

Clinical Study of the Impairment of the Activities of Daily Living in Parkinson's Disease

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Abstract: 293 patients suffering from Parkinson's disease, randomly picked, were studied. The patients' condition was assessed by the Unified Parkinson Disease Rating Scale–UPDRS. The modified Hoehn and Jahr scale and the Schwab and England Activities of Daily Life Scale were also used. Electromyography studies of tremor were conducted as well. The results obtained were processed with the help of statistical methods. Static tremor had the highest incidence – found in 274 patients (93,1%), followed by walking disorders – in 203 patients (69,29%) and difficulties in dressing – in 195 patients (66,5 %). The moderate, bothersome to the patient tremor prove to be the most frequently observed symptom – in 158 patients (53,9%), followed by severe tremor, which interferes with many of the patient's – in 82 patients (25,9%). Their incidence increased considerably as compared to the marked tremor – in 9 patients (3%). Mild difficulties in walking, when the patient may swing arms and slip and drag legs, found in 108 patients (36,8%), were considerably more frequent as compared to the inability to walk alone, even when assisted, observed in 4 patients (3%). Slowed dressing – in 109 patients (37,2 %) was more frequent as compared to cases when considerable help was required – in 6 patients (2%). The studied group of patients manifested other basic symptoms of the disease as well: rigidity and pains – in 193 patients (65,8%), difficulty in dressing – in 195 patients (66,5%) and handwriting disorders – in 192 patients (62,5%). Less frequent were fallings unrelated to “freezing” – in 95 patients (32,4%) and salivation disorders – in 77 patients (26,2 %), while the swallowing disorders were the least frequently observed – in 76 patients (25,9%).

Keywords: Parkinson's disease, activities of daily living

1. Introduction

Resting tremor is one of the most frequent and typical symptoms of Parkinson's disease. The tremor is unilateral, it ranges in the frequency of 4 and 6 Hz and is almost always observed in the distal part of the limbs. It may affect the lips, jaws and legs, but, in contrast to the essential tremor rarely affects the neck and head. In this respect head tremor is most frequently due to essential tremor; it can also be a sign of cervical dystonia, or is a combination of the two conditions, but is not a symptom of Parkinson's disease. A characteristic feature of tremor is that it disappears altogether during sleep. Some patients also report for “inner” tremor which is not visible.

“Freezing” is also a form of akinesia and is one of the most disabling symptoms of Parkinson's disease. /Giladi N, Mc Dermott, Fahn S et al, 2001/. Although “freezing” is a characteristic feature of Parkinson's disease it is not a universal symptom. Based on responses by 6620 patients to a special questionnaire, sent to 12000 members of the German Parkinson Association, 47% of them reported “freezing”. It occurred more frequently in men than in women and less frequently in patients whose main symptom is tremor /Macht M, Kaussner Y, Moller J et al, 2007/.

The fear of falling may additionally impair the balance in movement control in patients suffering from Parkinson's disease. A study found that 38% of the patients with Parkinson's disease have fallen, while 13% of them have fallen more than once a week. It has been found that the frequency of falling correlates to the severity of the disease. Treatment with dopaminergic antagonists, pallidotomy and

deep brain stimulation could relieve these symptoms. /Roberts-Warrior D, Overbw A, Jankovic J et al, 2000/. The frequency of fallings unrelated to “freezing” is different in different studies /Edwards M, Quinn N, Bhatia 2008/.

Aim

Study of the frequency of impairment of daily living activities in Parkinson's disease.

Material and Methods

293 patients with Parkinson's disease (129 men and 164 women) aged 58-79, randomly picked for an 8-year period (2005-2012) were studied. The study used the following assessment tools:

- 1) Unified Parkinson's disease rating scale – UPDRS
- 2) Modified Hoehn and Yahr scale for assessment of clinical symptoms
- 3) Schwab and England Activities of Daily Living Scale
- 4) Electromyographic studies of tremor (tremorograms) performed with EMG equipment
- 5) Statistical methods for processing the data received – SPSS statistics software was used

2. Results

Activities of Daily Living

Speech disorders were found in about one third of the patients - 91 /31%/. Mild forms of speech disorders prevailed – mildly and moderately affected speech, which increased insignificantly in both genders as compared to the frequency of occurrence of unintelligible speech in 5 patients / 1%/.

Different degrees of hypersalivation were observed in 77 patients /26,2% /.

Slight saliva excess was most frequent, followed by moderately excessive saliva, while marked salivation and drooling, which requires constant tissue use was not found in the patients of the study. No gender-related significant differences were found. Swallowing disorders were observed in 76 patients / 25,9 %/. Rare and occasional choking were the rarest, and they prevailed among two parts, include the labels “(a)” and “(b)”. Handwriting disorders were very frequent in our patients - 192 / 85,2 %.

Table 1: Frequency of handwriting disorders in Parkinson’s disease

Clinical symptom – stage of impairment	Gender men	Gender women	Total
Handwriting	n %	n %	n %
0= normal			
1= slightly slow or use of small letters	27 20,9	46 28	73 24,9
2= moderately slow or use of small letters, but all words are legible	27 22,4	61 37,1	88 53,6
3= severe affected, not all words are legible	15 11,6	13 7,9	28 9,5
4= the majority of words are not legible	2 1,5	2 1,2	3 1
Total	71 55	122 74,3	192 65,2

Moderately slowed writing with small letters was the most frequently observed symptom - in 88 patients / 53,6% /, followed by slightly slowed writing –in 73 patients / 24,9 /. The frequency of that stage of handwriting impairment differed significantly as compared to that of the illegible handwriting / $p < 0,01$ % /. Handwriting disorders were more frequent in women than in men, but the differences were not significant. The disorders of some basic activities as cutting food and handling utensils were frequently observed in male and female patients suffering from Parkinson’s disease - 193 patients / 69,2% /. Somewhat slowed and clumsy handling utensils and difficulties in feeding without any help needed were most frequent. These disorders were a little more frequent in women than in men. The need for the patients to be fed was observed least frequently – in 5 patients ($p < 0,05$ %)

Table 2: Frequency of impairment in handling utensils in Parkinson’s disease

Clinical symptom – stage of impairment	Gender men	Gender women	Total
Handling utensils, serving, cleaning	n %	n %	n %
0= normal			
1= somewhat slow and clumsy, but No help needed	37 28,6	56 34,3	93 31,7
2= can cut most foods slowly, Feed themselves though somewhat slow and clumsy, some help needed	28 21,7	36 21,9	64 21,8
3= food must be cut by someone, but the patient can still feed slowly	14 10,8	17 10,3	31 18,9
4= the patient needs to be fed	1 0,7	4 2,4	5 1,7
Total	80 62	113 68,9	193 65,8

Difficulties in dressing, like difficulties in handling utensils, were observed in almost three thirds of the patients - 195 /

66,5%/. Somewhat slow dressing where help is needed was the most frequently found symptom. It occurred considerably more frequently as compared to patients who needed assistance / $p < 0,05$ % /. Less frequent were the occasional and considerable help in dressing, but number and gender-related differences were not essential. The maintenance of personal hygiene is often difficult for patients with Parkinson’s disease. It was observed in 176 of our patients /6,0 % /.

Somewhat slow maintenance of personal hygiene prevailed, the cases being equally distributed between men and women – 54. It was much more frequent as compared to the use of mechanical devices / $p < 0,01$ %/ and slightly prevailed over the need for assistance for taking a bath – in 44 patients / 15%/ and washing, as well as brushing teeth and hair – 23patients / 7,8%/. Again there were no significant gender-related differences.

Like the impairment of the other activities of daily living, turning in bed presented some difficulties as well, and that symptom was very frequently observed in the patients studied - in 191 cases / 65,1%/. The mild stages prevailed – somewhat slow and clumsy turning in bed and adjusting bed clothes were the most frequently found symptoms. They were significantly different as compared to completely helpless patients / $p < 0,01$ %/.

About one third of the patients complained of falling, unrelated to “freezing”. Rare fallings in men and women were almost equal. Occasional falls on average once per day were the most frequent, while falls > once daily were the least frequent.

The phenomenon “freezing” when walking was found in 95 patients / 32,4 %/. Rare “freezing” when walking occurred most frequently, followed by occasional and frequent “freezing” when walking. Frequent falls resulting from “freezing” when walking were observed in only four of the women. No number and gender-related statistically significant differences were found. Walking disorders were very frequent. They were found in 203 of our male and female patients. / 69,2 % /,

Table 3: Frequency of walking disorders in Parkinson’s disease

Clinical symptom – stage of impairment	Gender men	Gender women	Total
Walking	n %	n %	n %
0= normal			
1= mild difficulty. May „swing” arms, may slip and drag legs	47 36,4	61 37,1	108 36,8
2= moderate difficulty, requires some assistance	29 22,4	35 21,3	64 21,8
3= severe disturbance of walking, assistance needed	15 11,6	12 7,3	27 9,2
4= cannot walk even with assistance	0 -	4 2,4	4 1,3
Total	91 70,5	112 68,2	203 69,2

Mild difficulties where the patient “swings” arms and slips were much more frequent – in 108patients / 36,8% / as

compared to the inability to walk even with assistance in 41,3% / $p < 0,01$ % /. Moderate and severe disturbances, requiring assistance were less frequently observed – in 64 / 21,8% / and 27 / 9,2% / of the patients studied respectively. Tremor is one of the main clinical symptoms in Parkinson's disease. It was observed in almost all of our patients - 274 / 93,1%/.

Table 4: Frequency of tremor in Parkinson's disease

Clinical symptom – stage of impairment	Gender men	Gender women	Total
	n %	n %	n %
0= absent			
1= slight and infrequently present	7 5,4	18 10,9	25 8,5
2= moderate, bothersome to patient	67 51,9	91 55,4	158 53,9
3= severe, interferes with many activities	40 31	42 25,6	82 27,9
4= marked, interferes with most activities	2 1,5	7 4,2	9 3
TOTAL	116 89,9	158 96,3	274 93,1

Moderate, bothersome to patients tremor was most frequently observed – in 158 patients /53,9% /, followed by severe tremor, which interferes with many of the patient's activities – in 82 patients/27,9%/. Their frequency increased significantly as compared to marked tremor, which interferes with most of the patient's activities -9 / 3% // $p < 0,01$ % and $p < 0,05$ % /. No gender-related significant differences were observed.

About 70 % of the patients had different degrees of sensory complaints. Most frequent was frequent numbness, accompanied with tingling and aching – in 94 patients / 32%/, followed by occasional numbness, tingling or mild pains - in 61 patients / 20,8% / and, more rarely, by frequent painful sensations – in 38 patients /12,9% /. No excruciating pains were observed in the men and women included in the study.

Table 5: Frequency of sensory complaints related to Parkinson's disease

Clinical symptom – stage of impairment	Gender men	Gender women	Total
	n %	n %	n %
Sensory complaints related to Parkinsonism			
0= absent			
1= occasional numbness, tingling and aching	29 22,4	32 19,5	61 20,8
= frequent numbness, tingling or aching, but not exhausting	46 35,6	48 29,2	94 32
3= frequent painful sensations	22 17	16 9,7	38 12,9
4= excruciating pain	--	--	--
Total	97 75,1	96 58,5	193 65,8

3. Discussion

Speech disorders in Parkinson's disease are characterized with monotonous, soft and breathy speech with variable rate and frequent looking for the suitable word, dysarthria, etc. /Sapir S, Spielman J, Ramig L, 2007/. Swallowing disorders have been described in a number of other studies /Potulska A, Friedman A, Krolicki et al 2003. The most typical

handwriting disorder is micrography, which is observed in a considerable group of the patients.

“Freezing” most frequently affects the legs when walking, but it can also affect the hands and the eyelids. It is usually manifested as a sudden and transient inability to continue walking, usually lasting less than 10 seconds. This symptom has considerable clinical and social consequences for patients mainly because it causes frequent falling./ Schaafsma J, Balash Y, Gurevich T et al 2003/.

These symptoms can be influenced by levopoda containing medications. Risk factors for the development of “freezing” include the presence of rigidity, bradykinesia, postural instability and longer disease duration. Except the dopaminergic therapy, the symptom has been treated with selegiline and Botulinum toxin injections as well, but the results have been unconvincing / Sheffield J, Jankovic J, 2007/.

Walking disorders have been examined in a number of other studies / Jankovic J, Tolosa E, 2007, Fahn S, Sethi K, 2008/. Essential tremor is considered to be a risk factor for the development of Parkinson's disease /Shahed J, Jankovic J, 2007/. In other cases orthostatic tremor may be the first manifestation of the disease. / Jankovic J 2002 /. There are several symptoms for diagnosing of essential tremor when it is concomitant to Parkinson's disease, which include familial tremor, tremor of head and voice, long evolution, etc. Many other studies emphasize the role of static tremor as a main clinical manifestation of Parkinson's disease / Bain P 2007, Edwards M, Quinn N, Bhatia K 2008, Elan D, Louis M, Gilberto L et al 2001, Leventoglu A, 2008.

Turning in bed and adjusting bed clothes become more and more difficult and even impossible for patients with Parkinsonism /Spildooren, Vercruyse S, Desloovere K et al. 2012, Plotnik M , Giladi N, Dagan Y , 2010/.

Many patients, suffering from Parkinson's disease often report about the presence of sensory disorders like pains, hyposmia and / Hawkes C, Del Tredici K, Braak K, 2010, Savica R, Rocca W, Ahlskog J 2010, Schapira A, Tolosa E 2010, Stamey W, Tinazzi M, Del Vesco C, Fincati e et al 2006/.

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