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EFFECT OF PARKINSON'S DISEASE ON THE SEROLOGICAL LEVELS OF SOME NEUROTRANSMITTERS AND INTERLEUKIN-5

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ABSTRACT : Parkinson's disease is a chronic neurodegenerative disease that affects the central nervous system and is thought to be a multidisciplinary disease. Eighty samples were collected, 35 of which were suffered from Parkinson's disease (19 males and 16 females) and 45 samples of healthy people (33 males and 12 females) during the period from November 2017 to March 2018. The collection site of the control group included donors from Najaf province. The samples of persons with Parkinson's disease were collected from several governorates (Najaf, Babylon and Baghdad). The levels of some neurotransmitters, dopamine, epinephrine and norepinephrine and one of the immunological parameters, interleukin-5, were measured using ELISA method and the results were analyzed using student t-test at level 0.05. The results showed significantly different (decrease) (P <0.05) in both norepinephrine and interleukin-5 levels in Parkinson's patients than in the healthy group, While dopamine and epinephrine did not show significant differences (P> 0.05). The rate of dopamine concentration was significantly different between males and females with Parkinson's disease. The concentration of dopamine was lower in males than females. The epinephrine, norepinephrine and interleukin 5 levels showed no significant differences (P> 0.05) in Parkinson's disease between males and females. The study didn't recorded any significant differences in neurotransmitters levels and interleukin 5 between healthy males and females.

The results of the current study showed no effect of Parkinson's disease stages or severity on the concentrations of neurotransmitters and interleukin-5. There were no significant differences between individuals with primary infection and those with secondary infection. The effect of the use of Sinemet CR (Carbidopa-Levodopa) drug on neurotransmitters levels and interleukin-5 was studied in people with Parkinson's disease. The statistical analysis showed a significant difference in the concentration of dopamine only, as its concentration in patients using the treatment showed a significant decrease compared with the group of people who did not take treatment. In conclusion, some blood clues can be considered as indicators of the occurrence of the Parkinson disease and the possibility of using some neurotransmitters and immunological parameters in the blood as indirect biomarkers of PD.

Key words : Parkinson's disease, dopamine, epinephrine, norepinephrine, interleukin- 5

INTRODUCTION

Parkinson's disease (PD) was first recorded as a medical condition several years after the British surgeon James Parkinson described similar cases among older patients in his publication "An Essay on the Shaking Palsy" in 1817 (Shulman *et al*, 2011), named after him. It is the second most common neurodegenerative disease after Alzheimer's disease (Nagatsu and Sawada, 2005). The disease is compose 1% in people over the age of 60 (Dézsi and Vécsei, 2011). The disease results from cell decomposition Dopaminergic neurons in the brain. Clinical signs of PD are involve non-motor symptoms as mental retardation, cognitive decline and motor symptoms (external abnormal movements that appear on the body) (Trempler *et al*, 2017). The most common of latter which are bradykinesia, rigidity and tremor (Less *et al*, 2009). The cause of this disease is still unknown, although there are some indications of genetics, environmental factor or a combination of the two. It is also possible to have more than one cause of the disease. Scientists believe that both genes and the environment interact to cause PD (Lang and Obeso, 2004). Other studies have identified the incidence of Parkinson's disease to exposure to bacterial and viral infections and other parasitic pathogens (Chao *et al*, 2014). Some of studies suggest that certain parasites may influence in some way on neurotransmitters levels in the host's body, which may be the cause of PD (AL-Hadad *et al*, 2019). Although, there is no cure for the disease, taking the drug improves symptoms of the disease, in some cases the doctors may suggest brain surgery to improve symptoms (Fahn, 2006). The therapeutic drugs of PD, such as levodopa cause side