



# Shoulder Pain in Parkinson's Disease

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## ABSTRACT

**Objective:** To assess the frequency of shoulder pain among patients presenting to a tertiary clinic with Parkinson's disease (PD) or parkinsonism.

**Background:** Though an under-recognized early symptom, shoulder pain is common among patients with PD, and may precede classic motor symptoms, leading to diagnostic confusion. After extensive evaluation, invasive procedures, and treatments, many patients referred to our clinic have related that the symptoms of shoulder discomfort resolved only with pharmacological treatment of PD.

**Methods:** We searched our computerized database of new patient encounters for a 12 month period and rendered all history and physical documents into a Microsoft Word® file, screening each for a diagnosis of PD or other parkinsonian disorders. Records meeting these criteria were then searched for a complaint of shoulder discomfort, dysfunction, or injury, and evaluated for demographic and clinical data.

**Results:** The four movement disorder specialists in our clinic diagnosed parkinsonism in 479 patients, mean age 65 years (range 41-83, SD ±10.2). PD criteria was met in 317 patients. Though not systematically queried during the initial evaluation, 35 (11%) of the PD patients reported shoulder pain during the course of their symptoms (table 1), 77% of whom reported the side of shoulder pain agreed with side of maximum severity of parkinsonism, highly correlated at 0.5227 (p = 0.0013) (table 2). Bilateral shoulder pain was present in 4 (11%) patients, and only 5 (14%) individuals experienced pain in the shoulder opposite to the side of maximum parkinsonian symptoms. Among those PD patients with shoulder pain, 7 (20%) stated this was their presenting complaint.

**Conclusions:** In our retrospective analysis shoulder pain was present in 11% of patients with PD, a percentage most likely underestimated, as the complaint of shoulder pain was not specifically sought by protocol at examination, subject to recall bias, and often only included in a case history if volunteered. Despite these limitations, we believe shoulder pain is a common and frequently under-recognized or misdiagnosed symptom of early PD. Better understanding of this important symptom may not only lead to early diagnosis and prevention of unnecessary interventions, but may also provide insights into the prodromal period of PD. A prospective study in our clinic is under way to study the true frequency of this condition, as well as the response of these patients to anti-parkinsonian medications.

## INTRODUCTION

1. Shoulder complaints, such as "an intermittent, poorly localized, cramp-like or aching sensation,"<sup>1</sup> or "burning"<sup>2</sup> of variable severity have been reported in patients with PD, yet are still largely an under-recognized early symptom.
2. Patients referred to our clinic with these complaints have frequently related a variety of diagnoses and unnecessary invasive procedures, only to have symptoms of shoulder discomfort persist until pharmacological treatment of PD was initiated.<sup>2,3,4</sup>
3. During the 10 years prior to the onset of classical parkinsonism, "pre-PD" patients make twice as many visits to general practitioners, specialists and "other disciplines" compared with controls.<sup>5</sup>
4. Our study was designed to examine the frequency of shoulder complaints in our patients with PD and to draw attention to this common PD-related symptom.

## METHODS

We performed a retrospective analysis of all new patients evaluated for a complaint consistent with parkinsonism. Among those with shoulder pain, duration of parkinsonian symptoms, Unified Parkinson's Disease Rating Scale (UPDRS) part three (motor) scores and Hoehn and Yahr staging was obtained from the chart. If a patient was seen in follow-up, latest diagnosis was recorded for the study.

## RESULTS

PD was diagnosed according to the Gelb criteria.<sup>6</sup> Patients tended to have early to moderate disease severity, with a symptom duration of less than five years, and age was significantly correlated with both the H&Y and the UPDRS part 3 sub-score, as outlined in table 1. Patients with other forms of parkinsonism also reported shoulder pain (table 3). Patients with alternate forms of parkinsonism are listed in table 3, though notably no patients with multiple systems atrophy or corticobasal degeneration complained of shoulder pain and are thus not listed.

## DISCUSSION

1. The general complaint of pain is a common symptom in PD approximating 40% in most reports,<sup>1,7,8,9</sup> although the prevalence of shoulder pain is unknown.
2. Misdiagnoses such as bursitis, rotator cuff injury, tendonitis, stiff shoulder, frozen shoulder, and other orthopedic or arthritic conditions are common, reflecting the high prevalence of these disorders as compared with PD. In the general population, the prevalence of frozen shoulder, its estimate d to be between 3 and 5%;<sup>10</sup> whereas the prevalence of PD in industrialized countries is estimated to be 0.3% of the general population and close to 1% of the population older than age 60 years.<sup>11</sup>
3. The mechanism of shoulder pain in PD is not clear, though rigidity and bradykinesia, leading to immobility and subsequent shoulder dysfunction and discomfort is a possible scenario.
4. Low basal ganglia dopamine levels have been established in chronic pain syndromes via fluorodopa positron emission tomography (PET),<sup>12</sup> and influence pain thresholds.<sup>13</sup>

TABLE 1: Demographics of Parkinson's Disease patients with shoulder pain (n=35)

Characteristic	Mean (± SD)	Range
Age (years)	64.0 (9.61)	41 – 83
Parkinson's Disease Symptom Duration (years)	4.40 (4.07)	0 – 15
Hoehn and Yahr Score	2.38 (0.85)	1 – 5
Unified Parkinson's Disease Rating Scale – Part III (Motor Score)	24.9 (13.4)	3 – 54

TABLE 2: Distribution of Motor vs. Sensory Symptoms in Parkinson's Disease patients with shoulder pain. (n = 35)

Side	Maximum motor symptoms (%)	Men	Women	Painful shoulder (%)	Men	Women
Bilateral	1 (2.86)	1	0	4 (11.43)	3	1
Left	15 (42.86)	8	7	15 (42.86)	7	8
Right	19 (54.29)	11	8	16 (45.71)	10	6

TABLE 3: Non- Parkinson's Disease diagnoses of Parkinsonian patients with shoulder pain (n=12)

Diagnosis	Number with shoulder pain (%)	Total number of patients with this diagnosis during the period of study
Dementia with Lewy Bodies	4 (20.%)	20
Drug-induced parkinsonism	2 (10.%)	20
Vascular parkinsonism	2 (5.0%)	36
Psychogenic parkinsonism	2 (50.%)	4
Progressive Supranuclear Palsy	1 (3.7%)	27
Parkinsonism etiology unspecified	1 (14.%)	7

## CONCLUSIONS

Parkinson's disease and related disorders should be considered in patients presenting with shoulder pain, an early and important symptom of PD and parkinsonism.

## REFERENCES

1. Snider SR, Fahn S, Isgreen Wp, Cote LJ. Primary sensory symptoms in parkinsonism. *Neurology*.1976;26:423-429.
2. Hillen ME, Sage JI. Nonmotor fluctuations in patients with Parkinson's disease. *Neurology*.1996;47:1180-1183.
3. Gilbert GJ. Biceps pain as the presenting symptom of Parkinson disease: effective treatment with L-dopa. *South Med J*. 2004;97(8):776-777.
4. Quinn NP, Lang AE, Koller WC, Marsden CD. Painful Parkinson's disease. *Lancet*. 1986;1:1366-1369.
5. Gonera EG, van't Hof M, Berger HJC, et al: Symptoms and duration of the prodromal phase in Parkinson's disease. *Mov Disord*. 1997;12:871-876.
6. Gelb DJ, Oliver E, Gilman S. Diagnostic Criteria for Parkinson Disease. *Arch Neurol*. 1999;56:33-39.
7. Fahn S. Description of Parkinson's Disease as a Clinical Syndrome. *Annals of the New York Academy of Science*. 2003;991:1-14.
8. Riley D, Lang AE, Blair RDG, et al: Frozen shoulder and other disturbances in Parkinson's disease. *J Neurol Neurosurg Psych*. 1989;52:63-66.
9. Tinazzi M, Del Vecco C, Fincati E, Ottaviani S, Smania N, Moretto G, Fiaschi A, Martino D, Defazio G. Pain and motor complications in Parkinson's disease. *J. Neurol Neurosurg Psych*. 2006;77:822-825.
10. Harryman DT, Lazarus MD, Rozencaig R. The stiff shoulder. In: Rockwood C, Matsen F III, editors. *The Shoulder, volume 2*. Philadelphia. Saunders 1998;1064-1166.
11. de Rijk, M C; Launer, L J; Berger, K; Breteler, M M; Dartigues, J F; Baldereschi, M; Fratiglioni, L; Lobo, A; Martinez-Lage, J; Trenkwalder, C; Hofman, A. Prevalence of Parkinson's disease in Europe: A collaborative study of population-based cohorts. *Neurologic Diseases in the Elderly Research Group*. *Neurology* 2000;54(11):S21-S23.
12. Ja'a'skela'inen SK, Rinne OJ, Forssell H, et al. Role of the dopaminergic system in chronic pain: a fluorodopa-PET study. *Pain*. 2001;90:257-260.
13. Brefel-Courbon C, Payroux P, Thalamas C, Ory F, Quelven I, Chollet F, Montastruc JL, Rascol O. Effect of levodopa on pain threshold in Parkinson's disease: a clinical and positron emission tomography study. *Mov Disord*. 2005;20(12):1557-1563.