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Case Report Open Access

# Parkinson's Disease Associated with Myasthenia Gravis: A Case Report and Literature Review

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## Introduction

The prevalence of Parkinson's disease (PD) in the elderly population exceeds 1% according to recent reports, whereas myasthenia gravis (MG) is much rarer [1]. The expected prevalence of the combination of MG and PD can be grossly estimated to 3 cases per 6 million [2]. To our knowledge, since 1987, 12 cases of concurrent PD and MG have been reported [3]. We report a new case of PD associated with MG with update literature review.

## Case Report

A 73-year old man with a 20-year history of akineto-hypertonic form of Parkinson's disease, presented with fluctuating ptosis, diplopia, slurring of speech, dysphagia and general weakness of the neck, trunk and four limbs. These symptoms worsened during the course of the day but were better in the morning and after rest. On admission the patient was alert and orientated. General physical examination was unremarkable. On neurological examination, the strength of the neck extensors was reduced to 2/5 according to the Medical Research Council's score; the strength of both sternocleidomastoids was 3/5. All the remaining muscles were scored 5/5. Severe camptocormia, bradykinesia and rigidity were also noted. Routine blood and urine exams were unremarkable. Injection of Neostigmine dramatically improved his ptosis, slurred speech, dysphagia and muscle weakness. A typical decremental response was shown in deltoid and bilateral facial muscles on 3 Hz supramaximal stimulation. Serum acetylcholine receptor antibody (AChR Ab) titers were 17.3 nmol/l (normal <0.2 nmol/l) when antibodies to muscle-specific tyrosine kinase (MuSK) and antibodies against presynaptic voltage-gated calcium channels were negative. CT scan of the mediastinum revealed the presence of a thymus gland enlargement of 34 × 22 × 26 mm. On the basis of the above-mentioned clinical, immunological screening and neurophysiological findings a diagnosis of MG was established. The patient was treated only with pyridostigmine (120 mg/day). Remarkable improvement following treatment was reported.

## Discussion

Ueno was the first to describe a patient where PD and MG coexisted [4]. However, since then a possible link between PD and MG has been suggested in 11 more published cases [1-8]; their demographic and clinical characteristics are summarized in Table 1. Our patient is the thirteenth to be reported where these two medical entities coexist.

| Year | Author | Case/series | First diagnosis | Age at second diagnosis | Sex | Antibodies detected | MG presenting symptom |
|---|---|---|---|---|---|---|---|
| 1987 | Ueno et al. | Single case | PD | 60 | M | AChR(+) | Dropped head, ptosis, diplopia |
| 1993 | Kao et al. | Single case | PD | 62 | F | AChR(+) | Unilateral ptosis, diplopia, slurred speech and generalized weakness |
| 2003 | Levin et al. | Case #1 | PD | 76 | M | AChR(+) | Dropped head |
| | | Case #2 | PD | 62 | M | AChR(+) | Unilateral ptosis, lower limb weakness, diplopia, dysphagia and dyspnea |
| | | Case #3 | MG | 68 | F | AChR(+) | Limb weakness and ptosis |
| | | Case #4 | PD | 61 | M | No available | Bilateral ptosis |
| 2008 | Fasano et al. | Single case | PD | 58 | F | AChR(-) Anti-MuSK(-) | Dropped head |
| 2009 | Unal-cevik and Temucin | Single case | PD | 84 | M | AChR(-) | Dropped head |
| 2011 | Uldag et al. | Single case | PD | 75 | M | AChR(+) | Dropped head |

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|---|---|---|---|---|---|---|---|
| 2013 | Zis et al. | Single case | PD | 69 | M | AChR(+) Anti-MuSK(-) | Dropped head |
| 2014 | Leslie et al. | Case #1 | PD | 75 | F | AChR(+) | Weakness of the limbs and neck flexor muscles |
| | | Case #2 | PD | 72 | M | AChR(+) | Bilateral ptosis and ophtalmoplegia |
| 2016 | Beyrouti et al. | Single case | PD | 73 | M | AChR(+)<br>Anti-MuSK(-) | ptosis, diplopia, slurring of speech, dysphagia and general weakness of the neck, trunk and four limbs |

**Table 1:** Demographic and clinical characteristics of published data of patients suffering from PD and MG.

A male predominance, of approximately 2:1, has been observed [5]. The majority of the patients had a diagnosis of PD, and MG was diagnosed few years later. Only in one patient MG preceded PD [1]. Nine patients were positive for AChR antibodies, two were negative, and for one there is no information available.

PD and MG share some similar clinical symptoms that may overlap each other. The main clinical feature of MG is abnormal fatigue, caused by autoimmune mediated disturbance of neuromuscular junction. In PD fatigue represents a very common sign as well. The pathogenesis and etiology of fatigue remain still unknown. In spite of rare coexistence of PD and MG, it is inevitable to pay regard to their overlapping signs. Dropped head is a frequent initial sign in MG and can mimic anterocollis in PD. Head drop in PD results from cervical dystonia or camptocormia, whereas in MG it is induced by neck muscle weakness [6]. Additional symptoms that may occur both in PD and MG include dysphagia, dysarthria, "weakness" of facial muscles, which can imitate hypomimia in PD, myastenic ptosis resembling blepharospasm or motor fluctuation.

## Conclusion

One must be vigilant to not overlook another potentially treatable neuromuscular condition contributing to clinical deterioration in patients with PD. Motor power is not affected in PD and muscle weakness obligates a search for another neurologic explanation.

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