Letter

Echocardiography: a fundamental part of the intensive care curriculum

Joaquim Palmeiro Ribeiro*, Paulo Marcelino†, Susan Marum† and Ana Paula Fernandes†, for the Echocardiography Working Group of the Portuguese Society of Intensive Care

*Director, Intensive Care Unit, Curry Cabral Hospital, Lisbon, Portugal
†Consultant in Internal Medicine, Intensive Care Unit, Curry Cabral Hospital, Lisbon, Portugal

Correspondence: Susan Marum, susan.mar@mail.telepac.pt

Published online: 8 March 2002 *Critical Care* 2002, **6**:175

The purpose of this letter is to emphasize some of the particular attributes of echocardiography, based on our experience over 20 years in its application in critically ill patients. In our opinion echocardiography is under-used, and its benefits can only truly be recognized if it is routinely applied as a diagnostic tool. In fact, it is a highly dynamic technique that permits direct visualization and assessment of all of the cardiac structures, as well as of the pulmonary artery and haemodynamic status. More than any other diagnostic tool, echocardiography allows detection of valvular disease; evaluation of systolic and diastolic function, and pericardial disease; and demonstration of intracardiac shunts and quantification thereof. Furthermore, one can calculate flows and pressures at various levels, study systole and diastole, and ultimately determine whether the data obtained are accurate, based on the dynamics of cardiac structures. Haemodynamic evaluation provides information in a just a few minutes, making it possible to initiate interventions immediately, at the level of volume repletion, cardiac contractility or peripheral resistance.

Besides the primary cardiac entities (e.g. myocardial infarction, valvular disease and thrombi, etc.) that may benefit from echocardiographic evaluation, other cardiac abnormalities may also be revealed under stressful conditions. Among these, diastolic dysfunction deserves particular attention because it is quite common in those beyond middle age, and may assume great importance in a critically ill patient with sepsis, pneumonia or chronic respiratory disease. If undetected, it may determine the difference between life and death. Our group identified a highly significant correlation between the isovolumetric relaxation time (an important phase of diastole) and time of weaning from mechanical ventilation [1].

Other situations that are frequently encountered involve myocardium stunning, which may occur in diverse critical illnesses, as we mentioned before. Less common but no less important are right/left intracardiac shunts, which are often unsuspected and responsible for unexplained clinical deterioration in patients subjected to positive pressure ventilation. When a mechanically ventilated patient becomes more hypoxaemic despite efforts to improve ventilation, shunt-induced hypoxemia caused by a patent foramen ovale should be suspected, among other causes such as pulmonary embolism [2]. Only echocardiography can identify such specific abnormalities in mechanically ventilated patients, when weaning is difficult or refractory hypoxaemia is not explained by pulmonary disease alone.

The main issue is that, globally, further knowledge and practice of echocardiography are required if we are to recognize its potential within the framework of general intensive care. Thus, our message is that we must first study patients using echocardiography, including clinical data, and then act accordingly.

The contribution of echocardiography to the diagnosis and prompt treatment of many commonly overlooked situations may ultimately be associated with a decrease in morbidity and mortality. For this reason, we must promote training in echocardiography, as well as its routine use as an essential examination [3,4].

In our opinion, based on 20 years experience in echocardiography, the enormous advantages offered by this noninvasive technique renders it an indispensable tool in general intensive care units; consequently, training of physicians from specialities other than cardiology is required. Bluntly, it must become part of the intensivist's curriculum.

Reference

1. Ribeiro J, Marcelino P, Fernandes AP, Marum S: **Systolic and diastolic dysfunction in ventilated patients [in Portuguese].** *Anamnesis* 2001, **10**:5-10.
2. Marum S, Fernandes AP, Marcelino P, Ribeiro J: **Refractory hypoxemia and patent foramen ovale.** *Anamnesis* 2001, **10**:15-16.
3. Ribeiro J, Guimarães R, Marcelino P, Silva MR, Marum S, Mota JA: **The role of echocardiography in intensive care [in Portugese].** *Rev Port Cardiol* 1995, **14**:1033-1038.
4. Ribeiro J, Marum S, Marcelino P: **Echocardiography in general intensive care [in Portuguese].** *Anamnesis* 2000, **9**:5-6.