

ECHOCARDIOGRAPHIC EPICARDIAL FAT THICKNESS PROVIDES INFORMATION ABOUT CARDIOVASCULAR RISK IN HEMODIALYSIS PATIENTS

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Backward/Aim: Epicardial fat pad (EFP) is a visceral adipose tissue compartment surrounding the heart. It has been defined as a cardiovascular risk predictor in general population. However, its value has not been validated well in patients under hemodialysis. We investigated if EFP thickness was related with anthropometric measurements, total body fat tissue, inflammation, insulin resistance and atherosclerosis in hemodialysis patients.

Material and Method: Fifty maintenance hemodialysis patients (37 male and 13 female) were enrolled into the study. Patients with diabetes mellitus, atherosclerotic vascular disease, acute infection and/or inflammation and active or history of malignancy were excluded. Beside routine blood examinations, plasma visfatin and insulin levels, lipids, TNF- α , IL-6 and hs-CRP concentrations were evaluated. Insulin resistance was calculated according to HOMA formulation. For all patients, anthropometric measurements were noted, EFP thickness was assessed using transthoracic echocardiography, carotis intima media thickness (CIMT) using doppler ultrasonography and the fat distribution of the patients using bioimpedance analysis. The relations of EFP thickness with these parameters were assessed.

Results: The mean age was 45.8 \pm 14.6 years of age and the mean EFP thickness was 3.28 \pm 1.04 mm for our patients. There were positive correlations of EFP with body mass index (r: 0.590, p: <0.001), predialysis creatinine (r: 0.303, p: 0.032), HOMA-IR scores (r: 0.393, p: 0.005), triglyceride (r: 0.513, p: <0.001), left ventricular mass (LVM) (r: 0.426, p: 0.002), CIMT (r: 0.288, p: 0.043), fat tissue mass (FTM) (r: 0.562, p: <0.001), percent FTM (r: 0.408, p: 0.003) and negative correlations with HDL-cholesterol (r: -0.455, p: 0.001), single pool Kt/V urea (r: -0.311, p: 0.028) and percent lean tissue mass (LTM) (r: -0.421, p: 0.002). Epicardial fat pad thickness had no associations with age, inflammatory biomarkers including TNF- α , IL-6, hs-CRP and an adipokine; visfatin (for all, p > 0.05). Triglyceride/HDL-cholesterol ratio, HOMA-IR scores, LVM, spKt/V urea, BMI, FTM and percent LTM were determined as independent predictors of EFP thickness in multivariate regression models (table-1).

Conclusion: Epicardial fat pad thickness has considerable associations with well known cardiovascular risk predictors in hemodialysis patients and could be evaluated by transthoracic echocardiography which is a non-invasive, reproducible and low-priced method.

Table-1: Independent predictors for EFP in different models of multivariate regression analysis.

	Independent Variables	Beta	CI (95 %)	P
1. Model	constant:19.578, adj R ² : 0.384, p<0.001			
	TG/HDL cholesterol	3.598	(0.982, 6.214)	0.008
	LVM	0.045	(0.012, 0.077)	0.008
	1/HOMA score	-6.196	(-12.018, -0.375)	0.037
2. Model	constant:65.889, adj R ² : 0.385, p<0.001			
	TG/HDL cholesterol	3.314	(0.591, 6.038)	0.018
	Percent LTM	-36.805	(-60.060, -13.550)	0.003
	spKt/V urea	-10.360	(-19.982, -0.737)	0.035
3. Model	constant:-1.630, adj R ² : 0.393, p<0.001			
	TG/HDL cholesterol	3.201	(0.505, 5.897)	0.021
	BMI	1.232	(0.490, 1.974)	0.002
4. Model	constant:16.202, adj R ² : 0.394, p<0.001			
	TG/HDL cholesterol	3.666	(1.104, 6.229)	0.006
	FTM	0.567	(0.227, 0.908)	0.002

Multivariate linear regression analysis was performed by stepwise method. Age, gender, spKt/V urea, 1/HOMA score, LVM, TG/HDL cholesterol and CIMT were included into each model. Variables having high correlation coefficients with each other were added to the model one by one, as in following order; to the 1st model; percent FTM, to the 2nd model; percent LTM, to the 3rd model; BMI, to the 4th model; FTM. Abbreviations; TG: Triglyceride, HDL: High density lipoprotein, LVM: Left ventricular mass, HOMA: Homeostasis model assessment, LTM: Lean tissue mass, spKt/V: Single pool urea clearance index, used to represent weekly dialysis dose; where K is the clearance of urea, t is the dialysis time and V is the volume of distribution of urea, BMI: Body mass index, FTM: Fat tissue mass.

