

Dobutamine Stress Echocardiography in Early Diagnosis of Cardiac Disease in Childhood Cancer Survivors

Broberg O. (1), Friberg E. (1), Öra I. (2), Liuba P. (1)
 Pediatric Cardiology Lund, Sweden (1); Pediatric Oncology Lund, Sweden (2)

Introduction: Childhood cancer survivors (CCS) have significant risk for cardiovascular morbidity and mortality in part due to anthracycline (AC) cardiomyopathy which is often diagnosed late with poor response to treatment. Early diagnosis is therefore important. Dobutamine stress echocardiography (DSE) is widely used in adult individuals at risk for developing cardiac disease and could be useful for evaluating the degree of subclinical AC-cardiomyopathy in young CCS.

Methods: Eight young CCS (median age 25,1 range 22,9-30,0 years) along with 8 age-matched controls were randomly selected from an ongoing prospective study of early markers for subclinical cardiovascular disease in CCS. All had normal left ventricular ejection fraction (EF) and global longitudinal strain (GLS). DSE was performed using a previously standardized protocol with incremental doses of dobutamine from 5 µg/kg/minute (low phase) to 40µg/kg/min (max phase). GLS (%) and peak systolic strain rate (SSr, 1/s) were calculated from loops acquired in 2-, 3- and 4-chamber views at different phases and mean values were calculated.

Results: Median AC-dose was 160 (97-417) mg/m². At the maximum heart rate, CCS showed a trend toward lower GLS and SSr (p=0.06) in patients compared to controls. A significant difference between the groups was seen for SSr relative increment from rest to peak stress (p=0.03; [Table](#)).

Conclusions: In this relatively small study, young CCS with normal resting systolic function appear to have a tendency for lower GLS and SSr at maximum heart rate in comparison to controls. DSE in CCS might prove helpful in diagnosing AC cardiomyopathy at an early stage.

Table

	Group	Median	Range	P
EF(%)	CCS	61,17	55,9 – 66,4	0,20
	Control	63,35	59,5 – 67,6	
GLS(%) rest	CCS	-21,2	-20,5 – -26,8	0,16
	Control	-22,4	-20,4 - -27,3	
GLS(%) low	CCS	-26,0	-18,4 – -30,0	0,12
	Control	-28,3	-25,6 - -31,4	
GLS(%) max	CCS	-23,6	-17,3 - -28,7	0,06
	Control	-27,8	-22,1 – -30,1	
SSr(1/s) rest	CCS	-0,96	-0,43 - -1,11	0,52
	Control	-0,98	-0,69 – -1,10	
SSr(1/s) low	CCS	-1,79	-1,42 - -2,37	0,89
	Control	-1,80	-1,52 – 2,47	
SSr(1/s) max	CCS	-1,59	-1,34 – 2,45	0,06
	Control	-2,00	-1,51 – 2,24	
SSr-change rest-max(%)	CCS	80,9	42,0 – 135,8	0,03
	Control	107,9	98,9 – 138,8	