

LITERATURE

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**UDC 616.855-02-036.2(548.7)**

**EVALUATING THE PREVALENCE  
OF PARKINSON'S DISEASE AND ITS CAUSES, IN SRI LANKA**

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***Introduction***

Parkinson's disease (PD) is a progressive neurological disorder that results from loss of dopaminergic neurons in the substantia nigra. The cause of neuronal damage remains largely unknown, but believed to be associated with both genetic and environmental factors. PD is characterized by motor and non-motor symptoms. Quality of life of the patients with PD is severely affected by both motor and non-motor symptoms.

***Goal***

To evaluate about the prevalence and causes of Parkinson's disease in Sri Lanka.

***Material and Methods of research***

We searched for the articles published in Mayoclinic, NIA.NIH, Thelancet and worldlifeexpectancy.com about PD using the keywords «Parkinson's disease» and «Causes of Parkinson's disease» to review the epidemiological causes and PD statistics in Sri Lanka. And referred other researches and publications done about PD, such as «the association of lifestyle factors and PD» and «prevalence of PD in patients visiting the clinic for movement disorders» to understand the demographics and statistics in Sri Lanka.

The patients used in the researches which were referred while analyzing the data for this study are random set of local patients in Sri Lanka.

***The results of the research and their discussion***

About 5.2 million people suffer from PD worldwide. It is commoner in Europe and North America than in Africa; this could reflect a difference in life expectancy since PD is mainly, a disease of elderly. Parkinsonism is an umbrella term for several neurodegenerative diseases. A person has a 2.5-3 times higher risk of developing PD if a first-degree relative has the disease. However, familial PD is rare (<5 %). onset after the age of 50 years is less likely to be genetically influenced. The average age of onset is 65 years. Young-onset PD, onset under the age of 40 years, accounts for about 5-10 % of all cases. The incidence of Parkinson disease has been estimated to be 4.5-21 cases per 100,000 population per year, and estimates of prevalence range from 18 to 328 cases per 100,000 population, with most studies yielding a prevalence of approximately 120 cases per 100,000 population. The wide variation in reported global incidence and prevalence estimates may be the result of a number of factors, including the way data are collected, differences in population structures and patient survival, case ascertainment, and the methodology used to define cases.

The cause of loss/damage/death of dopaminergic neurons in the substantia nigra is largely unknown. People with Parkinson's also lose the nerve endings that produce norepinephrine, the main chemical messenger of the sympathetic nervous system, which controls many automatic functions of the body, such as heart rate and blood pressure. The loss of norepinephrine might help explain some of the non-movement features of Parkinson's, such as fatigue, irregular blood pressure, decreased movement of food through the digestive tract, and sudden drop in blood pressure when a person stands up from a sitting or lying-down position. Age is not the only factor contributing to development of PD. A combination of an inherited susceptibility and exposure to environmental risk factors could cause PD and this warrant further research. But many researchers now believe that Parkinson's disease results from a combination of genetic factors and environmental factors.

There is little doubt that genetic factors contribute to development of PD, but their significance is yet to be established. Advances in genetic research have enabled identification of 12 genes associated with PD (PARK1 to PARK11, and NR4A2). Each gene mutation expresses different clinical features, with some overlap.

The evidence of an association between environmental risk factors and development of PD is weak and the literature should be interpreted with caution. Suggested environmental factors include exposure to pesticides, herbicides or heavy metals (manganese, copper). Conversely, cigarette smoking is negatively associated with development of PD. Other such proposed protective factors are coffee consumption, drinking alcohol and physical activity

Prevalence of PD in Sri Lanka (2016 counts) is 17 814 (14 263 to 21 949) and the deaths (2016 counts) is 558 (402 to 758) The global prevalence is 6 062 893 (4 971 461 to 7 324 997) with 211 296 (167 771 to 265 160) deaths. The number of patients is considerable in Sri Lanka with respect to global numbers. When comparing the mortality rates, it has been increased (from 2016-2018). According to studies, male population is greatly affected than females. This may be due to less exposure of females to certain chemical factors. Chemical factors which may cause PD include exposure to pesticides, herbicides or heavy metals, but Nicotine is negatively associated with development of PD. But we cannot compare the connection between smoking and PD because of smoking is females is very less compared to males. As Sri Lanka is an agricultural country the use of chemicals like insecticides, pesticides and herbicides in agriculture may affect the incidence of PD in men.

Other such negatively affecting factors are coffee consumption, drinking alcohol and physical activities like exercise. But in Sri Lanka the consumption of coffee is very less when compared to the western countries. And the tea consumption is high. But there's only a handful of studies done about the connections of tea and PD in South Asian countries. So, the data is very less to come to a conclusion. Consuming alcohol and smoking are mostly done by male population which is a cultural aspect seen in almost all South Asian countries. According to the research articles we referred, the factors negatively affecting PD stands out to be legit. And according to some recent foreign studies, addiction to nerve stimulants like nicotine and caffeine acts negatively against incidence of PD. But with the very limited information and studies about this matter in Sri Lanka, we must state that it must be researched furthermore. And among the patients with movement disorders, Parkinsonism was the commonest movement disorder according to a study done in National Hospital, Colombo. PD is a serious condition as it affects the movement actions of the patient. It affects the whole family, for an example if the breadwinner of the family has PD, it puts the whole family to a difficult position. Disability-adjusted life-years in Sri Lanka is 9475 (6993 to 12 384) and Percentage change in age-standardized rates (1990–2016) is 11.9% (-5.4 to 31.9) DALYs for a disease or health condition are the sum of the years of life lost to due to premature mortality

(YLLs) and the years lived with a disability (YLDs) due to prevalent cases of the disease or health condition in a population.

### **Conclusions**

Deaths due to PD is about 0.50 % of total deaths in Sri Lanka. But the attention should be given to researching about PD as it has no tests (blood or laboratory) to diagnose it rather than considering the patient's medical history and neurological examination. People may not consult a doctor in idiopathic PD if the symptoms are mild due to lack of knowledge. But if it's from an accident, it will be diagnosed in the hospital or even later because the patient's suspicions about the symptoms. The connection of Nicotine and caffeine which is said to act negatively to PD should be studied even more because it'll be a help when formulating precautions and preventive methods.

### **LITERATURE**

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