Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

ELSEVIER

Parkinsonism and Related Disorders 4 (1998) 207–209

Parkinsonism & Related Disorders

Rare tendency of catching cold in Parkinson's disease

N. Kawaguchi[a,*], T. Yamada[a, b], T. Hattori[a]

[a]*Department of Neurology, School of Medicine, Chiba University, 1-8-1 Inohana, Chuo-ku, Chiba 260-8670, Japan*
[b]*Department of Internal Medicine and Health Care, School of Medicine, Fukuoka University, Fukuoka, Japan*

Received 8 October 1998; received in revised form and accepted 8 October 1998

Abstract

We carried out a study, using a questionnaire, that indicated that persons with Parkinson's disease (PD) catch relatively fewer colds that are unusually mild. This tendency seems to have no clear relationship to the severity of the PD, the time after the onset of PD, or whether or not the patient is taking antiparkinsonian drugs either as mono therapy or in combination. The study found no similar phenomena among spouses of the PD patients or among patients with cerebrovascular disease. These results suggest that a low frequency of colds is a unique feature in persons with PD.

Keywords: Parkinson's disease; Catching cold; Influenza virus infection

1. Introduction

Parkinson's disease (PD) is a degenerative disease of the central nervous system clinically characterized by bradykinesia, muscular rigidity, tremor, and postural instability. The peak age of onset of PD is from 40 to 70 years of age. It has been reported that PD patients have a decreased tendency to catch colds [1]. On the contrary, Christopher et al. speculated that there might be an increased risk of developing PD among individuals born following an influenza epidemic [2]. A case-control study evaluating risk factors for PD suggested that the frequency of severe flu-like illness was higher in the PD group than in the controls during the pre-parkinsonian period [3]. Summing up these reports, one may speculate that the PD patients who suffered from a flu-like illness in utero or in childhood may have a reduced tendency to catch cold after the onset of PD. In the present study, we examined the frequency of colds in patients with PD, their spouses and patients with cerebrovascular disease (CVD). We found that the PD patients did have fewer colds than the persons in the other groups.

2. Subjects

One hundred and thirty-nine patients clinically diagnosed with PD according to the UK Parkinson's Disease Society Brain Bank clinical diagnostic criteria [4] were randomly selected at the Neurology Department of Chiba University Hospital and affiliated institutions. Sixty-seven spouses of the PD patients, living in the same environment, were used as normal controls. Thirty seven CVD patients were also examined as diseased controls. The age of the 55 male and 84 female patients with PD ranged from 28 to 87 (mean age 63.5), that of the 35 male and 32 female normal controls from 40 to 86 (mean age 64.3), and that of the 28 male and 9 female patients with CVD from 51 to 87 (mean age 66.6) (Table 1). Statistical analysis using a one-way ANOVA showed no significant difference in age between the groups.

3. Methods

A survey (Table 2) was carried out, using a questionnaire, among the PD patients and control groups regarding the frequency of colds or fever requiring bed rest, in the pre- and post-onset period of PD or CVD. The results were analyzed statistically using unpaired *t*-tests. The normal control group was asked about the conditions during the pre- and post-onset period of PD in their spouses.

4. Results

The number of PD patients who had a cold with high fever requiring bed rest prior to the onset of PD was slightly less than that in the other groups, but the differences were not statistically significant (Table 3). After the onset of PD, significant differences in the frequency of such flu-like

* Corresponding author.

1353-8020/99/$ - see front matter
PII: S1353-8020(98)00035-2

Table 1
Profiles of PD patients

Duration (years) ± S.D.	7 ± 5
Antiparkinsonian drugs	
Taking	135
Not taking	4
Severity (Hohen & Yahr stage)	
I	20
II	44
III	57
IV	16
V	2

illness appeared between the PD and the normal control groups ($p < 0.001$), and between the PD and CVD groups ($p < 0.005$), but no significant difference was found between the two control groups (Table 4). Many of the PD patients never caught cold and only 4 PD patients (2.9%) suffered cold with a high fever requiring bed rest; this was markedly different from the controls. No subject reported that they caught cold more frequently or with more severe symptoms after the onset of PD.

The results of more detailed statistical analysis regarding pre- and post-onset changes using χ^2 test are shown in Table 5. Forty-three of the 139 PD patients (30.9%) showed a decreased frequency of colds or flu-like illnesses post-onset as compared with pre-onset (responses 4,5,6). This compared with 3 of 67 of their spouses (4.5%) and one of 37 CVD patients (2.7%) reporting a similar change in susceptibility ($p < 0.001$). Only 1.4% of the PD patients reported flu-like episodes (response 3), a significantly lower percentage than in the controls.

The PD group was further analyzed to determine whether taking amantadine hydrochloride or levodopa affected the frequency of colds. No differences were found in the frequency of colds in PD patients taking different antiparkinsonian medication (detailed data not shown). Nor did the severity or duration of PD have any apparent effect on the susceptibility to colds.

Table 2
Content of survey

Regarding catching cold

A. Prior to onset of PD or CVD (or their spouse's onset of PD).
a-1. Never caught cold.
a-2. Sometimes caught cold but never had high fever or required bed rest.
a-3. Sometimes had high fever and required bed rest.
Change in catching cold after onset
(1) No change; (2) Changed
B. If there was a change, please indicate in the following.
b-1. Stopped catching colds.
b-2. Sometimes caught cold but never had high fever or required bed rest.
b-3. Sometimes had high fever and required bed rest.
b-4. Caught cold more frequently and with higher fever and required more bed rest.

Table 3
Pre-onset status of catching cold. (Survey response: a-1; Never caught cold. a-2; Sometimes caught cold but never had high fever or required bed rest. a-3; Sometimes had high fever and required bed rest.)

Survey response	PD group	Normal controls	CVD control
a-1	21(15.1%)	11(16.4%)	8(21.6%)
a-2	95(68.3%)	35(52.2%)	20(54.1%)
a-3	23(16.6%)	21(31.4%)	9(24.3%)
Total No. of persons	139	67	37

5. Discussion

This study has revealed a tendency for patients with PD to have fewer or less severe colds following the onset of PD compared to pre-onset, while their spouses, presumably living in a similar environment, do not show a similar change over the same period. A survey of patients with CVD did not show similar changes to the PD cases regarding the frequency of colds. Thus, it is unlikely to be an environmental factor, but rather PD itself that causes the change in susceptibility.

A variety of viruses are known to cause cold. They include the rhinovirus, coronavirus, adenovirus, influenza, human parainfluenza virus, coxsackievirus, echovirus and poliovirus. Infection with influenza virus produces symptoms such as headache, muscle ache, and high fever more severely than the other viruses mentioned and often requires bed rest. The exhibition of cold symptoms following invasion of the body by a virus is a universal phenomenon, but we report that PD patients show a higher resistance to viral infection than do normal individuals.

Agents such as interferon and anti-viral acute phase proteins are produced after viral infection as an initial immunological response. If the reproduction of the virus cannot be adequately controlled at this stage, other secondary immunological reactions evolve, such as activation of lymphocytes and production of antibodies and other cytokines. One of the acute phase proteins, MxA, is known to have anti-viral properties against the influenza A virus [5,6,7]. We have reported possible links between influenza A virus and PD, namely that a neurovirulent strain of influenza A virus invades the substantia nigra and that MxA exists in the Lewy bodies of neurons in the brains of PD patients [8]. Further study is required on the mechanism of resistance to flu-like illness in PD.

Table 4
Post-onset status of catching cold. (Survey response: b-1; Stopped catching colds. b-2; Sometimes caught cold but never had high fever or required bed rest. b-3; Sometimes had high fever and required bed rest.)

Survey response	PD group	Normal controls	CVD control
b-1	53(38.1%)	14(20.9%)	8(21.6%)
b-2	82(59.0%)	34(50.7%)	19(51.4%)
b-3	4(2.9%)	19(28.4%)	10(27.0%)
Total No. of persons	139	67	37

Table 5
Change in catching cold after onset of PD. (Survey response: a-1; Never caught cold. a-2; Sometimes caught cold but never had high fever or required bed rest. a-3; Sometimes had high fever and required bed rest. b-1; Stopped catching colds. b-2; Sometimes caught cold but never had high fever or required bed rest. b-3; Sometimes had high fever and required bed rest.)

Survey response	PD group	Normal controls	CVD control
a-1 to b-1	21(15.1%)	11(16.4%)	8(21.6%)
a-2 to b-2	71(51.1%)	34(50.7%)	18(48.6%)
a-3 to b-3	2(1.4%)	18(26.9%)	8(21.6%)
a-2 to b-1	22(15.8%)	0	0
a-3 to b-1	10(7.2%)	3(4.5%)	0
a-3 to b-2	11(7.9%)	0	1(2.7%)
a-2 to b-3	2(3.6%)	1(1.5%)	2(5.4%)
Total No. of persons	139(100%)	67(100%)	37(100%)

References

[1] Nomoto M, Igata A. The Parkinson patients have a greater resistance to common cold. Neurol. Med. (Tokyo) 1982;16:274–276.

[2] Christopher M, Michael M, Gerald S. Could Parkinson's disease follow intra-uterine influenza? A speculative hypothesis. J. Neurol. Neurosurg. Psychiatry 1988;51:753–756.

[3] Treves TA, Wechsler M, Rabey JM, Korczyn AD. Risk factors for Parkinson's disease: case-control study with temporal approach. Neurology 1991;41(suppl. 1):371.

[4] Gibb WRG, Lees AJ. The relevance of the Lewy body to the pathogenesis of idiopathic Parkinson's disease. J. Neurol. Neurosurg. Psychiatry 1988;51:745–752.

[5] Ronni T, Sereneva T, Pirhonen J, Julkunen I. Activation of IFN-α, IFN-γ, MxA and IFN regulatory factor 1 genes in influenza A virus-infected human peripheral blood mononuclear cells. J. Immunology 1995;154:2764–2774.

[6] Pavlovic J, Zurcher T, Haller O, Staeheli P. Resistance to influenza virus and vesicular stomatitis virus conferred by expression of human MxA protein. J. Virology 1990;64:3370–3375.

[7] Pavlovic J, Haller O, Staeheli P. Human and mouse Mx proteins inhibit different steps of the influenza virus multiplication cycle. J. Virology 1992;66:2564–2569.

[8] Yamada T. Viral etiology of Parkinson's disease: Focus on influenza A virus. Parkinsonism & Related Disorders 1996;2:113–121.