TUBULOGLOMERULAR EVALUATION IN VISCERAL LEISHMANIASIS BEFORE AND AFTER TREATMENT WITH PENTAVALENT ANTIMONIAL

Michelle J. C. Oliveira[1,2], Geraldo B. Silva Junior[1,2], Aline Sampaio[1], Bárbara Montenegro[1], Marília P. Alves[1], Guilherme A. L. Henn[5], Hermano A. L. Rocha[1] Gdayllon C. Meneses[3], Alice M.C. Martins[3], Talita R. Sanches[4], Lúcia C. Andrade[4], Antonio C. Seguro[4], Alexandre B. Libório[1], Elizabeth F. Daher[1]

[1]Post-Graduation Program in Medical Sciences, Department of Internal Medicine, School of Medicine, Federal University of Ceará, Fortaleza, Ceará, Brazil; [2]School of Medicine, Health Sciences Center, University of Fortaleza, Fortaleza, Ceará, Brazil; [3]Department of Clinical and Toxicological Analysis, School of Pharmacy, Federal University of Ceará. Fortaleza, Ceará, Brazil; [4]Division of Nephrology, School of Medicine, University of São Paulo. São Paulo, Brazil; [5]São José Infectious Disease Hospital. Fortaleza, Brazil.

OBJECTIVES

Visceral leishmaniasis (VL) is an endemic disease in tropical countries which can complicate with kidney injury. The aim of this study is to investigate abnormalities in glomerular and tubular function in VL patients before and after specific treatment.

METHODS

This is a prospective study with 16 VL adult patients before treatment with pentavalent antimonial. Urinary concentration and acidification tests were performed. Glomerular filtration rate (GFR), fractional excretion of sodium (FE_{Na}), transtubular potassium gradient (TTKG) and solute free water reabsorption (TcH_2O) were calculated. Monocyte chemotactic protein-1 (MCP-1) urine excretion was also measured. The VL group pre-treatment was compared to a group of 13 healthy volunteers and 5 VL patients were re-evaluated after treatment. Aquaporin 2 (AQP2) was also quantified trough exosomes search in urine.

RESULTS

Urinary concentration deficit was found in all VL patients before (100%) and 4 (80%) after treatment. Urinary acidification deficit was found in 9 cases before (56.2%) and 2 (40%) after treatment, considering urinary pH > 5.5 after $CaCl_2$ test. GRF was similar between the groups. Proteinuria was significantly higher in VL patients pre-treatment (250.6±375.5 *vs.* 83.7±49.2mg/24h, *p*=0.022) and presented important regression after re-evaluation (268.1±259.4 vs. 113.3±50.1, p=0.043). FE_{Na} was higher in VL group and TTKG and T_CH_2O did not show significant statistical differences between VL patients and control group, as well as the search for AQP2 (128±88 vs.100±40, *p*=0.41). Urinary MCP-1 levels were higher among VL patients than in controls (374±359 vs. 42±29mg/g creatinine, p=0.002).

Table 1: Comparison of renal function parameters between patients with VL before and after treatment.

	VL group (before treatment) N=5	VL group (after treatment) N=5	P
P_{Cr} (mg/dL)	1,1±0,1	1,1±0,2	0,414
GFR- CKD-EPI (mL/min/1,73m-^{2})	82,4±12,2	83,1±22,7	0,593
Proteinuria (mg/day)	268,1±259,4	113,3±50,1	0,043
Microalbuminuria (mg/day)	14,5±14,0	8,1±8,9	0,465
Urine output (mL/day)	1803±1068	1263±583	0,043

Table 2. Comparison of concentration and acidification test results between patients with VL before treatment and controls.

	VL group (before treatment) N=16	Control group N=13	P
U_{Osm} T_0 (mOsm/Kg)	478±107	744±182	<0,001
U_{Osm} T_4 (mOsm/Kg)	516±113	743±189	<0,001
U_{Osm}/ P_{Osm} T_0	1,63±0,37	2,60±0,67	<0,001
U_{Osm}/ P_{Osm} T_4	1,78±0,40	2,54±0,63	0,001
pH- venous T_0	7,37±0,05	7,39±0,05	0,508
pH - venous T_4	7,36±0,05	7,35±0,05	0,932
HCO_3 T_0 (mEq/L)	22,0±2,0	29,0±4,0	<0,001
HCO_3 T_4 (mEq/L)	21,0±2,0	26,0±1,0	<0,001
U_{pH} T_0	5,99±0,94	5,55±0,54	0,149
U_{pH} T_4	5,71±0,84	5,08±0,43	0,018

Table 3. Comparison of concentration and acidification test results between patients with VL before and after treatment.

	VL group (before treatment) N=5	VL group (after treatment) N=5	P
U_{Osm} T_0 (mOsm/L)	518±51	557±69	0,500
U_{Osm} T_4 (mOsm/L)	581±84	622±89	0,686
U_{Osm}/ P_{Osm} T_0	1,77±0,24	1,90±0,25	0,500
U_{Osm}/ P_{Osm} T_4	1,96±0,27	2,14±0,31	0,345
pH venous T_0	7,35±0,05	7,38±0,02	0,593
pH venous T_4	7,33±0,04	7,35±0,02	0,593
HCO_3 T_0 (mEq/L)	20,0±2,0	27,0±1,0	0,109
HCO_3 T_4 (mEq/L)	21,0±3,0	25,0±2,0	0,068
U_{pH} T_0	5,54±0,42	5,49±0,32	0,684
U_{pH} T_4	5,61±0,55	5,25±0,53	0,715

CONCLUSION

VL patients present urinary concentration and acidification deficit, which persisted in some cases after specific treatment. They also present significant proteinuria, evidencing glomerular injury and high FE_{Na}, suggesting possible proximal tubule damage. MCP-1 is increased in VL patients, constituting a new kidney dysfunction biomarker in VL, which points to the occurrence of subclinical renal inflammation.

REFERENCES

1. da Silva Junior GB, Guardão Barros EJ, de Francesco Daher E. Kidney involvement in leishmaniasis – a review. Braz J Infect Dis 2014 Mar 29. pii: S1413-8670(14)00058-0. doi: 10.1016/j.bjid.2013.11.013. [Epub ahead of print].
2. Oliveira MJC, Silva Junior GB, Abreu KL *et al*. Risk Factors for acute kidney injury in visceral leishmaniasis (Kala-Azar). Am J Trop Med Hyg 2010; 82: 449-453.
3. Daher EF, Rocha NA, Oliveira MJ et al. Renal function improvement with pentavalent antimonial agents in patients with visceral leishmaniasis. Am J Nephrol 2011; 33: 332-336.

E-mail: geraldobezerrajr@yahoo.com.br, efdaher@uol.com.br

DOI: 10.3252/pso.eu.51era.2014

Poster presented at: 51 ERA-EDTA CONGRESS AMSTERDAM THE NETHERLANDS MAY 31 JUNE 3 2014

PosterSessionOnline.com