

Relationship of cystatin C with Cardiovascular risk factors and inflammatory markers in Hemodialysis

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Abstract (Click on the text to edit)

Cystatin C was reported as a predictive factor for cardiovascular disease in chronic kidney disease(CKD) patients. In a study for non-dialysis CKD patients, cardio-ankle pulse wave velocity (ca-PWV) is significant related with cystatin C and in other studies for general population or non-dialysis CKD patients, it was reported that cystatin C is a significant predictive factor for cardiovascular(CV) risk irrespective of glomerular filtration rate. The purpose of this study was to evaluate the relationship of serum cystatin C with CV risk factors, inflammatory marker in the HD patients.

Objectives

The purpose of this study was to evaluate the relationship of serum cystatin C with CV risk factors, inflammatory marker in the HD patients.

baseline characteristics

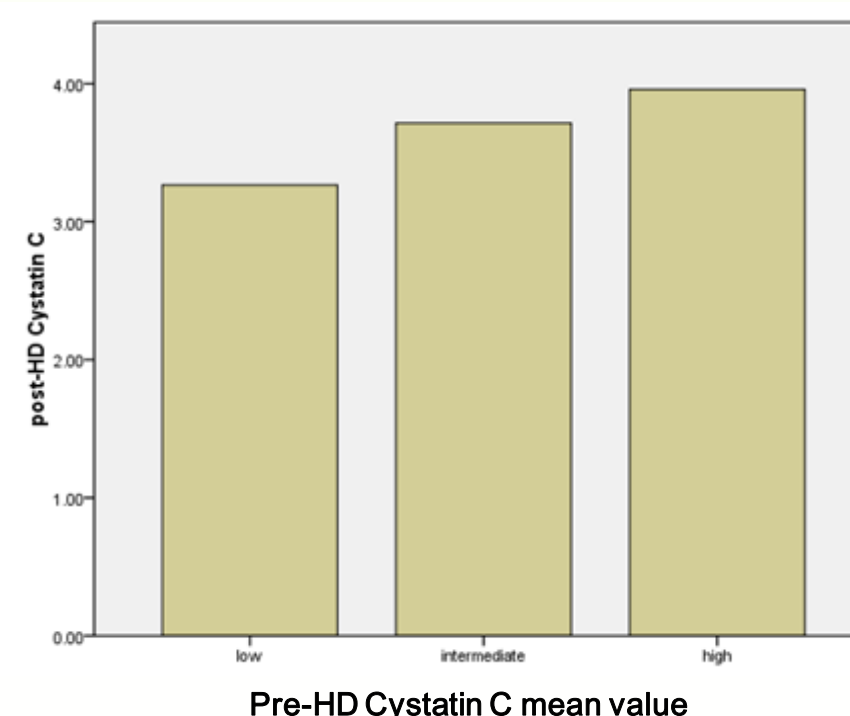
	Quintile 1 ($<6.486\text{mg/dl}$)	Quintile 2 ($\geq 6.486\text{mg/dl}$, $<7.41\text{mg/dl}$)	Quintile 3 ($\geq 7.41\text{mg/dl}$)	P value
No. patients	18	18	9	
Age-yr	57 ± 10	57 ± 12	48 ± 15	0.238
Male sex- no.(%)	10(57)	10(57)	4(48)	0.401
Diabetes- no.(%)	9 (50)	7(39)	3(33)	0.670
Hypertension- no.(%)	16(83)	18(89)	9(100)	0.438
History of CHD- no.(%)	3(17)	7(39)	1(11)	0.182
History of CVD- no.(%)	3(17)	3(17)	3(33)	0.543
History of CHF- no.(%)	3(17)	2(11)	2(22)	0.749
History of PVD- no.(%)	0(0)	3(22)	0(0)	0.040
Current smoker- no.(%)	0(0)	1(6)	0(0)	0.472
ARB, ACEi medication - no.(%)	14(72)	11(61)	5(56)	0.653
Beta blocker medication- no.(%)	7(39)	10(56)	4(44)	0.605
BMI - mean \pm SD	22 ± 2	22 ± 2	22 ± 2	0.843
Systolic BP (mmHg) - mean \pm SD	160 ± 11	150 ± 28	160 ± 24	0.240
Diastolic BP(mmHg) - mean \pm SD	72 ± 14	72 ± 14	86 ± 14	0.033
URR (%)- mean \pm SD	71 ± 4	76 ± 6	71 ± 5	0.065
TG(mg/dl)- mean \pm SD	121 ± 99	93 ± 46	103 ± 55	0.957
HDL (mg/dl)- mean \pm SD	45 ± 16	41 ± 12	37 ± 7	0.541
LDL(mg/dl)- mean \pm SD	61 ± 20	60 ± 22	63 ± 27	0.965
PTH- mean \pm SD	158 ± 189	176 ± 225	279 ± 275	0.589

Methods

This study is a cross sectional study and we enrolled 45 HD patients. We measured CRP, TNF-alpha, IL-6, urea reduction rate(URR), lipid profile, insulin and glucose before HD, pre- and post-HD cystatin C. The ca-PWV reflecting for the degree of atherosclerosis was performed within 1 month. By the assessment of these laboratory data and review of medical records, we calculated Framingham risk score for cardiovascular disease and homeostasis model assessment-estimated insulin resistance(HOMA-IR). We measured the serum pre- and post-HD cystatin C after 1 month, and categorized three groups by measuring the average with initial value.

comparison of CV risk factors among Cystatin C groups

	Quintile 1	Quintile 2	Quintile 3	P-value
CRP(mg/dl)	0.36 ± 0.63	0.09 ± 0.10	0.24 ± 0.40	0.110
IL-6 (pg/ml)	2.87 ± 2.36	4.40 ± 2.87	4.85 ± 3.20	0.738
TNF-a (pg/ml)	4.02 ± 6.28	2.06 ± 0.47	5.66 ± 8.56	0.491
R-CAVI	8.37 ± 1.67	8.73 ± 0.74	8.34 ± 1.49	0.596
L-CAVI	8.11 ± 1.37	8.85 ± 0.92	8.15 ± 1.72	0.164
R-ABI	1.12 ± 0.11	1.15 ± 0.23	1.09 ± 0.07	0.445
L-ABI	1.13 ± 0.12	1.07 ± 0.11	1.06 ± 0.09	0.146
Framingham risk score(10-yr CHD risk)-%	10.22 ± 6.38	10.83 ± 7.71	10.78 ± 8.94	0.952



Results

the average of cystatin C before HD was $6.57 \pm 1.02\text{mg/L}$, and we categorized three groups by Low ($<6.49\text{mg/L}$; $n=18$), intermediate ($\geq 6.49\text{mg/L}$, $<7.41\text{mg/L}$; $n=18$), high ($\geq 7.41\text{mg/L}$; $n=9$) according to cystatin C level. In these groups, there is no difference in age, body mass index(BMI), lipid profile, PWV, inflammatory factor, Framingham risk score and HOMA-IR. In relationship between serum cystatin C and CV risk factor, there was not associated with PW, IL-6, TNF-a, CRP, Framingham risk score and HOMA-IR. In assessment of the relationship between in vivo production of cystatin C and CV risk factor, there was not significant associated with the difference in pre- and post-HD cystatin C. There was significant correlation between pre- and post-HD cystatin C (coefficient=0.319, $p=0.014$) and this value has strong correlation after correction of difference in dialysis membrane. (coefficient=0.596, $p<0.001$). It assumes that dialysis membrane affect the concentration of cystatin C after HD. There is not significant correlation with URR and cystatin C reduction rate($p=0.221$).

Conclusions

the serum cystatin C was not associated with traditional CV risk factor and inflammatory factors in HD patients.

References

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