The International Journal of Cardiovascular Imaging (2022) 38:1813–1814
https://doi.org/10.1007/s10554-022-02674-0

COMMENT

Demonstration of subclinical involvement with pulmonary arterial stiffness in patients with systemic sclerosis without overt pulmonary hypertension

Mustafa Dogdus[1]

Received: 25 April 2022 / Accepted: 11 June 2022 / Published online: 5 July 2022

Editorial commentary

I read the interesting study evaluating "Assessment of Pulmonary Arterial Stiffness in Patients with Systemic Sclerosis without Overt Pulmonary Hypertension" by Coksevim et al. It is very well known that the development of pulmonary hypertension noticeably increases morbidity and mortality in all conditions [1]. Considering the incidence of pulmonary hypertension associated with connective tissue diseases (CTD), especially in patients with systemic sclerosis, the impact of early diagnosis and treatment on prognosis in this patient group is obvious [2]. All scientific efforts to be made in this context are significant.

In patients with systemic sclerosis, a diagnosis of pulmonary hypertension can be made within 10–15 years from the time of diagnosis [3]. Current guidelines recommend annual screening with echocardiography in patients who do not develop overt pulmonary hypertension, but no specific treatment is recommended unless overt pulmonary hypertension develops. Parameters such as peak tricuspid regurgitation velocity, right atrial area, tissue doppler RV-MPI, or PAS can be used as predictors for the development of pulmonary hypertension [4].

Increased PAS values have determined impaired pulmonary distensibility in many clinical studies [5–7]. For instance, Cerik et al. found significantly higher PAS values in HIV (+) patients than in HIV (−) patients [5]. Likewise, Baysal et al. also obtained similar findings in newly diagnosed asthma patients [6].

In their cross-sectional study, Coksevim et al. found a significant increase in PAS value in patients with systemic sclerosis compared to the healthy control group. They also revealed that the impairment in PAS value showed a positive correlation with the duration of the disease. However, since prospective follow-up of these patients could not be performed, it could not be mentioned which PAS value was predictive for the development of pulmonary hypertension.

The gold standard method for PAS measurement is right heart catheterization. There are studies that compare MRI and RCH in the literature and the results are similar [8]. However, these methods can be used very limitedly in clinical practice because they are not easily applicable and accessible. Measuring PAS in a more accessible and easy way with echocardiography is promising for the future. Echocardiographically evaluated PAS was defined as the ratio between the pulmonary flow maximum frequency shift (MFS) and the pulmonary flow acceleration time (PAT). These parameters can be easily measured during standard transthoracic echocardiography.

It is obvious that prospective follow-up studies are needed to demonstrate the clinical significance of echocardiographically measured PAS. However, in the light of current data, PAS draws attention as a promising parameter for the development of pulmonary hypertension in risky patient populations.

Author contributions MD wrote the main manuscript text and reviewed the manuscript.

Funding This work did not receive any specific grant from any funding agency in the public, commercial, or not-for-profit sector.

Declarations

Conflict of interest The authors declare that there is no conflict of interest.

✉ Mustafa Dogdus
mdogdus@hotmail.com

[1] Department of Cardiology, Training and Research Hospital, Usak University, 64100 Usak, Turkey

References

1. Theodorakopoulou MP, Minopoulou I, Sarafidis P et al (2021) Vascular endothelial injury assessed with functional techniques in systemic sclerosis patients with pulmonary arterial hypertension versus systemic sclerosis patients without pulmonary arterial hypertension: a systematic review and meta-analysis. Rheumatol Int 41(6):1045–1053
2. Brown ZR, Nikpour M (2020) Screening for pulmonary arterial hypertension in systemic sclerosis: now or never! Eur J Rheumatol 7(Suppl 3):S187–S192
3. Humbert M, Guignabert C, Bonnet S et al (2019) Pathology and pathobiology of pulmonary hypertension: state of the art and research perspectives. Eur Respir J. https://doi.org/10.1183/13993003.01887-2018
4. Galiè N, Humbert M, Vachiery J-L et al (2016) ESC/ERS guidelines for the diagnosis and treatment of pulmonary hypertension: the joint task force for the diagnosis and treatment of pulmonary hypertension of the European society of cardiology (ESC) and the European respiratory society (ERS): endorsed by: association for European paediatric and congenital cardiology (AEPC), international society for heart and lung transplantation (ISHLT). Eur Heart J 37(1):67–119
5. Cerik IB, Meric M, Gulel O et al (2019) Echocardiographic assessment of pulmonary arterial stiffness in human immunodeficiency virus-infected patients. Echocardiography (Mount Kisco, N.Y.) 36(6):1123–1131
6. Baysal SS, Has M (2019) Evaluation of pulmonary artery stiffness in newly diagnosed adult patients with asthma. Echocardiography (Mount Kisco N.Y.) 36(5):870–876
7. Yenerçağ M, Arslan U, Dereli S et al (2021) A effects of angiotensin receptor neprilysin inhibition on pulmonary arterial stiffness in heart failure with reduced ejection fraction. Int J Cardiovasc Imaging 37(1):165–173
8. Ray JC, Burger C, Mergo P et al (2019) Pulmonary arterial stiffness assessed by cardiovascular magnetic resonance imaging is a predictor of mild pulmonary arterial hypertension. Int J Cardiovasc Imaging 35(10):1881–1892