Letter to Editor

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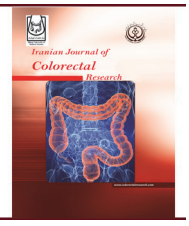

Colonic Alpha-Synuclein as Potential Early Biomarker for Parkinson's Disease Dementia

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Dear Editor

Parkinson's Disease Dementia (PDD) is a cognitive and reasoning decline that occurs in many patients living with Parkinson's disease (PD) at least a year following diagnosis. PDD must be detected and treated promptly, as its advancement might impair the patient's quality of life. This is particularly true given that patients with PD have a threefold increased risk of developing dementia (1).

Neurodegenerative disease detection technologies are rapidly evolving, with colonic alpha-synuclein being notable as an early biomarker of PD. Although it appears unconnected at first glimpse, colonic alpha-synuclein connects the gut-brain axis in PD via structural identification or purification of cell type-specific exosomes (2). However, despite enormous development potential, colonic alpha-synuclein research in PDD is quite limited compared to PD.

Alpha-synuclein deteriorates and extends to the limbic and neocortical regions in PDD, resulting in cognitive deficits. This development from PD to PDD may be associated with the quantity of aggregated alpha-synuclein in the colon. This also suggests employing the colonic alpha-synuclein cut-off concentration to detect the early progression of PD to PDD. Apart from concentration, the conformation of colonic alpha-synuclein can serve as a pathological hallmark. Van der Perren et al. (3) described differences in alpha-synuclein strains between patients with PD and PDD. While additional research is necessary, these findings highlight the significant potential of colonic alpha-synuclein in the early detection of PDD. This potential may even be extended to other synucleopathies, such as multiple system atrophy or dementia with Lewy bodies.

Despite the theoretical promise of colonic alpha-synuclein as an early diagnostic of PDD, the tissue sampling process may be a constraint. These restrictions, however, may be overcome with recent advancements in colonic mucosal biopsy. The use of alpha-synuclein levels in cerebrospinal fluid (sensitivity 89%, specificity 96%) as the gold standard for reviewing this method could be considered (4). Thus, additional studies are needed to close the information gap regarding using colonic alpha-synuclein as an early biomarker.

Conflicts of interest: None declared.

References

1. Aarsland D, Andersen K, Larsen JP, Lolk A. Prevalence and Characteristics of Dementia in Parkinson Disease: An 8-Year Prospective Study. Archives of Neurology. 2003;60(3):387-92.
2. Schaeffer E, Kluge A, Böttner M, Zunke F, Cossais F, Berg D, et al. Alpha Synuclein Connects the Gut-Brain Axis in Parkinson's Disease Patients - A View on Clinical Aspects, Cellular Pathology and Analytical Methodology. Front Cell Dev Biol. 2020;8:573696.
3. Van der Perren A, Gelders G, Fenyi A, Bousset L, Brito F, Peelaerts W, et al. The structural differences between patient-derived α-synuclein strains dictate characteristics of Parkinson's disease, multiple system atrophy and dementia with Lewy bodies. Acta Neuropathologica. 2020;139(6):977-1000.
4. Poggiolini I, Gupta V, Lawton M, Lee S, El-Turabi A, Querejeta-Coma A, et al. Diagnostic value of cerebrospinal fluid alpha-synuclein seed quantification in synucleinopathies. Brain. 2022;145(2):584-95.