



# Echocardiography in acute pulmonary embolism

Lampros Lakkas and Christos S. Katsouras

Second Department of Cardiology, University of Ioannina, Ioannina, Greece

We have read with great interest the review article by Oh and Park [1] published in the *Korean Journal of Internal Medicine* regarding the role of echocardiography in acute pulmonary embolism (APE). We totally agree with the authors that although current guidelines do not recommend echocardiography as part of the diagnostic work-up in non-high-risk patients, it is widely used in everyday clinical practice.

The authors reported sensitivity and specificity of the method, calculated from published studies in APE. However, in our opinion, the true figures about these values (especially sensitivity) of echocardiography in APE may be different than the numbers presented in the review. In most of these studies only a number of patients with established APE were recruited. For example, in a study of prospective evaluation of transthoracic echocardiography in emergency department patients with suspected APE, only 124/225 patients (55%) underwent an echo-study (and only 27/39 of the patients with established APE) [2]. In retrospective studies of “consecutive” patients with suspected APE, the patients were included only if they underwent transthoracic echocardiography within 48 hours of computed tomography pulmonary angiography [3,4]. As a result, only a proportion of patients with suspected APE were included in these studies. In some studies, there was no detailed information regarding the initial group of potentially included patients.

Regarding the largest study included in the Table 1 [1], where only 36% (187/526) of the patients with established APE were included in the final analysis, the percentages presented as sensitivity and specificity pertained to predictive ability for massive or sub-massive APE and not APE in general, as the authors described [4]. We think that this could be stated more clearly in the review.

Finally, the authors stated that “echocardiography is helpful as a rule in test in the initial diagnosis of APE”. We think that echocardiography can be useful for diagnosing APE when contrast enhanced computed tomography is not fea-

sible or applicable, in emergency room or intensive care unit patients. The question whether echocardiography can be mandatory as part of the routine diagnostic work-up in haemodynamically stable patients with suspected PE cannot be answered without the results of a well-designed randomized clinical trial that will test the two strategies (whether to include an initial echocardiogram in the algorithm or not). No such trial exists. This question is not simply made on a theoretical basis. European guidelines do not include echocardiography in the diagnostic work up of non-high-risk APE. We think that this should be a sign for the clinicians not to waste time until the diagnosis is confirmed or excluded. In the meantime, in patients with high or intermediate clinical probability of APE, anticoagulation should be initiated while waiting for the results of the diagnostic tests [5]. We must not forget that one out of three deaths due to APE occurred suddenly or within a few hours of the acute event, before therapy could be initiated or take effect, and in more than 50% of deaths the diagnosis has been rendered possible at the post mortem examination [5].

## REFERENCES

1. Oh JK, Park JH. Role of echocardiography in acute pulmonary embolism. *Korean J Intern Med* 2023 Jan 2 [Epub]. doi: 10.3904/kjim.2022.273.
2. Jackson RE, Rudoni RR, Hauser AM, Pascual RG, Hussey ME. Prospective evaluation of two-dimensional transthoracic echocardiography in emergency department patients with suspected pulmonary embolism. *Acad Emerg Med* 2000;7:994-998.
3. Lodato JA, Ward RP, Lang RM. Echocardiographic predictors of pulmonary embolism in patients referred for helical CT. *Echocardiography* 2008;25:584-590.
4. Afonso L, Sood A, Akintoye E, et al. A Doppler echocardiographic pulmonary flow marker of massive or submassive acute pulmonary embolus. *J Am Soc Echocardiogr*

2019;32:799-806.

5. Konstantinides SV, Meyer G, Becattini C, et al. 2019 ESC guidelines for the diagnosis and management of acute pulmonary embolism developed in collaboration with the European Respiratory Society (ERS). *Eur Heart J* 2020;41:543-603.

---

**Received** : January 9, 2023

**Accepted** : March 3, 2023

**Correspondence to**

Christos S. Katsouras, M.D., Ph.D.

Second Department of Cardiology, University of Ioannina, Stavrou

Niarchou Avenue, Ioannina 45100, Greece  
Tel: +30-2651099677, Fax: +30-2651099676  
E-mail: cskats@yahoo.com  
<https://orcid.org/0000-0001-7638-9217>

**CRedit authorship contributions**

Lampros Lakkas: conceptualization, methodology, investigation, writing - original draft, writing - review & editing; Christos S. Katsouras: conceptualization, methodology, investigation, writing - original draft, writing - review & editing, supervision

**Conflicts of interest**

The authors disclose no conflicts.

**Funding**

None