www.nephropathol.com DOI: 10.34172/jnp.2022.18391 J Nephropathol. 2022;x(x):e18391

Journal of Nephropathology

Chronic dehydration-related nephropathy; an under-recognized cause of renal failure in tropics

Dorsa Jahangiri[1], Mohammadreza Ardalan[2*], Muhammed Mubarak[3], Shahrzad Alimohammadi[4,5], Hamid Reza Jahantigh[6,7], Sanam Saeifar[8], Yeganeh Ragati Haghi[9]

[1]Independent Researcher, 43185 Cardston Place Leesburg Virginia, 20176, USA
[2]Kidney Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
[3]JIK Department of Histopathology, Sindh Institute of Urology and Transplantation, Karachi, Pakistan
[4]Doctoral School of Molecular Medicine, University of Debrecen, Debrecen, Hungary
[5]Department of Immunology, Faculty of Medicine, University of Debrecen, Debrecen, Hungary
[6]Interdisciplinary Department of Medicine, Section of Occupational Medicine, University of Bari, Bari, Italy
[7]Animal Health and Zoonosis PhD Course, Department of Veterinary Medicine, University of Bari, Bari, Italy
[8]Buchmann Institute for Molecular Life Sciences (BMLS), Cluster of Excellence Frankfurt Macromolecular Complexes (CEF-MC), Goethe University Frankfurt am Main, Frankfurt am Main, Germany
[9]Department of Pharmacy, Bridgeport Hospital, Connecticut, USA

ARTICLE INFO

Article type:
Photonephropathology

Article history:
Received: 2 July 2022
Accepted: 21 August 2022
Published online: 18 September 2022

Keywords:
Chronic dehydration
nephropathy

Implication for health policy/practice/research/medical education:
This article reports a persistent dehydrated case with mild proteiunuria due to tubulointerstitial involvement that suddenly failed his renal function and underwent peritoneal dialysis.

Please cite this paper as: Jahangiri D, Ardalan M, Mubarak M, Alimohammadi S, Jahantigh HR, Saeifar S, Ragati Haghi Y. Chronic dehydration-related nephropathy; an under-recognized cause of renal failure in tropics. J Nephropathol. 2022;x(x):e18391. DOI: 10.34172/jnp.2022.18391.

Photonephropathology

A 43-year-old male was admitted to the hospital due to vomiting and oliguria. He was well until seven days ago when he began to develop a headache and then he gradually developed nausea. His plasma creatinine was 6.5 mg/dL. Urinalysis showed mild proteinuria without hematuria and leukocytes. No kidney diseases were documented in his past medical history or family history. His kidney function worsened gradually, then he directed toward peritoneal dialysis. The patient was a wild-life protectionist for 12 years and had normal kidney function during the annual health checkups until last year. He had a routine exercise schedule including regular long-distance walking in warm temperatures for several years, and his physical activity was intensified during the past few months. Although he experienced increase in sweating, he insisted on "not drinking water" during his walking and climbing exercises aimed for improvement of his physical stamina in trainings.

His renal biopsy showed involvement of tubulo-interstitial compartment with dilated tubules filled with casts alternating with small atrophic tubules with marked interstitial fibrosis in the background (Figure 1). The glomeruli and blood vessels were largely unremarkable. Immunofluorescence findings was also unremarkable. Considering the repeated dehydration episodes without drinking sufficient fluid, chronic dehydration-related kidney disease could be considered in this case. This is similar to the cases observed among young male workers engaged in sugarcane cultivation in Central America and it was later reported in other types of agriculture activities in hot climates. Affected individuals were asymptomatic, with normal or slightly elevated blood pressure coupled with mild proteinuria and inactive urine sediments. Like our patient (Figure 2), their renal biopsies showed chronic

*Corresponding author: Prof. Mohammadreza Ardalan,
Email: ardalanm@tbzmed.ac.ir, ardalan34@yahoo.com

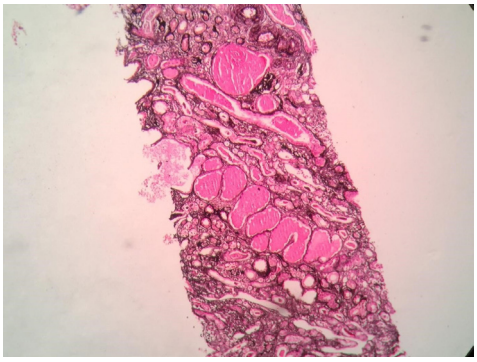

Figure 1. A representative area of renal biopsy showing dilated tubules filled with casts alternating with stripes of small atrophic tubules and marked interstitial fibrosis in the background. A few small arteries are stained in the upper part of the field and are unremarkable (Jones' stain ×100).

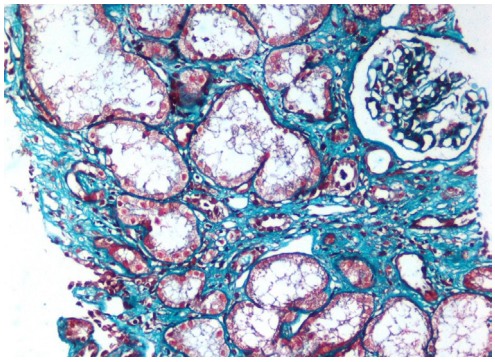

Figure 2. A representative area of renal biopsy showing normal glomerulus. There is moderate tubular atrophy and interstitial fibrosis with a few interstitial inflammation in the background (Trichrome stain ×200).

tubulointerstitial involvement with tubular atrophy and fibrosis (1-3).

Authors' contribution

Conceptualization: MA, Methodology: MM, ShA & HRJ, Validation: DJ, Formal Analysis: MM, Investigation: MA, Resources: DJ & SS, Data Curation: DJ & SS, Writing—Original Draft Preparation: MA & SS, Writing—Review and Editing: DJ & SS, Visualization: DJ & SS, Supervision: MA, Project Administration: MA.

Conflicts of interest

The authors declare that they have no conflicts of interest

Ethical issues

Ethical issues (including plagiarism, data fabrication, and double publication) have been completely observed by the authors.

Funding/Support

None.

References

1. Johnson RJ, Wesseling C, Newman LS. Chronic kidney disease of unknown cause in agricultural communities. N Engl J Med. 2019;380:1843-52.
2. Mansour SG, Verma G, Pata RW, Martin TG, Perazella MA, Parikh CR. Kidney injury and repair biomarkers in Marathon runners. Am J Kidney Dis. 2017;70:252–61.
3. Yang X, Wu H, Li H. Dehydration-associated chronic kidney disease: a novel case of kidney failure in China. BMC Nephrol. 2020 May 4;21:159. doi: 10.1186/s12882-020-01804-x.