Urogenital Symptoms in Parkinson’s Disease and Multiple System Atrophy-Parkinsonism: At Onset and Later

Pazhayannur V Swaminath1, Mona Ragothaman1, Suma Koshy1, Nagaraja Sarangmath1, Mohan Adhyam2, DK Subbakrishna3, Christopher J Mathias4, Uday B Muthane1

Abstract

Methods: One hundred and eighty-one parkinsonian patients were evaluated to determine if urogenital symptoms at presentation to the Neurology clinic can differentiate them as PD or MSA-P. An autonomic questionnaire was used to document urinary and genital symptoms.

Results: Mean age at presentation and disease duration in PD and MSA-P were similar. Urinary symptoms occurred twice as frequently in MSA-P than in PD. Storage symptoms (frequency, urgency, urge incontinence, nocturia) were common in both Parkinsonian disorders. Male MSA-P reported genital symptoms (erectile and ejaculatory failure) three times more frequently than in PD.

Conclusions: Urogenital symptoms occurred in MSA-P when they had mild motor few symptoms unlike in PD where they occur when motor symptoms were severe. Urogenital dysfunction occurred early and was present in all MSA-P patients within two years. Presence of urogenital symptoms in early stages of Parkinsonism strongly favors MSA-P rather than PD. Absence of urogenital symptoms in advanced Parkinsonism makes MSA-P unlikely.

Introduction

Urinary and genital dysfunction is common in Parkinson’s disease (PD) and Multiple System Atrophy (MSA-P) and may occur either independently or with postural hypotension as part of autonomic failure. Estimates of urinary and genital dysfunction in PD and MSA are commonly reported from urology or neuro-urology departments and thus are likely to represent patients referred because of such symptoms. It is thought that urinary and genital dysfunction occurs early in MSA and late in PD but this has never been evaluated prospectively to know if this can distinguish PD from MSA-P in their early stages. We used a standard questionnaire to screen autonomic disorders including urogenital dysfunction in parkinsonian patients presenting to a neurology outpatient clinic to determine if this help distinguish PD from MSA-P in early stages of the disease.

Subjects and Methods

One hundred and eighty-one parkinsonian patients attending a neurology outpatient clinic were prospectively evaluated between July 2001 and March, 2004. All patients consented to participate underwent autonomic function testing and in due course were classified as PD or MSA-P using established clinical diagnostic criteria. The screening questionnaire used at the Neurovascular Medicine and Autonomic Units of St. Mary’s Hospital and The National Hospital for Neurology and Neurosurgery, Queen Square, London, UK was used to record urinary and genital symptoms. (Table 1). Patients with probable diagnosis of idiopathic PD and MSA-P were included in the final analysis. Severity of PD was staged using the Hoehn and Yahr (H & Y) scale. Exclusions were progressive supranuclear palsy, Parkinsonism with dementia, secondary Parkinsonism, and early onset PD (<40 years). Patients with diabetes mellitus, ischemic heart disease and cardiac arrhythmia were excluded, as these disorders may alter autonomic function and impair interpretation.

Symptoms were recorded using the International Continence Society consensus statement. Storage symptoms included, frequency (daytime urination >6-times), urgency, urge incontinence and nocturia (>1-time at night) while symptoms of impaired evacuation were delay in initiation (hesitancy), feeling of incomplete evacuation, straining to pass urine, thin or interrupted stream, stopping and starting. Each positive response received a score of ‘1’. The maximum score for urinary symptoms was 5 and for genital symptoms was 2 (Table 1).

Table 1 : Questionnaire for urinary and genital symptoms

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Yes</th>
<th>No</th>
<th>Duration in months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urgency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incontinence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nocturia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hesitancy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erectile failure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ejaculatory failure</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Received: 24.11.2008; Accepted: 21.04.2009
Combined urinary and genital symptoms occurred 3.5 times more often in MSA-P than in PD (70% vs. 19%).

Urinary Symptoms

Urinary symptoms were reported by 87% of MSA-P within a year of onset of motor symptoms and in all (100%) by the end of two years. (Fig. 1). Urinary symptoms were present in MSA-P even when they have mild parkinsonism (Hoehn and Yahr ≥ Stage 2.5, Fig 2) in contrast these symptoms occur in advanced PD with severe motor involvement ≥ Stage 4, (Fig.3).

**Fig. 1**: Frequency of patients reporting urinary symptoms with increasing duration of illness. Numbers above indicate patients at different duration of illness. There were no MSA patients with symptoms longer than 6 years.

**Fig. 2**: Patients having urinary symptoms with increasing severity of disease. Numbers above indicate patients in different stages of Parkinsonism.

Sample t-test was used to compare the mean age of patients and duration of symptoms in the two clinical groups.

**Results**

Hundred and eighty one parkinsonian patients (134 men and 47 women) were classified in due course into 150 PD (111 men and 39 women; 82.9%) and 31 MSA-P (23 men and 8 women; 17.1%). The age (mean ± sd) (PD: 57.4 ± 12 yrs, MSA-P: 60.2 ± 8 yrs; p=0.12, NS) and duration of motor symptoms (PD: 22.8±19.6 months, MSA-P: 20.4±14.7 months; p=0.52, NS) in the two groups were similar.

Urogenital Symptoms

Urogenital symptoms were reported by 60% of parkinsonian patients; urinary symptoms in 56% and genital symptoms in 33%. Urinary symptoms occurred twice as often in MSA-P (90.3%; Men: 91.3%, Women: 87.5%) than in PD (49.3%; Men: 53.2%, Women: 38.5%) (p<0.001). Male MSA-P (74%) reported 3-times higher frequency of genital symptoms (both erectile and ejaculatory failure) than male PD patients (24.5%)(p<0.001).

Combined urinary and genital symptoms occurred 3.5 times more often in MSA-P than in PD (70% vs. 19%).

Urinary Symptoms

Urinary symptoms were reported by 87% of MSA-P within a year of onset of motor symptoms and in all (100%) by the end of two years. (Fig.1). Urinary symptoms were present in MSA-P even when they have mild parkinsonism (Hoehn and Yahr ≥ Stage 2.5, Fig 2) in contrast these symptoms occur in advanced PD with severe motor involvement ≥ Stage 4, (Fig.3).

**Fig. 3** shows that nearly two-thirds of PD had a urinary score ≤ 2 (two symptoms) while all MSA-P with urinary symptoms had urinary scores ≥2. Storage symptoms were twice as common in MSA-P as compared to PD (90.3% vs 49.3%, p<0.001). Evacuation symptoms were 5-times more common in MSA-P than in PD (PD: 7.3% vs. MSA-P: 38.7%, p<0.001). In male patients, evacuation symptoms were five times more common in MSA-P than PD (MSA-P: 43.5% vs PD: 8.1%, p<0.001).
Fig. 3: Urinary scores in PD and MSA-P. Numbers above indicate frequency of patients with these scores and numbers below indicate number of PD/MSA.

Fig. 4: Genital symptoms with progressive duration of the disease. (*One male PD patient was excluded as he had primary hypogonadism.) Numbers above show patients at different durations.

Fig. 5: Genital symptoms with increasing disease severity. (*One male PD patient had primary hypogonadism). Numbers above indicate patients in different stages of Parkinsonism.
Table 2: Frequency of Urinary and genital symptoms in PD and MSA-P patients

<table>
<thead>
<tr>
<th>Urinary Symptoms</th>
<th>PD (150)</th>
<th>MSA-P (31)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased diurnal frequency</td>
<td>46 (31)</td>
<td>25 (80.6)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Increased nocturnal frequency</td>
<td>38 (25.3)</td>
<td>19 (61.3)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Urgency of micturition</td>
<td>49 (32.7)</td>
<td>25 (80.6)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Hesitancy of micturition</td>
<td>14 (9.3)</td>
<td>15 (48.4)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Urge incontinence</td>
<td>11 (7.3)</td>
<td>12 (38.7)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Genital symptoms</td>
<td>PD (n=110)</td>
<td>MSA-P (n=23)</td>
<td>P value</td>
</tr>
<tr>
<td>Erectile failure</td>
<td>27 (24.5)</td>
<td>17 (73.9)</td>
<td>P&lt;0.001</td>
</tr>
<tr>
<td>Ejaculatory failure</td>
<td>18 (16.3)</td>
<td>16 (69.5)</td>
<td>P&lt;0.001</td>
</tr>
</tbody>
</table>

Genital Symptoms

Erectile and ejaculatory symptoms occurred together in most male MSA-P (70%), but were present in few PD (16%) patients. More than 60% of MSA-P with one year of illness reported genital dysfunction and all did so by the fifth year (Fig.4), while only 50% of PD did so even after six years of illness. Genital dysfunction occurs more commonly in PD and MSA-P with increasing duration and severity of Parkinsonism (Fig.5, 6).

Discussion

In this study, the occurrence and type of urogenital dysfunction, in PD and MSA-P was compared at the first visit to a neurology clinic in the early stages of Parkinsonism. Urinary dysfunction occurred early in MSA-P and later in PD. Patients with both disorders report urinary symptoms suggestive of storage dysfunction. MSA-P commonly present with two or more urinary symptoms and genital dysfunction early in the illness.

Of the many autonomic features that may develop early in MSA, symptoms and signs of orthostatic hypotension (OH) often draws the clinician’s attention to the possibility that the parkinsonian disorder is MSA. However, urinary symptoms in MSA occur more often, and before symptoms of OH; urinary symptoms also occur more frequently in PD (39%) than in controls (10.8%).5,7 We observed that urinary and genital disturbances occur early in the course of illness (≤ 2yrs) in MSA-P compared with PD (≥5 yrs). When patients reported urogenital symptoms, parkinsonism was less severe in MSA-P than in PD. Obstructive symptoms occur in both PD and MSA but combined storage and obstructive symptoms is more common in MSA-P.

Genital symptoms occur in two-thirds of male MSA-P in the first year of illness while in PD they occurred much later (>6-yrs) (Fig. 6). This is consistent with a retrospective study by Kirchhof et al who reported that erectile and urinary symptoms might be presenting features of autonomic dysfunction in MSA in patients referred to a uro-neurological clinic and by inference were more likely to have such symptoms; no comparison was made with PD. In our study, genital symptoms were common in MSA-P (70%) than PD (16%). At the initial visit, combined rather than isolated erectile and ejaculatory dysfunction was common in both parkinsonian groups. Genital dysfunction was reported in 40% of males with advanced PD (H&Y stage >4) and, in contrast, by 60% of MSA-P with mild Parkinsonism (H&Y stage 2).

Our study in PD and MSA has been conducted in a large group of parkinsonian subjects at early stages of their illness. However, it has some limitations. Ideally, the two parkinsonian groups should have equal numbers, but this is acceptable as, in practice, MSA-P occurs less frequently than PD. Although the screening questionnaire recorded urinary and genital symptoms it was not intended to exclude the many other disorders occurring independently of direct autonomic impairment, especially at their age and cause similar symptoms. These include urinary tract infection, prostatic hypertrophy and medications. Non-autonomic factors accounting for erectile dysfunction, that include depression, were not formally addressed.

In this study we have used a clinical approach to assess urogenital disturbances that are directly relevant to neurological practice to determine distinguish PD from MSA-P. Our data suggests urogenital dysfunction early in a parkinsonian disorder favors a diagnosis of MSA-P rather than PD. Urogenital symptoms occur commonly in MSA-P even when the parkinsonism is mild, in contrast to PD where it remains less common even in severe parkinsonism. This study emphasizes the importance of a precise history in evaluating urogenital dysfunction in the early diagnosis of parkinsonism.

Acknowledgment: A “Collaborative Grant from the Wellcome Trust, UK” (DNEM PC1325) supported this work. We thank Mrs. Manjula Madan for maintaining the Autonomic database.

References


