Association of leptin serum concentration with heart adipose tissue and parameters of systolic and diastolic function in heart failure patients

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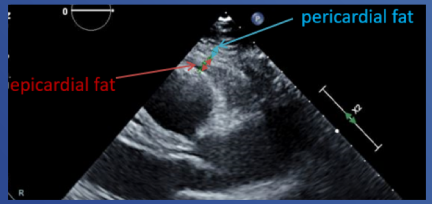
Aims

Leptin has recently been related to myocardial remodeling in animal experimentation studies on heart failure (HF). Furthermore, leptin has been reported to be related to diastolic dysfunction, however only in healthy population. With the emergence of new medical therapies targeting cardiac remodeling, there needs to be a better understanding of the metabolic pathways involving leptin. Our study aims to investigate leptin's correlation to parameters of systolic and diastolic heart function, as well as epicardial and pericardial adipose tissue (EAT and PAT) in heart failure (HF) patients.

Methods

The study included 51 patients with chronic heart failure with reduced ejection fraction (HFrEF) of ischemic (n=22) and non-ischemic (n=29) origin (NYHA II-III, mean EF 29.56 %, SD 8.1; mean BMI 28.08, SD 5.8). Serum concentrations of leptin, NT-proBNP, HbA1c, LDL, and total cholesterol were also measured. Global longitudinal strain (GLS) and other LV function parameters were assessed in transthoracic echocardiography, as well as EAT and PAT in parasternal long and short-axis views.



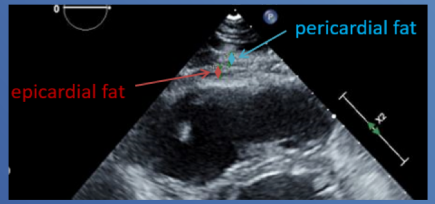


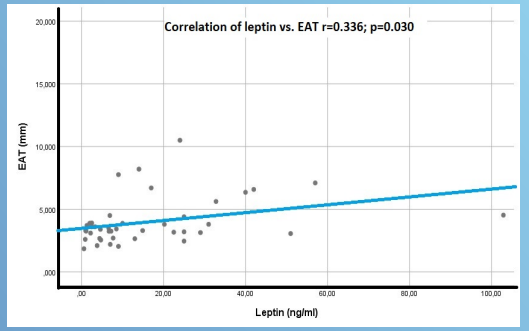
Figure 1and 2 : EAT and PAT measurement in parasternal long and short-axis views

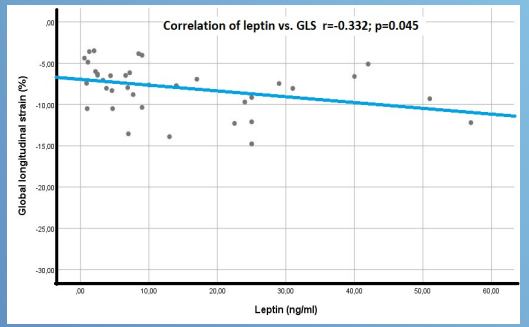
Results

We found a significant correlation between leptin serum concentration and epicardial, as well as pericardial adipose tissue (EAT r=0.336, p=0.030; PAT r=0.565, p<0.001). There was a significant negative correlation between leptin and GLS (r=-0.332; p=0.045), and a positive correlation between Leptin and E/E' ration (r=0.373; p=0.039). There was no significant difference between ischemic and non-ischemic HF patients.

	Patents, N=51
Age	61 ± 12
Male/Female	33/18
BMI	28.08 ± 5.8
NYHA II/III	53/47 %
Etiology – ischemic vs. non-ischemic origin	43/57 %
Echo	
LVEF (%)	29.56 ± 8.1
LVEDd (mm)	59.68 ± 8
Left atrial volume (ml/m²)	45 ± 19
E/E'	15.14 ± 7.9
Global longitudinal strain (%)	-7.79 ± 3.1
EAT (mm)	3.9 ± 1.8
PAT (mm)	6.5 ± 3.1
Serum measurements	
NT-pro BNP (pg/ml)	2183 ± 2380
Creatinine (mg/dl)	1.07 ± 0.33
LDL (mg/dl)	91.86 ± 34.69
Total cholesterin (mg/dl)	162 ± 46
HbA1C (%)	5.7 ± 0.7
Leptin (ng/ml)	16.6 ± 19.7
Risk factors	
Smoking	39 %
Diabetes	20 %
Family history of cardiovascular disease	27 %
Hypertension	54 %
Dyslipidemia	58 %
Atrial fibrillation	29%
Medication	
Betablockers	86 %
ACE inhibitors/ARBs	82 %
Diuretics	53 %
Aldosterone antagonists	65 %
Statins	59 %

Table 1: Clinical characteristics
Data in mean ± SD or percentages





Figures 3 and 4: Correlation between EAT and leptin and between GLS and leptin

Conclusion

We provide evidence of serum leptin correlation to remodeling parameters, as well as epicardial and pericardial fat tissue in HF patients. Whether leptin has positive effects on reversing or preventing remodeling in heart failure, needs further investigation.

* The authors declare no conflicts of interest