Is excessive epicardial fat volume in asymptomatic young adult subjects with normal calcium score the trigger for abnormal ECGs and arrhythmia

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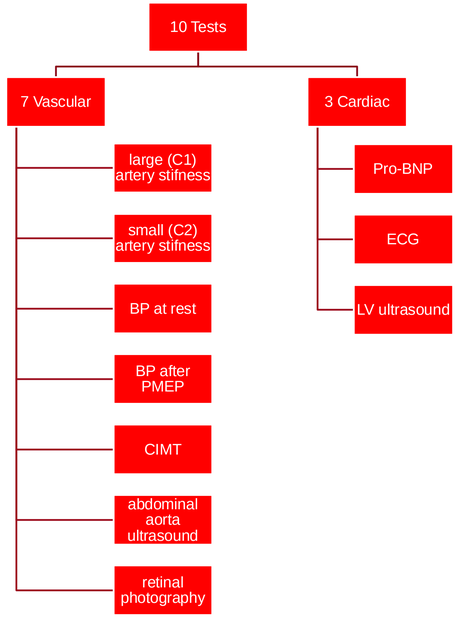
Background: Epicardial fat is the layer of adipose tissue found between the myocardium and the visceral pericardium, directly overlying the heart. Epicardial Fat Volume (EFV) has recently become regarded as a novel cardiovascular risk marker. Focusing on asymptomatic subjects allows for the study of early pathophysiological changes before the onset of symptomatic cardiovascular disease and potentially associated arrhythmias.

Purpose: To investigate whether there is an association between abnormal ECGs and excess EFV in different age groups, especially in young adults (age 35-49).

Methods: Total of 389 subjects were screened; all were 18+ and underwent CVD risk assessment using the Early Cardiovascular Disease Risk Scoring System (ESCVDRS) known as Rasmussen Risk Score (RRS) (previously reported). The ESCVDRS includes 7 vascular and 3 cardiac tests. In addition to the ESCVDRS, waist circumference was also measured. In addition, they underwent a cardiac CT to obtain CaCS and EFV determination. The 389 subjects were further categorized into 4 groups: Group1 (n. 122), Group2 (n. 64), Group3 (n. 104) and Group4 (n. 99), according to CaCS and EFV quantification (threshold CaCS > 100, EFV > 100), see Table, and further divided into 3 age groups (age 35-49, age 50-65, age 66+).



Results:
Shown in Table:

Table:

		Group1 CaS<100 EFV<100	Group2 CaS≥100 EFV<100	Group3 CaS<100 EFV≥100	Group4 CaS≥100 EFV≥100
		122 (31%)	**64 (16%)**	**104 (27%)**	**99 (25%)**
Age-35-49	**Abn C2**	6 (38%)	0 (0%)	6 (50%)	0 (0%)
	Abn PB-rise	5 (31%)	1 (100%)	8 (67%)	0 (0%)
	Abn CIMT	7 (44%)	0 (0%)	7 (58%)	0 (0%)
	Abn ECG	2 (13%)	0 (0%)	4 (33%)	0 (0%)
Age-50-65	**Abn C2**	29 (51%)	5 (38%)	28 (48%)	13 (36%)
	Abn PB-rise	22 (39%)	4 (31%)	30 (52%)	18 (50%)
	Abn CIMT	22 (39%)	3 (23%)	24 (41%)	18 (50%)
	Abn ECG	8 (14%)	2 (15%)	11 (19%)	5 (14%)
Age-66+	**Abn C2**	28 (65%)	24 (57%)	15 (52%)	18 (34%)
	Abn PB-rise	23 (53%)	22 (52%)	12 (41%)	29 (55%)
	Abn CIMT	18 (42%)	27 (64%)	12 (41%)	26 (49%)
	Abn ECG	7 (16%)	8 (19%)	9 (31%)	24 (45%)

Conclusions:

Our data highlights the condition of excessive EFV occurring prematurely than Calcium accumulation (Group3, Age 35-49).

Isolated Cardio-obesity (subjects with EFV greater than 100 and normal Calcium Score level) had significantly higher rates of abnormal ECGs in the age group 35-49 years. This may be indicative of excess EFV and may justify further evaluation leading to early treatment.

Based on our data, we recommend lifestyle modification with an emphasis on high levels of exercise along with novel treatment reported recently to decrease EFV aiming to reduce the risk of arrhythmias. Early detect to protect!