Background: Aortic valve sclerosis (AVS), mitral annular calcification (MAC), and aortic root sclerosis (ARS) have been demonstrated to be markers of coronary artery disease. Aims: 1) To test the diagnostic potential of a hand-held ultrasound device for the screening for AVS, MAC and ARS in patients with known or suspected coronary artery disease (CAD). 2) To evaluate the relation between AVS, MAC and ARS and CAD assessed at rest or stress induced new wall motion abnormalities duringdobutamine stress echocardiography (DSE).

Methods: Seventy-two patients (68 men, mean age 61±12 years) were referred for the evaluation of known or suspected CAD. All patients were examined with a hand-held device (HD) to assess AVS, MAC and ARS. Left ventricular long axis view, short axis, 3 and 5 apical chamber views were acquired by 2 independent cardiologists using the HD and a standard echocardiography-system (SE). The SE was used as reference. AVS was scored using a 4-point grading scale: 1=normal, 2=mildly sclerotic, 3=moderately sclerotic and, 4=severely sclerotic, with calcifica- tions. MAC and ARS were defined as an increased echoreflectance and thickness of the mitral annulus and of the anterior or posterior wall, respectively. Subsequently all patients were evaluated for rest and stress induced wall motion abnormalities.

Results: Aortic valve, mitral annulus and aortic root were visualized in 70 (97%) and 68 (94%) patients respectively with SE and HD (p=NS). AVS, MAC, and ARS were present in respectively 97%, 40%, and 60% using SE, and 92%, 33%, and 58% using the HD (p=NS). There was a good agreement between the 2 imaging devices for the detection of all aortic valve cusps (right cusp 93.2%, k=0.89; left cusp 94.7%, k=0.88, non coronary cusps 81.4%, k=0.74). The agreement was also good for evaluation of MAC and ARS, respectively 89.7%, k=0.78 and 92.6%, k=0.96. During DSE wall motion abnormalities at rest and ischemic segments at peak were present respectively in 36 (50%) and 11 (13%) of patients. There was no correlation between the grade of AVS and the number of dysfunctional segments at rest (p=0.20) or the number of ischemic segments at peak DSE (p=0.21).

Conclusion: Hand-held echocardiography is a simple, reliable and inexpensive tool to screen patients for AVS, MAC, and ARS.

Background: The performance of hand-carried ultrasound devices for assessment of regional myocardial function has been evaluated in contrast to complex echocardiographic systems. However, these studies are limited to the assessment of left ventricular function and the presence of valvular disease.

Methods: We studied the potential of a hand-held stethoscope (HCU, SonosHeart Plus) and a standard echocardiography-system (SES) HP 5500 system. Both systems have harmonic imaging capabilities. Two echocardiographers independently analysed all the studies. An endocardial visualization score index (EVSI) was calculated as a mean of the 16 segments. For each segment (1=poorly, 2=well visualized), segmental function was scored (1=not interpretable, 2=not sure, 3=sure). Global LV systolic function was visually estimated as normal, mildly, moderately and severely reduced.

Results: In native images, the EVSI was 1.44±0.31 for SES and 1.21±0.31 for HCU (p<0.01). In contrast-enhanced images, the EVSI increased to 1.95±0.07 for the SES (p<0.001 vs native) and to 1.81±0.07 for the HCU (p<0.001 vs native). The segments with a scoring confidence level 3 increased from 120 in native to 187 in contrast-enhanced images with SES (p<0.0001) and from 80 in native to 176 in contrast-enhancement images with HCU (p<0.0001). After contrast enhancement the agreement in global and segmental LV function estimation between the SES and the HCU increased from good to excellent (from 79% to 95% for segmental and from 83% to 100% for global LV function). Inter- and intra-observer variability was assessed for both the native and the contrast-enhanced images.

Conclusion: Contrast enhancement of LV endocardial border improves assessment of global and segmental LV function. We evaluate whether this is also true with a hand-carried ultrasound device (HCU).

Background: Contrast enhancement of the left ventricular (LV) endocardial bor- der improves assessment of global and segmental systolic function. We evaluate whether this is also true with a hand-carried ultrasound device (HCU).

Methods: 12 patients were studied, before and after the IV injection of an echocon- trast agent (Sonovue), both with a HCU (SonoHeart Plus) and a standard echocar- diographic system (SES) HP 5500 system. Both systems have harmonic imaging capabilities. Two echocardiographers independently analysed all the studies. An endocardial visualization score index (EVSI) was calculated as a mean of the 16 segments. For each segment (1=poorly, 2=well visualized), segmental function was scored (1=not interpretable, 2=not sure, 3=sure). Global LV systolic function was visually estimated as normal, mildly, moderately and severely reduced. Inter- and intra-observer variability was assessed for both the native and the contrast-enhanced images.

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Conclusion: Contrast enhancement of LV endocardial border improves assessment of both global and segmental LV function both with standard and HCU de- vices. The performance of a HCU device in combination with a contrast agent is comparable to the SES. This may have important implications for the use of HCU devices at the point-of-care in critical care environment and chest pain clinics.