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Editorial

The inevitable lightness of echocardioscopy: teamwork, training and quality assurance are indispensable

La inevitable levedad de la ecocardioscopia: trabajo en equipo, formación y control de calidad son imprescindibles

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Transthoracic echocardiography (TTE) is a diagnostic technique enabling the rapid and noninvasive collection of a huge amount of pertinent information in different clinical situations. The responsibility for its performance, reading, and interpretation has traditionally fallen to cardiology specialists. In the last decade, interest has grown among noncardiology physicians in the use of this technique to rapidly resolve practical management issues related to areas of interest in different specialities.[1] TTE can provide data in distinct fields that may lead to major changes in patient management, such as in emergency departments, critical care units, stroke units, and primary care.

Based on this need, the term focused cardiac ultrasound has arisen to refer to the concept of the interpretation of echocardiographic findings obtained at the bedside as an extension of the physical examination, which, together with the clinical information, enable a more accurate and flexible approach, both diagnostic and therapeutic.[2] Clinicians who perform focused cardiac ultrasound concentrate their examination on the specific assessment of a condition or group of conditions. If any abnormality is suspected, the study should be reviewed by a cardiac imaging laboratory to validate the findings or indicate the need for comprehensive TTE. Understandably, the specialists who perform focused cardiac ultrasound should undergo training, whether via training stays in certified echocardiography laboratories with cardiac imaging specialists or, ideally, via educational courses approved by the corresponding scientific societies.

The differences between focused cardiac ultrasound and comprehensive TTE must be understood to safely and consistently interpret the information provided by the 2 modalities. The main difference is the approach during the performance of the study and the technical understanding of the specialist interpreting the findings. Focused cardiac ultrasound is strictly aimed at ruling out the presence or absence of specific abnormalities and is dependent on the clinical context. In contrast, comprehensive and complete TTE has a comprehensive objective and aims to obtain the maximum amount of information, independent of the motive, and, no less important, provides the ability to clearly discriminate pathological findings or assess the need for a complementary test that will confirm its findings. Given the nature of focused cardiac ultrasound, the study is habitually conducted at the bedside or during the physical examination. Compared with comprehensive TTE, less time is required for focused cardiac ultrasound because fewer planes are examined, given that its objective is highly specific and, in many occasions, the knowledge of the operator is limited.[3] Although focused cardiac ultrasound could play a key role in many situations, robust scientific literature supporting its safety and usefulness is lacking for some areas. Nonetheless, the use of this technique is continually growing, particularly among medical staff who work in emergency departments or who treat critically ill patients, such as intensivists and anesthesiologists.

In the specific field of neurology, both TTE and transesophageal echocardiography are vital for the study of the embolic source in ischemic stroke patients, particularly in those whose etiology is unknown or who have a suspected cardioembolic origin, because the findings can determine the optimal medical therapy.[4] Focused cardiac ultrasound performed by neurology specialists is an ever-growing reality in stroke units in many hospitals, largely due to the need to promptly obtain information to optimize the management as quickly as possible. This approach is restricted by the high demand experienced by many of our cardiac imaging laboratories in Spain.[5,6] Indeed, a consensus document was published in 2018, with the participation of the Spanish Society of Neurology and Spanish Society of Cardiology, to standardize the use of focused cardiac ultrasound.[7]

The study by López-Dequidt et al.,[8] recently published in *Revista Española de Cardiología*, is groundbreaking because it provides scientific evidence concerning the establishment of a focused cardiac ultrasound program performed by noncardiology specialists to identify the embolic source in patients who had an ischemic stroke. In this prospective and single-center study, focused cardiac ultrasound was applied to assess 706 patients with ischemic stroke

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or transient ischemic attack of unknown cause. The studies were performed by a specialist in neurology with prior training in focused cardiac ultrasound via a 6-month stay in a cardiac imaging unit and subsequent accreditation in focused cardiac ultrasound from the Spanish Society of Cardiology, which underlines the major value of the specific training of the medical staff performing these studies. Excluded were patients whose indication for comprehensive TTE was reasonable due to high suspicion of a cardioembolic origin, patients with a known etiology, and patients with poor neurological prognosis or receiving palliative care. The concordance of the findings between focused cardiac ultrasound and comprehensive TTE in the first 100 studies was practically perfect (kappa coefficient = 0.96). All studies with pathological findings of structural heart disease and/or cardioembolic sources were reviewed by cardiac imaging specialists.

Among the 706 focused cardiac ultrasound procedures, structural heart disease was detected in 370 (52%), of which 218 were catalogued as potentially embolic. The 370 studies were reviewed and the findings were directly confirmed with just the focused cardiac ultrasound images in 263; the remaining 107 patients required completion of the examination with comprehensive TTE and/or transesophageal echocardiography; importantly, the latter studies confirmed the presence of structural heart disease and/or cardioembolic sources in 368 of the 370 studies found to contain abnormalities on focused cardiac ultrasound.[8] These results once again showed a high concordance between the focused cardiac ultrasound interpretation and that of cardiologists with advanced echocardiographic training and specialization.

Regarding the studies not reviewed by cardiology, that is, the focused cardiac ultrasound studies not considered to indicate heart disease, it was not possible to know if the patients really did have heart disease, data that would be useful to determine the negative predictive value of focused cardiac ultrasound in this context. Via analysis of the incidence of cardiovascular events in the first postdischarge year (ischemic stroke, acute myocardial infarction, heart failure, atrial fibrillation), significant differences were seen between patients with a de novo diagnosis of structural heart disease and patients whose focused cardiac ultrasound was normal ($P = .003$). Linear multivariate Cox regression showed that de novo heart disease was independently associated with the development of cardiovascular events in the first year, as well as functional status at 3 months of follow-up. All of this permits a study reading that focuses on the key prevention of cardiovascular risk, beyond the prevention of ischemic stroke, because all pathological findings must be treated as specified in the different clinical practice guidelines, with potential benefit for a major group of patients.[9]

Undoubtedly, the work performed in University Clinical Hospital of Santiago de Compostela by López-Dequidt et al.[8] provides scientific evidence supporting the performance of focused cardiac ultrasound programs by noncardiology specialists, because it shows the high concordance between the assessment of studies by specialists in neurology and specialists in cardiac imaging, as well as the high percentage of studies with pathological findings that may lead to an optimization of cardiovascular risk in these patients. It also opens the way to the planning of studies examining the cost-effectiveness of these programs, given the immediacy with which the test can be performed, which would shorten the length of hospital stay and probably help to unblock echocardiography laboratories.

Focused cardiac ultrasound is already a reality in routine clinical practice and, based on the interest of various scientific societies in its application, is going to play ever-larger roles in more and more fields. Understandably, its more widespread use will be due to its various attributes: it is noninvasive, can be performed at the bedside, and even with pocket-sized devices, and has a low cost. As indicated in the article,[8] and supported by all consensus documents concerning the use of echocardiography, the overriding factor is the willingness of the cardiac imaging laboratories to work with all groups that wish to implement this technique in their daily practice. Specialists in cardiology must seamlessly review all studies with pathological findings, which is why the use is recommended of an online image storage system to enable the subsequent revision of images.[1–3]

The training and accreditation of noncardiological medical staff are the cornerstones for the optimal functioning of this network. All staff performing the examination should be accredited and should have performed a large number of such studies under the supervision of an echocardiographer. No universal criteria are available that indicate the amount of training that these individuals should have undergone, although studies have provided information suggesting the necessary standards.[10,11] Independently of the specific accreditation of the people performing the focused cardiac ultrasound, they should always have been supervised by a cardiology specialist. It must always be remembered that focused cardiac ultrasound can never replace comprehensive TTE. The data obtained from focused cardiac ultrasound are added as an extension of the physical examination or similar section in the medical report and do not involve the creation of a specific report, in contrast to comprehensive TTE. Noncardiology specialists in charge of focused cardiac ultrasound will have a highly focused objective of their work. Given the inherent differences in the nature of the medical act in which focused cardiac ultrasound is used, it will be necessary to develop an implementation plan in each case together with the supervising cardiologists.

Cost-effectiveness studies in private health care systems from the United States comparing focused cardiac ultrasound programs with routine clinical practice involving comprehensive TTE have shown that focused cardiac ultrasound strategy reduced cost and workload in echocardiography laboratories.[12,13]

In conclusion, there is no foreseeable end to the widespread increase in the implementation of focused cardiac ultrasound programs performed by noncardiology professionals in various fields. Accordingly, we must be prepared to establish training standards for medical staff and to create and define the teamwork flow (between cardiologists and noncardiologists) to successfully benefit patients, professionals, and health care institutions. Cardiologists must be prepared to cease to be the "owners" of this technique and become its "propagators" and "supervisors". Without adequate cardiology leadership, the potential of this safe and low-cost technique with a highly elevated diagnostic yield in the hands and minds of appropriate interpreters could be at risk. Once again, work in a network and team will be essential to maintain quality and diagnostic yield standards.

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CONFLICTS OF INTEREST

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