Abstract 101 Figure 2 Kaplan–Meier survival estimate of time to hard event.

Pocket-size hand-held cardiac ultrasound in the hands of students and junior doctors: does it improve diagnostic accuracy over history, physical examination and ECG?


Background Even though patient history taking and physical examination remain the foundations of patient evaluation in daily clinical practise, there has been a decline in the accuracy of the later. Pocket hand held echocardiographic (PHHE) devices have recently been introduced and could potentially improve diagnostic accuracy in the hands of non-cardiologists. The amount of training required to achieve optimal results remains a matter of debate.

Aim We hypothesised that use of PHHE after limited training, can improve diagnostic accuracy even in the hands of medical students and inexperienced physicians.

Methods Five final year medical students and 3 junior doctors without prior echocardiographic experience participated in a standardised 2-h PHHE bed-side training program. Subsequently they assessed 122 patients (history taking, physical examination, ECG interpretation and PHHE). Their physical and echocardiographic findings were compared to those of a transthoracic echocardiographic accredited cardiologist.

Results A total of 122 V-scans were performed of which 64 (53%) by final-year medical students and 38 (31%) by junior doctors. Mean age of the participants was 23 ±16 years and 87 (71.3%) were male. Out of 122 patients, 69 (56.6%) had LV dysfunction, 16 (13.1%) had RV dysfunction, 74 (60.5%) had valvular abnormalities, 5 (4.1%) had prosthetic valves, 6 (4.9%) had pericardial effusions and 4 (3.3%) ascending aorta disease. Mean±SD for diagnostic accuracy (maximum=1) after history, physical examination and ECG interpretation was 0.58±0.19 whereas addition of PHHE increased its value to 0.85±0.2 (Z=-8.964, p<0.001). In 82 (73.5%) patients there was concordance between cardiologist and trainees in LV assessment, in 23 (19.1%) trainees underestimated or overestimated LV by one grade and in 9 (7.4%) by at least two grades. When assessing for presence of moderate to severe left ventricular dysfunction by means of history and physical examination specificity was 84.9% and sensitivity only 28.9% whereas after PHHE these figures raised to 93.6% and 74.1% respectively. There were a total of 94 valvular lesions (present in 74 patients), 10 of which (10.6%) were stenotic and 84 (89.3%) regurgitant. There was a total of 40 moderate to severe valvular regurgitation lesions. Trainee sensitivity in identifying the afore mentioned lesions was 70% whereas specificity 98%. Regarding moderate to severe valvular stenosis sensitivity was 85.7% whereas specificity was 100%. Auscultation for presence of valvular abnormality (without specifying which valve or what kind of abnormality) revealed a 93.8% specificity and a 45.9% sensitivity.

Conclusions In the current study use of PHHE after brief, bed-side training greatly improved the diagnostic accuracy of medical students and junior doctors, over and above history, physical examination and ECG interpretation.