PARAOXONASE1 AND HDL3-CHOLESTEROL LEVELS IN PATIENTS WITH CHRONIC RENAL DISEASE

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Background: Dislipoproteinemia and the decrease of the HDL-linked enzyme paraoxonase1 (PON1) contribute to atherosclerosis in chronic kidney disease (CKD) patients. This study intends to examine the association between lipid profile and serum PON1 levels in renal failure (RF) and hemodialysis (HD) patients

Methods: We studied ninety patients with CKD divided into groups RF (n=46) and HD (n=44), and thirty normal individuals (control group). Serum HDL2 and HDL3-C subclasses of HDL-C were isolated by a single-step precipitation method and PON1 concentration was measured by ELISA.

Table 1. Demographic characteristics of patients and controls * p<0.01 vs. Controls, ** p<0.001 vs. Controls, *** p<0.001 vs. RF patients

	Controls	RF patients	HD patients
Age, years	57±33	60±20	68±12
Sex (male/female)	14/16	26/20	24/20
BMI, kg/m^2	23.5±1.0	24.0±1.8	24.4±1.1
Duration of HD, months	-	-	84±113
Statin treatment (n %)	39	35	40
Creatinine, mg/dl	0.77±0.18	2.05±1.30*	9.24±2.57**,***
Urea, mg/dl	30±8	76±40**	144±35**,***
Albumin, g/dl	4.56±0.27	4.15±0.36**	4.13±0.35**

Table 2. Lipid profile and PON1 concentration in patients and controls* p<0.01 vs. NC, ** p<0.05 vs. RF, *** p<0.001 vs. NC, **** p<0.001 vs. RF, ***** p<0.05 vs. NC

	Controls	RF patients	HD patients
Total Cholesterol, mg/dl	186±25	182±35	162±34*,**
Triglycerides, mg/dl	78±28	119±58*	138±63***
LDL-C, mg/dl	100±33	113±34	85±30****
HDL-C, mg/dl	69±18	58±16*	43±14***,****
HDL2-C, mg/dl	36±17	32±12*****	25±11*
HDL3-C, mg/dl	33±5	26±2***	18±4***,****
Apo A1, mg/dl	168±25	147±24*****	138±40***
Apo B, mg/dl	82±22	97±27	78±27**
PON1, μg/ml	53.42±12.50	46.30±19.55	25.94±12.79***,****

Table 3. Lipid profile and PON1 concentration in CKD patients without (w/o) and with statins*p<0.05 vs. RF without statins, ** p<0.001 vs. RF without statins, *** p<0.05 vs. RF with statins,
**** p<0.001 vs. RF with statins, ***** p<0.001 HD without statins

	RF patients w/o statins	with statins	**HD patients** w/o statins	with statins
Cholesterol, mg/dl	190±38	174±32	164±32*	160±20*
Triglycerides, mg/dl	125±55	113±33	140±72	136±28
LDL-C, mg/dl	118±34	107±30	84±26**	86±19*
HDL-C, mg/dl	55±18	62±15	44±15***	42±4***
HDL2-C, mg/dl	30±12	33±13	29±15	21±7
HDL3-C, mg/dl	22±3	28±3**	14±2**,****	20±3****,*****
Apo A1, mg/dl	138±22	159±26	135±27***	140±52***
Apo B, mg/dl	101±26	89±26	75±21*	80±21
PON1, μg/ml	39.48±9.62	49.31±14.94	24.22±12.44**,****	30.42±12.62****

Fig. 1 Comparison of serum PO. N1 levels in RF and HD patients with (w) or without (w/o) statin treatment
* p<0.001 vs. RF without statins and RF with statins, **p<0.001 vs. RF with statins.

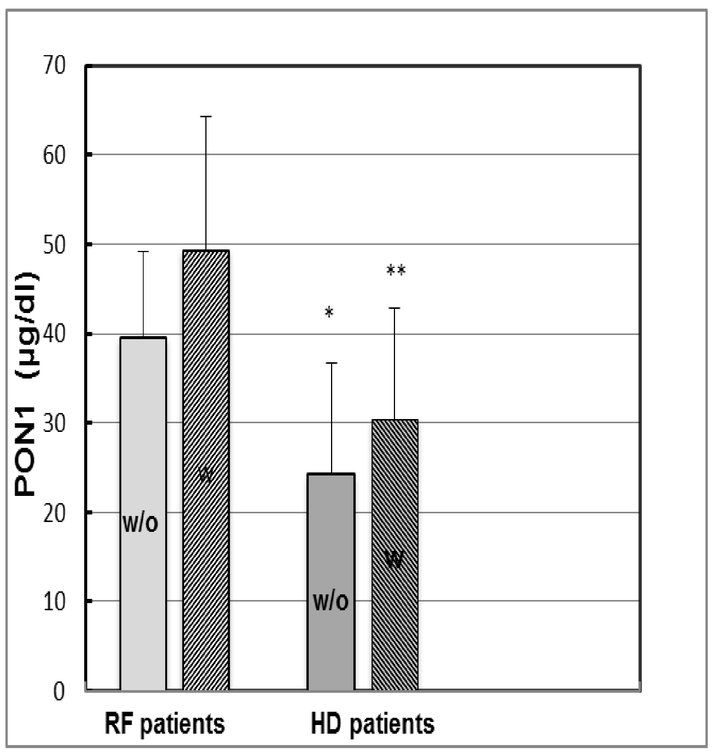

Table 4. Linear regression analysis between serum PON1 concentration, lipids and apolipoproteins in CKD patients

	RF patients		**HD patients**	
	r	p	r	p
Cholesterol	-0.167	0.377	-0.205	0.259
Triglycerides	-0.107	0.612	-0.121	0.531
LDL-C	-0.213	0.266	-0.423	0.014
HDL-C	0.462	0.040	0.471	0.013
HDL2-C	0.122	0.536	0.219	0.220
HDL3-C	0.480	0.032	0.490	0.010
Apo A1	0.468	0.028	0.399	0.032
Apo B	-0.166	0.389	-0.205	0.269

Table 5.Multiple regression analysis of lipid–associated factors influencing serum PON1 concentration of CKD patients

Independent variable	**RF patients** β	p	**HD patients** β	p
HDL-C	0.115	0.699	0.360	0.604
HDL3-C	0.332	0.010	0.236	0.812
Apo-A1	0.298	0.026	0.384	0.158
LDL-C	-0.105	0.277	-0.331	0.026
Statins	0.052	0.268	0.344	0.020

R^2=0.395, F=2.746, p=0.046 for RF model.
R^2=0.503, F=3.447, p=0.025 for HD model

Conclusions: Different parameters of lipid profile are determinants of PON1 concentration in CKD groups. In HD patients, statin therapy may be associated with higher PON1 levels. This may probably contribute to the delay of atherosclerosis in those patients.

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