1550793

Screening for Rheumatic Heart Disease: A New Way for an Old Problem

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Background: Rheumatic heart disease (RHD) is a common disease, which remains a major cause of morbidity and premature death especially in developing countries. Screening programs have shown that physical examination (PE) is not a sensitive tool for its' early detection, so diagnosis relies on echocardiographic studies that are expertise dependent and expensive. We evaluated the accuracy of echocardiographic assessment by briefly trained examiners to identify RHD utilizing a portable, easy to use, hand-carried ultrasound (HCU) device.

Methods: Three 6th year medical students received 8 hours of training in cardiac ultrasound, focused on the assessment of rheumatic valve injury. They operated an HCU device, OptiGo™ weighing 2.9 kg. The medical students, blinded to the medical condition of the patients, performed a PE and then a focused HCU study on volunteers and on patients with known RHD. A standard echocardiography study was used to validate the students' results.

Results: Each student performed a PE and HCU study on 23 patients (mean age 54 ± 6 years, 68% females), 14 of them having rheumatic mitral valve injury. The sensitivity for diagnosing RHD by PE and HCU was 18% and 81%, respectively; and specificity of 97% and 85%, respectively. The table depicts inter-observer variability of both diagnostic techniques.

Conclusions: Medical students' ability to detect rheumatic valve injury with a portable ultrasound device, after brief echocardiographic training is significantly superior to that of physical examination. These results highlight the utility of portable cardiac ultrasound devices operated by basic-trained personnel as a valuable tool for screening for RHD, especially in low-income countries with a high prevalence of the disease.

Parameters	Tool	Student 1	Student 2	Student 3	Average
Rheumatic mitral injury (n= 14)	Physical exam	31%	8%	16%	18%
	Hand-carried ultrasound	86%	93%	65%	81%
Control (n= 9)	Physical exam	100%	100%	88%	97%
	Hand-carried ultrasound	100%	88%	66%	85%