

Meeting abstract

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1094 Normal left ventricular structure and function: inflection point in age effects

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Background

Existing studies of normal left ventricular (LV) structure and function using contemporary CMR methods (SSFP) are limited either in sample size, age range or verification of normality. Therefore we evaluated LV structure and function in a large, extensively screened cohort over a wide age range.

Methods

Normotensive, non-diabetic, non-obese (BMI < 28) volunteers (n = 218, 119 females), aged 20–89, were screened by 2D echocardiography and CMR was performed using SSFP cine imaging with contiguous 8 mm slices in the LV short axis plane. LV volumes (EDV, ESV), ejection fraction (EF) and mass (M) were determined and indexed (i) to body surface area. (Medis, MASS).

Results

Women had higher EF and lower EDVi, ESVi and LVMI compared to men. With increasing age, systolic blood pressure increased, EDVi and ESVi decreased, EF increased, LVMI did not show a clear trend and LVMI/EDVi increased. However, there was an inflection point at age 50, with EDVi, ESVi and systolic blood pressure for each decade >50 differing significantly from all decades <50 but no differences among decades <50 or >50 years. (Table 1.)

Conclusion

Age and blood pressure related concentric remodeling results in reduced chamber volumes and increased EF in presence of constant LV mass in both men and women. There is an inflection point at age 50 when chamber volumes fall and blood pressure increases in both genders. Further studies are needed to determine the physiologic basis of changes occurring in LV structure and function at age 50.

Table 1:

Variable	Pooled (n = 218)							Female (n = 119)			Male (n = 99)	
	20-30**	30-40	40-50	50-60	60-70	70+	p	<50 (n = 45)	>= 50 (n = 74)	p	<50 (n = 38)	p
LVEDVi	74.7*	77.2	78.2	66.8	66.5	62.8	<.0001	74	63	<.0001	81	<.0001
LVESVi	32.9	33.6	32.6	26.6	26.6	24.7	<.0001	30	24	<.0001	37	<.0001
LVEF	56.1	56.6	58.6	60.2	59.9	61.1	0.02	60	62	0.04	55	0.002
LVMi/EDVi	0.7	0.7	0.7	0.9	0.9	0.8	<.0001	0.7	0.9	<.0001	0.8	<.0001
SBP	113	114	114	121	122	126	<.0001	111	121	<.0001	116	0.0001

*Mean values **Age in years *Systolic blood pressure

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