ENDOTHELIAL GLYCOCALYX DAMAGE AND RENAL DYSFUNCTION IN HIV PATIENTS RECEIVING COMBINED ANTIRETROVIRAL THERAPY

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Introduction and Aims

Both HIV infection and kidney diseases are associated with endothelial dysfunction and accelerated cardiovascular events. HIV patients receiving combined antiretroviral therapy (cART) may have endothelial dysfunction with subsequent hypertension and atherosclerosis. The aim of this study was to investigate endothelial damage in HIV patients receiving cART, through glycocalyx injury biomarkers.

Methods

This is a cross-sectional study of HIV-infected patients recruited from public health centers in Fortaleza city, Northeast of Brazil between January and December 2015. Three groups of HIV patients were included: 1) those who never received cART, 2) HIV patients receiving cART containing tenofovir/lamivudine/efavirenz, and 3) zidovudine/lamivudine/efavirenz. Also, a group of 13 healthy subjects were included as a control group. Endothelial biomarkers were measured in specific serum samples aliquots by ELISA kits: ICAM-1 (ELISA set ab47349; Abcam, Cambridge, MA, USA) and syndecan-1 as a biomarker of endothelial glycocalix injury (ELISA set ab47352; Abcam, Cambridge, MA, USA).

Results

Table 1. Clinical characteristics of healthy control and HIV-infected patients according to cART use.

	Control (n=13)	No cART (n=18)	cART/Tenofovir (n=27)	cART/Zidovudine (n=21)	P value
Age	29±5	32±8	33±8	35±10	0.261[c]
Male Gender	7(12)	11(19)	21(36.7)	19(33.3)	0.062[a]
Treatment time (months)	-	-	14±7.5	23±7.8	<0.0001[b]
BMI (Kg/m²)	22.5±1.7	25.2±4.1	24.5±2.3	23.3±3.7	0.077[c]
Blood pressure					
Systolic BP (mm Hg)	109.2±11.1	112.2±9.4	113.7±11.5	110.9±10	0.618[c]
Diastolic BP (mm Hg)	71.5±8	77.2±10.7	78.5±7.7	74.7±6	0.070[c]
Waist circumference (cm)	80±7	87±7	86±20	87±10	0.199[c]
Glucose (mg/dL)	84.2±8	80.7±8.1	75.6±10*	81±9.2	0.04[c]
Albumin (g/dL)	4.63±0.2	4.44±0.5	4.18±0.6	4.43±0.4	0.053[c]
Triglycerides (mg/dL)	89.6±28	109.5±63	118.6±57	141±72	0.109[c]
Total Cholesterol (mg/dL)	167±34	164±45	182±47	182±42	0.422[c]

Data are presented as the mean ± standard deviation or as an absolute number with percentage in parenthesis. BMI: body mass index. * $p < 0.05$ compared with control group. [a] Chi-square test. [b] Student's t-test. [c] One-way ANOVA.

Table 2. Renal parameters and levels of endothelial biomarkers in HIV-infected patients according to cART use and comparison with control group.

	Control (n=13)	No cART (n=18)	cART/Tenofovir (n=27)	cART/Zidovudine (n=21)	P value
Renal parameters					
sCreatinine (mg/dL)	0.57±0.2	0.60±0.13	0.63±0.2	0.63±0.14	0.704[a]
sUrea (mg/dL)	24.7±5.3	25±6.2	23±7.6	24.5±6	0.741[a]
eGFR (mL/min/1.73²)	166±67	140±32	140±41	138±36	0.274[a]
Endothelial biomarkers					
ICAM-1 (ng/mL)	668.7±162	806.7±447	806.5±598	716.1±334	0.757[a]
Syndecan-1 (ng/mL)	35.4±12.9	61.8±19.9	80.1±27.9*	76.7±24.8*	<0.001[a]

Data are presented as the mean ± standard deviation. eGFR, estimated glomeular filtration rate using MDRD Equation. [a] One-way ANOVA. * Compared with control group. Significant $p < 0.05$.

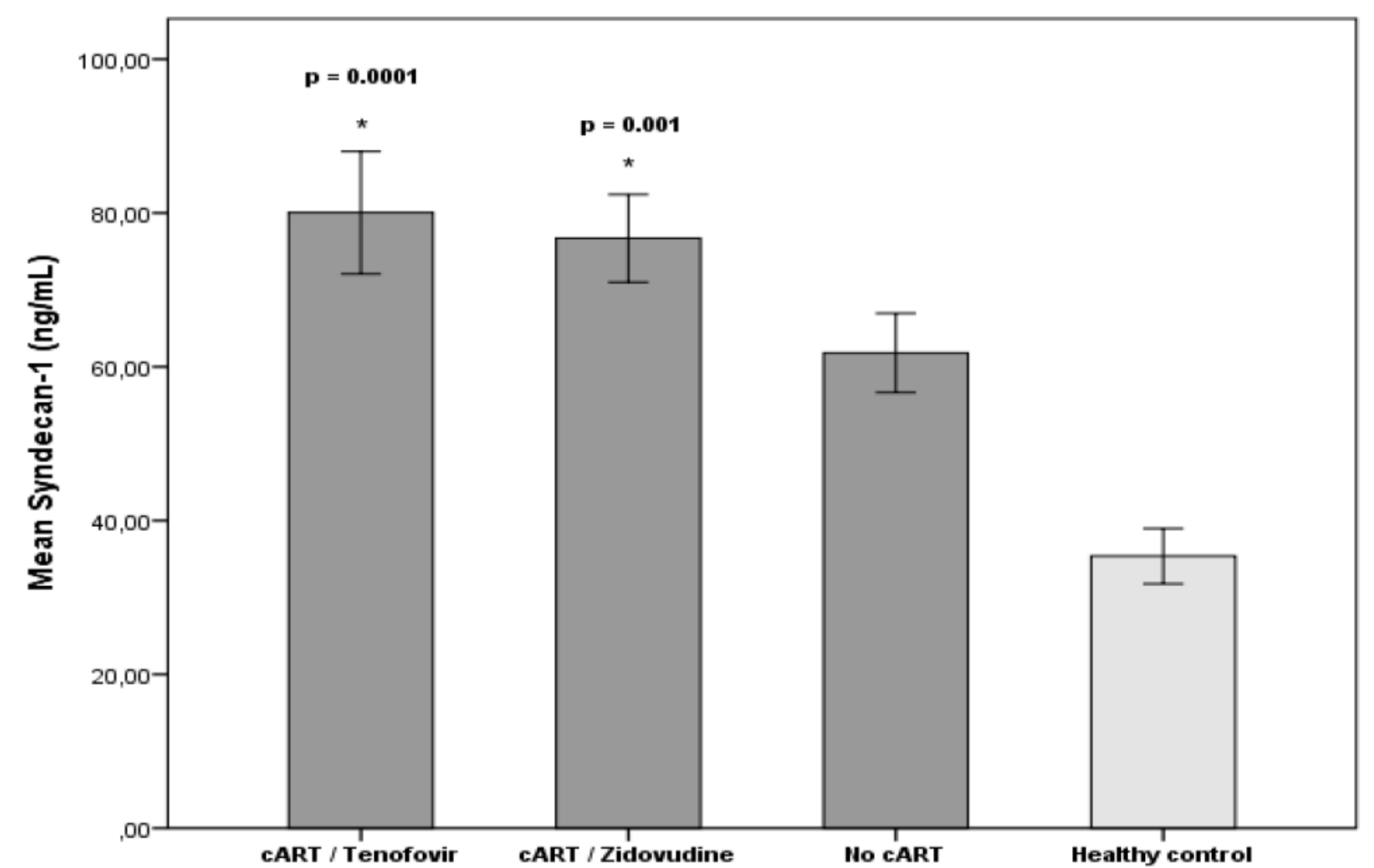Figure 1. Endothelial glycocalyx damage according each groups

Table 3. Pearson correlations values between renal and endothelial biomarkers.

	Syndecan-1		ICAM-1	
	r	p	r	p
Serum Creatinine	0.437	0.001*	- 0.073	0.565
Serum Urea	0.352	0.006*	-0.217	0.085
eGFR (MDRD)	-0.251	0.056	0.058	0.661
uPCR	-0.038	0.776	0.252	0.055

Conclusions

In HIV patients in chronic use of cART with apparently no renal and cardiovascular disease it was observed elevated levels of syndecan-1, signaling subclinical endothelial injury and it is associated with clinical biomarkers of kidney dysfunction.

References

1. Rosenberg AZ, Naicker S, Winkler C a., Kopp JB. HIV-associated nephropathies: epidemiology, pathology, mechanisms and treatment. Nat Rev Nephrol. Nature Publishing Group; 2015
2. Hemkens LG, Bucher HC. HIV infection and cardiovascular disease. Eur. Heart J. 2014. p. 1373–1381.
3. Fisher SD, Miller TL, Lipshultz SE. Impact of HIV and highly active antiretroviral therapy on leukocyte adhesion molecules, arterial inflammation, dyslipidemia, and atherosclerosis. Atherosclerosis. 2006; 185(1):1–11.
4. Neves FMDO, Meneses GC, Sousa NEA, et al. Syndecan-1 in Acute Decompensated Heart Failure – Association With Renal Function and Mortality –. Circ J. 2015.

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