

ly associated with cervical and incomplete motor dysfunction injury. It shows that we should pay more attention to peasants, laborers and the elderly in the prevention, hospitalization and rehabilitation of SCI. Mortality is significantly related with increasing age. Mortality of SCI patients over 60 years is much higher than that of SCI patients under 60 years of age. As for those who reach older age will typically have incomplete or lower-level SCI, and will have relatively high degrees of independence and good health. As reported, the mortality rate was highest within 1 year after SCI. Risk factors for death comprised heart disease, diabetes, lower levels of pulmonary function and cigarette smoking. The most common causes of death were circulatory system diseases (40 %) and respiratory diseases (24%). Death in SCI patients is a result of the interaction of many factors, we should aim at high-risk groups, especially older and heavier patients to strengthen nurse and treatment, and actively improve the general condition of patients; at the same time, actively manage various complications, such as prevention of respiratory infection and correcting electrolyte disturbances, and so that reduce the mortality of SCI patients. Despite these comprehensive bioinformatics analyses, the current study presents several limitations. Understanding and recognizing the epidemiological characteristics of SCI is indispensable for the optimal allocation of therapeutic resources and to provide more effective medical services to SCI patients. We expected, through our research, to understand the epidemiological characteristics of SCI much better in order to guide clinical practice and reduce social economic burden.

Conclusions

There have been a lot of changes in the trends of epidemiology of SCI. MVAs and falls are the most common causes of injury. SCI incidence varies by regions or countries. With the expansion of human activities, the incidence of SCI has gradually increased. The prevalence did not change much over time. The number of male patients was significantly more than the number of female patients. The average age of patients with SCI has a tendency to increase gradually. Cervical level of spine was the most common site of injury; patients with tetraplegia were more than those with paraplegia. Moreover, mortality has been stabilized, although still persists at a high level. Therefore, how to further reduce the incidence of SCI and improve prevention and treatment measures to promote the prognosis of SCI patients are the problems that we should study in the future.

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PARKINSON'S DISEASE AS A POST COMPLICATION OF COVID-19

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Introduction

Parkinson's disease is a condition in which parts of the brain become progressively damaged over many years and lead to have shaking, stiffness and difficulty with walking, balance and coordination [2].

Both men and women can have Parkinson's disease. However, the disease affects about 50 % more men than women. One clear risk factor for Parkinson's is age. Although most people with Parkinson's first develop the disease at about age 60, about 5 to 10 % of people with Parkinson's have «early-onset» disease, which begins before the age of 50. Early-onset forms of Parkinson's are often, but not always, inherited, and some forms have been linked to specific gene mutations.

Until now there's no cure for Parkinson's disease [3, 5]. Treatments only improve the symptoms. Initial treatment with the medications Levodopa, MAO-B inhibitors or Dopamine antagonists. At the same time with the progression of the disease, effectiveness of the drugs decreases and develop side effects such as involuntary muscle movement [4]. Surgery to place microelectrodes for deep brain stimulation has been used to reduce motor symptoms in severe cases where drugs are ineffective [1].

The disease is named after English doctor James Parkinson. Public awareness campaigns include World Parkinson's day which is on 11th April and the use of a red tulip as the symbol of the disease [3].

Goal

The purpose of this article was to describe that there's a possibility that a COVID-19 infected patient could later develop neurological problems which are similar to the early symptoms of Parkinson's disease and about the mechanism of development of those symptoms and what are the risk factors of developing PD (Parkinson's disease).

Material and Methods of research

We searched the articles about the recent studies which demonstrate the link between the Parkinson's disease and COVID-19 in NSCID, WEBMD, PubMed, Medline, EMBASE and the Web of Science. And also referred a case history of a COVID-19 infected patient who has later developed Parkinson's disease and a journal of neurological science which has information about COVID-19 related cases of Parkinsonism. Furthermore, we searched about the articles which has information about viral parkinsonism that occurred during various pandemics in the past and the their connection with other viruses and the postencephalitic parkinsonism from a journal of Mayo Clinic.

The results of the research and their discussion

Parkinson's disease is a brain disorder where lesion occurs in substantia nigra and is connected with insufficient synthesis and receiving Dopamine by the corpus striatum. It manifest 5 groups of symptoms. They are Hypokinesia, the muscular hypertonia, the tremor of rest, the vegetative disturbances, the mental disturbances [2]. Hypokinesia is the weakness and retardation of movements. The face is hypomimia, speech is slow & fading writing, postural instability, starting a movement & change of posture is retarded. The muscular hypertonia is the increase of muscle tone in the start of movement and remain during the whole movement; it's defined in the flexors and extensor at the same time [4]. The tremor of rest / parkinsonism tremor is the finely-sweeping rhythmical tremor of the fingers like rolling pills which increase during excitement and disappears with movement and during sleep. Tremors are present in lower extremities and chin too. The symptoms of vegetative disturbances are orthostatic hypotension, tachycardia in rest, arterial hypertension in horizontal position, hypo hidrosis & anhidrosis, impotency, constipation, diarrhea, urine incontinence, the sebaceous face hyperkeratosis, hypersalivation and etc. The mental disturbance develops in later stages such as depression of the rate of thinking, viscosity of thinking and obsession [1, 5].

The 1st suggestion of a relationship between viral infection and Parkinson's disease was in 1920–1930s influenza epidemic, which was associated with an atypical encephalitis, encephalitis lethargica. Although encephalitis lethargica patients exhibited drastic irregularities in disease progression and displayed 'symptomologic

polymorphism', Encephalitis lethargica described as a type of 'sleeping sickness', which can include headache, nausea, fever, uncontrollable sleepiness, catatonia and sometime coma [3]. There have been numerous cases of post — encephalitic Parkinsonism after certain viral infections (H5N1, coxsackie virus, Japanese encephalitis Band HIV), but these cases often do not exhibit the same cellular or molecular pathologies as seen in Parkinson's disease and are suggested to be 'phenocopies' of Parkinson's disease [5].

And also viral infections may play a role in triggering earliest stages of Parkinson's by setting off a cascade that results in the death of brain cells that produce dopamine, a vital chemical messenger whose absence leads to movement issues such as freeze and tremor.

Recently several cases have been reported from European countries such as UK [4]. Most of them are without a family history of Parkinson's and without any known early Parkinson's symptoms such as noticeable change in handwriting and become smaller than previously, difficulties in speech, handling some objects such as mobile phone, hypomimia, moderate cogwheel rigidity in neck, right & left legs and slow gait. There are no significant changes in blood test, CSF test, CT scan of the brain, MRI and EEG. Some have showed an improvement in their Parkinson's like symptoms following treatment with traditional Parkinson's medications that replenish dopamine, some covered without spontaneously (without any medications).

These symptoms occurred in relatively young people who are much younger than the average age of developing Parkinson's disease and also Parkinson's is normally a very slowly developing disease, but in these cases, something happened quickly [3]. It may be that younger people has more recovery ability from the infection but be left with neurological symptoms, such as brain fog and depression. Studies have proven that COVID-19 has direct damage on brain (encephalitis), strokes or lack of Oxygen. This may be a leading factor to develop Parkinson's disease later. Or else patients were destined to develop Parkinson's disease and the viral infection only accelerated an ongoing neurodegenerative process at the same time.

Although COVID-19 is considered as a respiratory virus, it's higher virulence and potential pathogenic has the ability to cause severe neurological manifestations despite mild respiratory symptoms [2].

Conclusions

Based on the evidences from the cases that has reported and the mechanism of the development of the Parkinson's disease, 4 ways that COVID-19 infection could contribute to onset of the Parkinson's.

COVID-19 is linked to blood clots and other problems with the vascular system, including the brain. These vascular insults could cause damage to the area of the brain that produces dopamine, which subsequently could result in a loss of dopamine that mirror's Parkinson's.

There is a demonstrated link between chronic inflammation and Parkinson's. It's possible that severe inflammation of the brain that occurs due to COVID-19 could cause cell death and brain damage.

This may be neurotropic virus, that attacks the nervous system. Because in the early symptoms of COVID-19 infection shows loss of smell and issues with the gut. Additionally, COVID-19 infection could lead to an increase in alpha-synuclein, a protein associated with Parkinson's.

The person is destined to have the Parkinson's disease and after having the COVID-19 infection, Neurodegenerative process got accelerated and worsened.

Although we cannot clearly demonstrate a link between Parkinson's and COVID-19 infection, we cannot exclude that fact. This situation is difficult to diagnose since it shows only clinical evidences and there's no any remarkable changes in other tests (blood test, CSF, CT, MRI, EEG). Recent studies says that there's a 90 % of chance of getting end up with early symptoms of Parkinson's after having COVID-19 infection.

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**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.