Rev. Fac. Med. Hum. 2024; 24(3):189-191.
DOI: 10.25176/RFMH.v24i3.6639
LETTERS TO THE EDITOR

ISSN Versión Online: 2308-0531
Facultad de Medicina Humana URP
RFMH

URIC ACID AND NEURODEGENERATIVE DISEASES: FINDING A PREDICTOR OF COGNITIVE DECLINE

ÁCIDO ÚRICO Y ENFERMEDADES NEURODEGENERATIVAS: ENCONTRANDO UN PREDICTOR DEL DETERIORO COGNITIVO

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LETTERS TO THE EDITOR

Mr. Editor:

I am writing to highlight the growing concern about the prevalence of neurodegenerative diseases globally and the urgent need to find predictors of early cognitive development.

Neurodegenerative diseases represent a significant burden for affected individuals, their families, and society at large[1-3]. Alzheimer's disease (AD) and Parkinson's disease (PD) are estimated to affect around 50 and 6.1 million people worldwide, respectively[1,2]. Meanwhile, amyotrophic lateral sclerosis (ALS), although less common than AD or PD, remains a devastating disease, affecting 2 per 100,000 people each year and the average life expectancy after diagnosis is around 2 to 5 years[3]. Finding early predictors of cognitive development could have a substantial impact on the management and treatment of these diseases[4,5]. Uric acid (UA) has emerged among the factors that can modify cognitive function both in the general population and in people with neurodegenerative diseases[4].

The role of UA as a predictor of cognitive function has been little studied. However, in the last four years, various investigations have left a promising panorama, with Europe and Asia being the continents that have done the most research in this regard[5-9]. In 2020, a cohort study conducted in Italy whose objective was to evaluate whether serum UA levels differ between older people with AD compared to those with mild cognitive impairment and healthy controls, found that people with late AD presented significantly lower serum UA levels compared to controls[5]. In 2021, in China, a longitudinal study aimed to evaluate the progression of mild cognitive impairment and AD in early stages by combining blood biomarkers, clinical and neuropsychological assessments; showing that higher levels of serum UA have a detrimental effect on normal cognition but a protective tendency in individuals with cognitive impairment[6].

In 2022, in the same country, 2 cohort studies were carried out that sought to find a relationship between the level of UA and cognitive impairment in patients with neurodegenerative diseases, in the first it was shown that serum UA levels were inversely proportional to cognitive dysfunction in patients with PD[7] and in the other study it was found that serum UA was significantly lower in AD and PD compared to controls[8].

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Cite as: Pernia-Gavedia P. Uric acid and neurodegenerative diseases: finding a predictor of cognitive decline. Rev Fac Med Hum. 2024;24(3):189-191. doi 10.25176/RFMH.v24i3.6639

Journal home page: http://revistas.urp.edu.pe/index.php/RFMH

And the present year, 2024, a cohort study carried out in Italy, whose objective was to explore the correlation between UA levels and cognitive impairment, concluded that patients suffering from ALS with frontotemporal dementia presented lower levels of uric acid compared to patients who had ALS with intermediate cognition or normal cognition [9]. Therefore, these studies may lead us to think that UA could prevent or delay the deterioration of cognitive function in patients with AD, PD and ALS.

Nevertheless, according to the author, research on neurodegenerative diseases has not yet been carried out in Latin America, including Peru. This lack of research can be attributed to limited resources, poor access to specialized medical care, research priorities in other areas of public health, lack of international collaboration, and need for government support. In Peru, there may also be limitations in research infrastructure, training of specialized personnel, and public awareness of the importance of these diseases.

In summary, the findings support the likely potential utility of serum UA as an early predictor of cognitive decline in patients with neurodegenerative diseases. The inverse correlation between UA levels and the degree of cognitive impairment suggests that monitoring UA levels could be a valuable tool in the early identification and monitoring of the progression of these diseases. These results open the door to future research that further explores the role of UA in the pathogenesis and progression of neurodegenerative diseases, as well as the development of potential therapeutic strategies based on the modulation of UA levels. It is recommended that more resources be allocated to research in this field, both nationally and internationally, to advance the identification of UA as a predictor of cognitive impairment in neurodegenerative diseases and improve our understanding of these pathologies. Furthermore, it is crucial to foster collaboration between researchers, institutions and governments to address this challenge comprehensively.

Author contributions: The author participated in the generation, collection of information, writing and final version of the original article.

Financing: Self-financed.

Conflict of interest: The author declare no conflict of interest.

Received: May 28, 2024.
Approved: July 03, 2024.

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REFERENCES

1.Alzheimer's Disease International. World Alzheimer Report 2019: Attitudes to Dementia. A global Survey. https://doi.org/10.1002/alz.038255

2.Dorsey ER, Constantinescu R, Thompson JP, Biglan KM, Holloway RG, Kieburtz K, et al. Projected number of people with Parkinson disease in the most populous nations, 2005 through 2030. Neurology. 2007;68(5):384-6. https://doi.org/10.1212/01.wnl.0000247740.47667.03

3.Kiernan MC, Vucic S, Cheah BC, Turner MR, Eisen A, Hardiman O, Burrell JR, Zoing MC. Amyotrophic lateral sclerosis. Lancet. 2011 Mar 12;377(9769):942-55. doi: 10.1016/S0140-6736(10)61156-7. Epub 2011 Feb 4. PMID: 21296405.

4.Bowman GL, Shannon J, Frei B, Kaye JA, Quinn JF. El ácido úrico como antioxidante del SNC. J Alzheimers Dis. 2010; 19(4):1331-6. doi: 10.3233/JAD-2010-1330. PMID: 20061611; PMCID: PMC2859185.

5.Boccardi V, ReGAI 2.0 Study Group:, Carino S, Marinelli E, Lapenna M, Caironi G, et al. Uric acid and late-onset Alzheimer's disease: results from the ReGAI 2.0 project. Aging Clin Exp Res [Internet]. 2021;33(2):361–6. Disponible en: http://dx.doi.org/10.1007/s40520-020-01541-z

6.Lee Y-G, Park M, Jeong SH, Kang SW, Baik K, Jung JH, et al. Effects of baseline serum uric acid and apolipoprotein E4 on longitudinal cognition and cerebral metabolism. Neurobiol Aging [Internet]. 2021 [citado el 15 de abril de 2024];106:223–31. Disponible en: https://pubmed.ncbi.nlm.nih.gov/34311431/

7.Shi X, Zheng J, Ma J, Wang Z, Sun W, Li M, et al. Low serum uric acid levels are associated with the nonmotor symptoms and brain gray matter volume in Parkinson's disease. Neurol Sci [Internet]. 2022 [citado el 8 de abril de 2024];43(3):1747–54. Disponible en: https://pubmed.ncbi.nlm.nih.gov/34405296/

8.Aerqin Q, Jia S-S, Shen X-N, Li Q, Chen K-L, Ou Y-N, et al. Serum uric acid levels in neurodegenerative disorders: A cross-sectional study. J Alzheimers Dis [Internet]. 2022 [citado el 8 de abril de 2024];90(2):761–73. Disponible en: https://pubmed.ncbi.nlm.nih.gov/36189590/

9.Iazzolino B, Grassano M, Moglia C, Canosa A, Manera U, Vasta R, et al. High serum uric acid levels are protective against cognitive impairment in amyotrophic lateral sclerosis. J Neurol [Internet]. 2024 [citado el 8 de abril de 2024];271(2):955–61. Disponible en: https://pubmed.ncbi.nlm.nih.gov/37880536/