2\% \pm 4.9\%$, 31.2%±15.6%, -42.4%±7.5%, respectively. In twin B, similar strains could be detected: 29.4%±6.0%, -25.2%±6.4%, -14.0%±8.5%, 28.0%±7.2%, -37.2%±8.5%, respectively (3). The normally clockwise oriented basal LV rotation was normal in magnitude in both cases (-3.46 degree in twin A and -3.99 degree in twin B) and its peak proved to be significantly delayed and postsystolic (see white arrows; MSV, minimum systolic volume) (Figure 1) (4). A significant delay and reduction in mainly counterclockwise directed

apical LV rotation could also be demonstrated in both twins (1.80 degree in twin A and 2.27 degree in twin B) suggesting diminished and ineffective LV twist (see yellow arrows). In the presented twins, similarly deteriorated LV apical rotations could be detected with preserved strains, similar quantitative features of wall motions. The real mechanism behind the findings is not known, but could be explained by the chronic inflammation, however, other reasons could not be excluded.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

Ethical Statement: The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national guidelines on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008, and has been approved by the institutional committee of the University of Szeged.

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Figure 1 Apical four- and two-chamber views and three short-axis views, three-dimensional cast of the left ventricle and volumetric data of twins A and B and that of a control subject are presented together with their left ventricular (LV) apical, midventricular and basal rotational curves. Significant apical LV hyporotations could be demonstrated in twins A and B. MSV, minimum systolic volume.

References

- Aulie HA, Estensen ME, Selvaag AM, Lilleby V, Murbraech K, Flatø B, Aakhus S. Cardiac Function in Adult Patients with Juvenile Idiopathic Arthritis. J Rheumatol 2015;42:1716-23.
- 2. Bharti BB, Kumar S, Kapoor A, Agarwal A, Mishra R, Sinha N. Assessment of left ventricular systolic and diastolic function in juvenile rheumatoid arthritis. J

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Postgrad Med 2004;50:262-5; discussion 266-7.

- Nemes A, Kalapos A, Domsik P, Forster T. Threedimensional speckle-tracking echocardiography -- a further step in non-invasive three-dimensional cardiac imaging. Orv Hetil 2012;153:1570-7.
- Nemes A, Kalapos A, Domsik P, Forster T. Left ventricular rotation and twist of the heart. Clarification of some concepts. Orv Hetil 2012;153:1547-51.