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

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This article reports a persistent dehydrated case with mild proteinuria due to tubulointerstitial involvement that suddenly failed his renal function and underwent peritoneal dialysis.

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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 tubulointerstitial 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

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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 $\times 100$).

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

Authors' contribution

Conceptualization: MA.

Methodology: MM, ShA and HRJ.

Validation: DJ.

Formal analysis: MM.

Investigation: MA.

Resources: DJ and SS.

Data curation: DJ and SS.

Writing—original draft preparation: MA and SS.

Writing—review and editing: DJ and SS.

Visualization: DJ and SS.

Supervision: MA.

Project administration: MA.

Conflicts of interest

The authors declare that they have no conflicts of interest.

Ethical issues

This photonephropathology was conducted in accord with

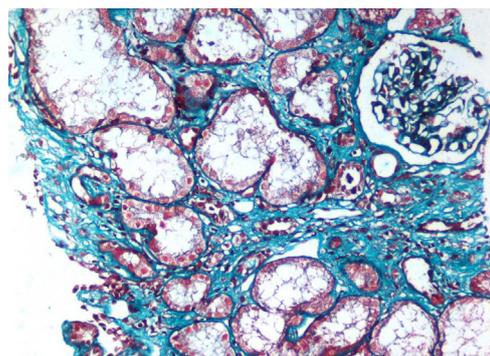


Figure 2. A representative area of renal biopsy showing normal glomerulus. There is moderate tubular atrophy and interstitial fibrosis with a few interstitial inflammation in the background (Trichrome stain $\times 200$).

the World Medical Association Declaration of Helsinki. The patient has given us a written informed consent for publication as a photonephropathology. Besides, ethical issues (including plagiarism, data fabrication and double publication) have been completely observed by the authors.

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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.

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