LETTER TO THE EDITOR

GUT-BRAIN AXIS HYPOTHESIS-AN INNOVATIVE WAY TO CURE PARKINSON IN PAKISTAN?

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Dear Editor;

According to Parkinson's Disease Foundation (PDF), more than 10 million people worldwide are suffering from Parkinson's disease.[1] Parkinson's disease (PD) is a chronic and progressive movement disorder. It involves the malfunctioning and death of the neurons in substantia nigra of brain that is responsible for producing dopamine, an inhibitory neurotransmitter. Symptoms of this disease include tremors, bradykinesia, rigidity, postural instability etc. Communication between the gut and the brain is not one way. It's a bidirectional communication system in which reciprocal signals can be transferred. An important direct pathway is the vagus nerve. Therefore, any pathology in the gut can lead to brain pathology and vice versa. For example, enteric inflammation can induce a number of affects that ultimately alter CNS function.[2] This gateway can provide wide therapeutic opportunities for various incurable brain pathologies such as Parkinson disease.

In 2012, a study was conducted in which colonic biopsy samples available of Parkinson patients were immunochemically analysed for the presence of α-synuclein. The results showed that all the Parkinson patients were positive for α-synuclein.[3] In another study, the gastric, duodenal and colonic biopsies were taken up to 8 years prior to the onset of motor symptoms. All patients with positive biopsies had early autonomic symptoms and all controls were negative.[4] The presence of α-synuclein in the gut biopsy of disease positive patients in the pre-clinical phase suggest a gut origin of the disease. In 2016, another study was conducted in which researchers used genetically programmed mice to develop Parkinson's as they produced very high levels of the protein alpha-synuclein, which is associated with damage in the brains of Parkinson's patients. But only those animals with bacteria in their stomachs developed symptoms. Sterile mice remained healthy.[5] It is thought that α-synuclein aggregates due to oxidative stress produced by certain bacteria in gut.[6]

Pakistan is a third world country where most of the families have only one earning person and If he is suffering from Parkinson, his quality of life is so affected that his family is devoid of any income resulting in lack of medicines that are required in the long run. The medicines are very expensive and the more severe the disease is, the more it costs. Current medications such as carbi-levodopa, dopamine agonists, anti-cholinergics have serious side effects such as severe hallucinations, sleeplessness, dry mouth or impaired urination. Moreover, they do not 'TREAT' the disease and the patients can never turn back to their normal health. Another disadvantage is non-compliance which is very common in our country. Taking several doses, a day makes life difficult.

As there is a strong clue to the origin of disease in the gut, identifying and treating the responsible pathogens with antibiotics before the death of neurons could prevent the development of incurable Parkinson disease. Another option is treating the patient with alpha-synuclein antagonists. These options will cure the disease with less cost rather than affording medicines for lifetime and would decrease the disease burden worldwide.

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