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## Editorial:

### OCHRATOXINS INDUCE MESOAMERICAN NEPHROPATHY?

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Mesoamerican nephropathy (MN) is a form of chronic nephropathy of unknown etiology originally described in Central America, where this condition is a major cause of morbidity and mortality<sup>1</sup>. MN is suspected to be a multifactorial disease, and several factors have been proposed, including heat stress (severe dehydration), excessive physical work (rhabdomyolysis), environmental toxins (agrichemicals, heavy metals, aristoloquic acid), infections (leptospirosis, hantavirus), nephrotoxic medications (NSAIDs), and a genetic predisposition (family compromise) to this nephropathy<sup>1-3</sup>.

This nephropathy has mainly been found in workers who perform strenuous physical labor in hot and humid conditions, such as sugarcane workers, construction workers, miners, and port workers. It has been proposed that work-related acute kidney injury episodes could be "subclinical", with the accumulation of many such episodes

over time leading gradually to a chronic kidney disease (CKD)<sup>1</sup>.

MN is characterized as a tubule-interstitial CKD which usually presents anemia, low serum electrolytes levels (hyponatremia, hypokalemia, hypomagnesemia), hyperuricemia, aseptic dysuria (uric acid crystaluria), and slightly altered urinalysis.

Even though, heat stress in a context of hard physical work and their deleterious renal consequences seem to be the main MN inducing mechanism, its exact pathophysiologic mechanism is not completely understood yet<sup>3</sup>.

Regarding other etiopathogenic hypotheses such as the association of this disease with the exposure to pesticides or heavy metals, it has not been demonstrated either by field studies or histopathological analysis. Moreover, hypotheses such as the intake of low-quality alcoholic beverages and / or NSAIDs, as well as the exposure to infections have no evidence to support them<sup>3</sup>.

Ochratoxins are a sort of mycotoxins produced mainly by the *Aspergillus ochraceus* and *Penicillium verrucosum* whose growth is favored in tropical and subtropical weathers (hot and wet), respectively. These mycotoxins are present in a wide variety of foods and their byproducts, and even though they are mainly incorporated by oral via, they can also be inhaled. Ochratoxins can induce nephrotoxicity related to different clinical syndromes including tubule-interstitial damage or Balkan nephropathy. Since fungal species which produce ochratoxins have also been documented polluting food of plant origin and alcoholic beverages in Central American coastal region, it could be hypothesized that these mycotoxins could be one of the causes of MN<sup>4-5</sup>.

In conclusion, in this letter we originally propose that ochratoxins should be taken into account as a potential cause or concause of Mesoamerican nephropathy.

## REFERENCES

- 1.- Kupferman J, Ramírez-Rubio O, Amador JJ, López-Pilarte D, Wilker EH, Laws RL, Sennett C, Robles NV, Lau JL, Salinas AJ, Kaufman JS, Weiner DE, Scammell MK, McClean MD, Brooks DR, Friedman DJ. Acute Kidney Injury

in Sugarcane Workers at Risk for Mesoamerican Nephropathy. *Am J Kidney Dis.* 2018;72(4):475-482.

2) Correa-Rotter R, García-Trabanino R. [Mesoamerican nephropathy: a new chronic kidney disease of high local relevance]. *Acta Médica Grupo Ángeles.* 2018; 16(1):S16-S22

3) Fischer RSB, Vangala C, Truong L, Mandayam S, Chavarria D, Granera Llanes OM, Fonseca Laguna MU, Guerra Baez A, Garcia F, García-Trabanino R, Murray KO. Early detection of acute tubulointerstitial nephritis in the genesis of Mesoamerican nephropathy. *Kidney Int.* 2018;93(3):681-690.

4) Vallejos C. Comparative studies for determination of ochratoxin A in green coffee beans. *Encuentro.*2006; 36(73): 60-76

5)Schulz MC, Schumann L, Rottkord U, Humpf HU, Gekle M, Schwerdt G. Synergistic action of the nephrotoxic mycotoxins ochratoxin A and citrinin at nanomolar concentrations in human proximal tubule-derived cells. *Toxicol Lett.* 2018;291:149-157.

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