ACC.13
62nd Annual Scientific Session & Expo
TCT@ACC-i2

E893
JACC March 12, 2013
Volume 61, Issue 10

Imaging

REFERENCE VALUES FOR RIGHT VENTRICULAR GEOMETRY AND FUNCTION BY 3D ECHOCARDIOGRAPHY: A MULTICENTER STUDY OF 533 HEALTHY SUBJECTS

Poster Contributions
Poster Sessions, Expo North
Saturday, March 09, 2013, 3:45 p.m.-4:30 p.m.

Session Title: Imaging: Echo: RV Imaging
Abstract Category: 18. Imaging: Echo
Presentation Number: 1179-324

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Background: Right ventricular (RV) size and function are important predictors of outcome in heart and lung diseases. 3DE is the only echo modality allowing measurement of RV volumes. However, lack of reference values hinders the adoption of 3DE into routine clinical practice.

Methods: 533 healthy subjects (51% F, 44+/-16 years, range 13-90) were prospectively recruited at 3 Institutions (C1, C2 and C3) to undergo a complete 2D, Doppler and 3D echo. Interinstitutional agreement of RV volume measurements (4D RV function, TomTec Imaging Systems, D) was tested in 30 randomly chosen 3D data sets.

Results: BlandAltman analysis showed a fairly good intercentre agreement for the measurements of both RV end-diastolic (EDV) (C1 vs C2: bias = 9 ml, LOA -41, +23 ml; C2 vs C3: bias= +6 ml, LOA -27, +39 ml; C1 vs C3: bias = 3 ml, LOA -18, +12 ml) and endsystolic volume (ESV) (C1 vs C2: bias = 3 ml, LOA -16, +10 ml; C2 vs C3: bias= 2 ml, LOA -19, +15 ml; C1 vs C3: bias = 5 ml, LOA -18, +8 ml). Multivariable regression analysis (including age, gender, body surface area BSA, systolic and diastolic blood pressure, and heart rate), selectedonly age and BSA as independent predictors of RV EDV (R2= 0.38) and ESV (R2= 0.35).

Conclusions: Availability of reference values should encourage the assessment of RV volumes and ejection fraction in clinical practice and their inclusion in the echo report. We also found significant age related changes in RV size and function that should be taken into account when assessing RV remodelling.

Normative values (median (95%CI)) for right ventricular size and function by 3D echo

Age (yrs	<20 (n= 38)	21-30 (n= 111)	31-40 (n= 92)	41-50 (n= 111)	51-60 (n= 84)	61-70 (n= 67)	71-80 (n= 22)	>80 (n= 8)
EDV (mlm2)	69 (58, 74)	60 (57, 63)	55 (52, 59)	51 (49, 53)	52 (49, 54)	46 (43, 50)	48 (42, 53)	43 (32,54)
ESV (ml/m2)	30 (25,35	25 (23, 27)	21 (19, 25)	19 (18, 21)	20 (18, 22)	16 (15, 18)	16 (13, 19)	13 (7,19)
EF (%)	57 (53, 61)	59 (57, 61)	63 (61, 64)	63 (61, 65)	63 (60, 65)	65 (62, 67)	67 (64, 70)	72 (65, 79)
SV (ml)	65 (57, 33)	62 (59, 66)	62 (58, 65)	57 (54, 60)	58 (55, 61)	54 (49, 59)	56 (49, 62)	50 (40, 59)