index beat, with small bias and narrow limits of agreement [in brackets]: intra -1.1 [-4.9 to 2.7] and inter -0.7 [-5.4 to 3.9]; verses 3 averaged beats -1.1 [-5.4 to 3.1] and -2 [-6.5 to 4.7]; 5 averaged beats -1.1 [-5.6 to 3.4] and -1.2 [-6.6 to 4.2]; and 10 averaged beats -1.0 [-5.0 to 3.0] and -0.9 [-6.2 to 4.3]. Inter-observer limits of agreement for E/e' were also the narrowest for the index beat method: -1.6 [-0.4 to 3.7]; verses 3 averaged beats -0.6 [-3.5 to 2.2]; 5 averaged beats -0.4 [-3.1 to 2.2]; and 10 averaged beats -0.1 [-2.5 to 2.2].

Conclusion In patients with AF, an index beat method is more reproducible than the conventional method of averaging multiple consecutive beats. This approach can enhance the reliability of measurements for both systolic and diastolic left ventricular function in patients with AF.

Conflict of Interest Nothing to declare

11 THE IMPACT OF MISCLASSIFYING LEFT VENTRICULAR SIZE IF INDEXING TO BODY SURFACE AREA IS NOT PERFORMED

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Introduction Guidelines recommend indexing measurements of left ventricle (LV) size to body surface area (BSA) to improve clinical validity. We sought to highlight the potential impact of misclassifying LV size in patients if indexing is not performed.

Methods We reviewed the reports of all trans-thoracic echocardiograms performed at a large tertiary centre for cardiology and compared proportions of patients with LV dilatation based on LV internal diastolic dimension (LVIDd) > 5.8 cm (male), >5.2 cm (female) or indexed (Dubois) LVIDd > 3.0cm/m^2 (male), > 3.1cm/m^2 (female). We also identified all reports with a diagnosis of moderate-severe or severe aortic regurgitation and compared proportions of patients with LV dilatation that would reach the threshold for surgical intervention when indexed and non-indexed values are used.

Results 20397 echocardiogram reports were reviewed. LV dilatation was present in 2821 (13.8%) based on non-indexed LVIDd compared to 2083 (10.2%) using indexed LVDD. After indexing for BSA 2202 (10.8%) patients changed category: 1470 (7.2%) patients deemed to have a dilated LV based on LVIDd were reclassified as normal, whereas 732 (3.6%) patients deemed to have a normal sized LV were reclassified as dilated when LVIDd was indexed.

Reports of 71 patients with moderate-severe or severe aortic regurgitation were reviewed. 5 (7.0%) had a LV internal systolic dimension (LVIDs) >5cm meeting criteria to consider surgery. When indexed to BSA, 15 (21.1%) had indexed LVIDs >2.5cm/m^2 with 11 (15.5%) changing from normal LVIDs to dilated LVIDs when indexed.

Conclusion Indexing left ventricular dimensions results in reclassification of 10.8% of patients, which could have implications on clinical management decisions. Furthermore, up to 15.5% of patients with aortic regurgitation may transition from non-dilated to dilated LVIDs when indexed values are used and so impact on timing of surgical referral. Uncorrected and BSA corrected quantitative measurements should be available on all echocardiogram reports.

Conflict of Interest None

12 SEX DIFFERENCES IN THE AGREEMENT BETWEEN LEFT VENTRICULAR EJECTION FRACTION MEASURED BY MYOCARDIAL PERFUSION SCINTIGRAPHY AND BY ECHOCARDIOGRAPHY

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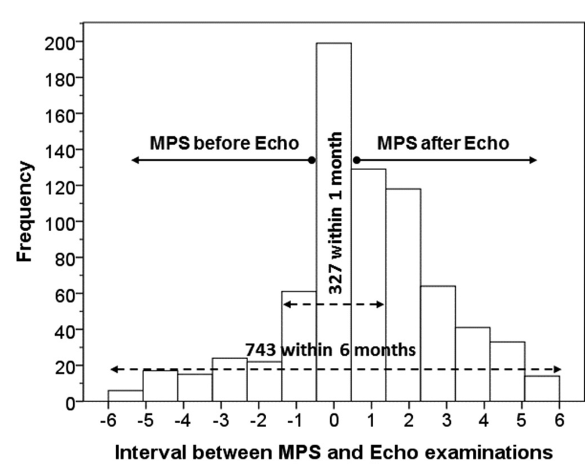
Background Left ventricular ejection fraction (LVEF) is generally measured by echocardiography (Echo) but is increasingly available with myocardial perfusion scintigraphy (MPS). With MPS the threshold of LVEF below which there is a risk for myocardial infarct or sudden cardiac death is higher for women (51%) than for men (43%) [Shahir T, *et al*. J Nucl Cardiol 2006;13:495–506]. We tested the hypothesis that such a sex difference may also occur with Echo and MPS, by comparing LVEF measured by both methods.

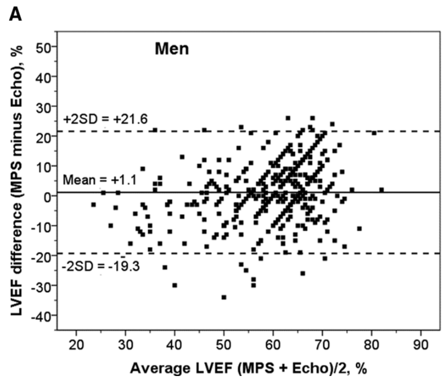
Participants and setting: A total of 1141 patients underwent cardiac assessment, including resting LVEF measured both by MPS and Echo. Of these 743 patients (404 men, mean age=67.7±SD=12.3 yr; 339 women, 67.7±11.7 yr) had separate examinations within 6months and their data used for analysis. A subset of 327 of these patients (181 men, 68.8±12.1 yr; 146 women, 66.4±12.1 yr) had examinations at a shorter time apart (within 1month) and were additionally analysed as this sub-group. All examinations were at Ashford & St Peter's NHS Foundation Trust between 30–11–2012 and 30–05–2017 (figure 1).

Methods The rest MPS was performed with the injection of 99mTc-tetrofosmin (600–1000MBq). Images were obtained using dual-head SPECT cameras (Siemens Symbia S, Erlangen, Germany) and LVEF was determined from gated images. The rest Echo was performed with a high-end 2-dimensional echocardiographic unit (Sonos 5500, Andover, Mass., US or Vingmed System V, Horten, Norway) and images were acquired with standard parasternal, short-axis and apical views and LVEF was calculated by the modified Simpson's biplane disks method. Agreement between MPS and Echo (neither considered as a reference method) was assessed by Bland-Altman plots: LVEF difference (MPS minus Echo) against average LVEF ((MPS+Echo)/2). Data are presented as means and ±SD.

Results Of patients who had MPS and Echo examinations within 6months, mean LVEF difference was +1.1% (95% limits



Abstract 12 Figure 1



Abstract 12 Figure 2

of agreement (±2SD)=-19.3 to +21.6) in men (figure 2a) but +10.9% (-10.7 to +32.5) in women (figure 2b). A one-tailed t-test showed LVEF difference diverged from zero only marginally in men (mean difference=+1.1, 95%CI=+0.1 to +2.1, p=0.028) but more in women (+10.9, +9.8 to +12.1, p<0.001). The LVEF difference correlated significantly with average LVEF itself in both men (r=0.305, p<0.001) and women (r=0.361, p<0.001), and with age in women (r=0.117, p=0.031). Similar results were observed for the subset (MPS and Echo performed within 1month apart): LVEF difference was +1.3% (-18.1 to +20.7) in men and +11.3% (-10.6 to +33.2) in women. The LVEF difference again correlated significantly with average LVEF in men (r=0.361, p<0.001) and women (r=0.392, p<0.001), but not with age in either sex.

Conclusion Caution should be taken when interpreting LVEF measured by different techniques due to their wide limits of agreement and systematic bias, more markedly in women. Our data however cannot provide an underlying explanation for these differences but physiological and anatomical differences between men and women may contribute, e.g. cardiac morphology, haemodynamics and body habitus.

Conflict of Interest None

13 ABSTRACT WITHDRAWN

14 EFFICACY OF HANDHELD ECHOCARDIOGRAPHY AT GRADING LEFT VENTRICULAR AND LEFT-SIDED VALVULAR DYSFUNCTION COMPARED TO STANDARD TRANSTHORACIC ECHOCARDIOGRAPHY BEFORE AND AFTER EDUCATIONAL INTERVENTION AT A CENTRAL LONDON TEACHING HOSPITAL

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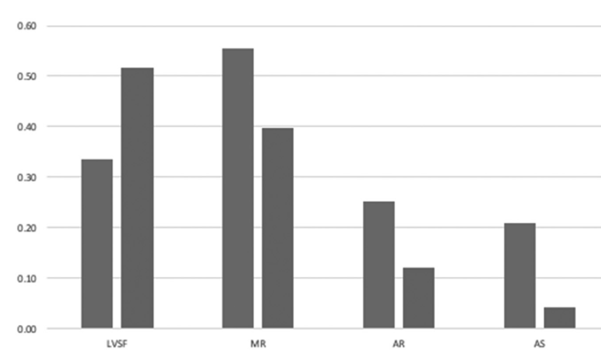
Introduction The use of handheld echocardiography (hTTE) is increasing, due to its diagnostic value in a number of clinical scenarios coupled with its availability, portability and relatively low cost1. The well-documented limitations of hTTE compared to standard TTE (sTTE) include operator experience in both image acquisition and interpretation2. Our first aim was to quantify the discrepancy when assessing left-sided cardiac pathology. Secondly, we aimed to identify whether this was amenable to improvement following educational intervention.

Methods We retrospectively identified 119 patients who underwent both hTTE and sTTE. Cardiology specialist trainees (STs) performed hTTE and this was compared to sTTE performed by blinded BSE accredited sonographers (gold standard). The parameters assessed and the grading system used is detailed below (table 1). Concordance between hTTE and sTTE was evaluated, both pre- and post-education, by the weighted Kappa statistic. Educational intervention included information given to all cardiology trainees highlighting both the overall cohort performance and confidential individualised feedback. Following this a further 29 patients who underwent both hTTE and sTTE were identified.

Results The average error for all parameters was 0.34 with fair agreement (k = 0.38). Figure 1 and Table 2 highlight the average error for each parameter. Where discrepancy existed, hTTE tended to underestimate severity of each parameter, with the exception of LVSF which was equivocal. The greatest discrepancy was seen when grading MR, and of 80 discordant scans, 57 were due to an underestimation (figure 2). The majority of error was in severe MR. As predicted, performance improved through years of training; ST3s consistently had the highest error compared to other grades, particularly when assessing MR. This improved significantly after education (0.66 to 0.33). Preliminary analysis post-education has shown an increase in overall agreement and a reduction in error when grading valvular pathology, but an increase in error when grading LVSD.



Abstract 14 Figure 1 Graph demonstrating average error in each parameter before and after intervention