

Familial Correlation in Electrocardiographic Criteria for LVH in Israeli Families from The Kibbutz Settlements Family Study

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Background: Electrocardiographic voltage criteria of Left ventricular hypertrophy (LVH) are known risk factor for adverse cardiac events. The genetic factors determining electrocardiographic criteria of LVH were studied in an unselected population sample of 80 families residing in kibbutz settlements in Israel.

Methods: A total of 465 healthy individuals aged 15-97 from kibbutz settlements in the north of Israel were required to the study in 1992-1993. Anthropometric measurements, detailed medical questionnaire, 12 leads ECG and blood samples were taken from all participants. Measurements of QRS complex parameters were completed manually in all ECGs. Sokolow-Lyon index, Cornell voltage criteria and HLVM (electrocardiographic estimation of LV mass) were calculated. The degree of resemblance among family members was expressed by adjusted and unadjusted inter- and intraclass correlation coefficients for LVH criteria.

Results: A total of 394 ECGs were analyzed. The Mean Sokolow-Lyon index was 18.1+/-6mm, Cornell voltage criteria 13.5+/-5mm and HLVM 116.4+/-15gr. There was a significant familial aggregation of HLVM as indicated by unadjusted and adjusted inter- and intraclass correlation coefficients significantly different from zero (table1) – correlation were significant only between siblings and parent-offspring pairs, while no correlation was found in spouse-spouse.

Correlation in Sokolow-Lyon index was found only among siblings; correlation in adjusted Cornell voltage criteria was significant only in parent-offspring pairs.

Conclusions: Our preliminary results provide evidence for significant family aggregation at least for HLVM. Future complex segregation analysis will determine the pattern of genetic inheritance of electrocardiographic LVH parameters and might enable mapping of the responsible genes for LVH.

Table 1: Familial correlations for electrocardiographic LVH parameters among family members in kibbutz settlements

		Parent-offspring			Sibling-sibling			Spouse-spouse		
		n	R (SE)	p	n	R (SE)	p	n	R (SE)	p
HLVM	1	294	0.19(0.08)	0.02	123	0.41(0.1)	0.0001	105	0.168(0.1)	0.1
	2	284	0.34(0.07)	<0.0001	123	0.39(0.1)	0.0006	103	0.08(0.1)	0.47
Sokolow-Lyon	1	295	0.02(0.07)	0.8	123	0.21(0.1)	0.04	106	-0.02(0.1)	0.9
	2	284	0.04(0.07)	0.57	123	0.27(0.11)	0.01	103	-0.13(0.1)	0.2
Cornell Voltage Criteria	1	295	0.12(0.06)	0.07	123	0.1(0.1)	0.29	106	-0.05(0.1)	0.6
	2	284	0.14(0.06)	0.02	123	0.13(0.1)	0.21	103	-0.07(0.1)	0.5

1- Unadjusted familial correlation

2- Adjusted familial correlation to sex, age, BMI, BMI², blood pressure