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Atypical parkinsonism: Making the case for a neuropalliative rehabilitation approach

Category: Analysis

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Abstract

Background: Although atypical parkinsonism syndromes share some clinical features with the more common idiopathic Parkinson's disease, they also exhibit condition-specific symptoms, and have a shorter trajectory with a more consistent decline. There is an increasing awareness of the need for palliative care in non-cancer related diagnoses such as parkinsonism. A neuropalliative rehabilitation approach linking expertise in neurology, rehabilitation and palliative care in the proactive and collaborative management of long term neurological conditions, in particular those of shorter duration, is advocated, but appears difficult to achieve.

Content: This article presents the main clinical features of the key atypical parkinsonism syndromes - multiple system atrophy, progressive supranuclear palsy, corticobasal degeneration and dementia with Lewy bodies; identifies the 'red flags' that alert professionals to differentiate them from idiopathic Parkinson's disease; and discusses their multidisciplinary management within the context of neuropalliative rehabilitation.

Conclusion: Despite the publication of best practice guidelines, research highlights a marked lack of referral of people with atypical parkinsonism for palliative care. Earlier diagnosis and the timely employment of a neuropalliative rehabilitation approach is believed key to the successful management of the shorter and more steeply deteriorating trajectory of atypical parkinsonism syndromes.

Key words – atypical parkinsonism; multiple system atrophy; progressive supranuclear palsy; corticobasal degeneration; neuropalliative rehabilitation

INTRODUCTION

Whilst the progressive, neurodegenerative condition idiopathic Parkinson's disease (IPD) accounts for over 70% of all cases of the more general syndrome of parkinsonism – characterised by akinesia, rigidity and tremor – parkinsonism is associated with another group of progressive, neurodegenerative disorders whose clinical features differ from those found in IPD (Macphee, 2001). This grouping includes atypical parkinsonism ('parkinson-plus') syndromes such as multiple system atrophy (MSA), progressive supranuclear palsy (PSP) and corticobasal degeneration (CBD), together with a group of conditions where dementia may be prominent, such as dementia with Lewy bodies (DLB). Debate continues however as to whether IPD and DLB are actually different aspects of one entity (Aarsland et al, 2009). In addition to key differences in clinical features (Table 1), the trajectory of these conditions differs markedly from that of IPD and this necessitates different management strategies.

The progression of IPD can be characterised by four stages, although progression may not be linear: a diagnostic phase; a maintenance phase focused on the prevention of complications; a complex phase focused on the optimal management of medication; and a palliative phase focused on relief of symptoms and distress (MacMahon & Thomas, 1998). Unlike the 'prolonged dwindling' course of IPD, the atypical parkinsonism syndromes have a 'short period of steady decline' more in common with the terminal phase associated with a cancer trajectory (Murray et al, 2005). At diagnosis and in the early stages of a parkinsonism syndrome it can be difficult to distinguish between IPD and the atypical parkinsonism syndromes: often the non-parkinsonian features of these syndromes, the 'red flag' symptoms (Table 1), are not evident in very early disease. There can also be an initial modest, albeit variable, response to levodopa treatment in these conditions (Brooks, 2002). It is therefore vital that allied health professionals involved in the management of individuals with IPD and related disorders are aware of the 'red flag' symptoms that should prompt reappraisal of the initial diagnosis by the diagnosing clinician. There is an increasing focus on the need for palliative care in non-cancer related diagnoses such as parkinsonism, sharing as they do the need manage symptoms such as pain, constipation, respiratory and sleep problems (Saleem et al, 2013).

There is also increasing recognition of the importance of a rehabilitative component in combination with neurological and palliative care expertise to optimise management for people in the later stages of long term neurological conditions (Royal College of Physicians, National Council for Palliative Care, British Society for Rehabilitation Medicine, 2008). For those individuals with rapidly progressing neurological conditions and their families, well co-ordinated input from neurology, palliative care and rehabilitation services over a relatively short time course is imperative for best management. A neuropalliative rehabilitation approach describes team working at the intersection of neurological care (focusing on diagnosis, investigation and disease modification) with palliative care (including support for end-of-life decision making, advance care planning, advice and liaison, and management of distressing symptoms), and rehabilitation (including on-going medical and disability management, coordinated allied health multidisciplinary team (MDT) interventions, aids and equipment), with all disciplines providing support to the person and their family (Turner-Stokes et al, 2007).

By setting out the main features of the key atypical parkinsonism syndromes – MSA, PSP, CBD and DLB, this paper makes the case for a neuropalliative rehabilitative approach; it identifies the ‘red flags’ that should alert professionals to differentiate atypical parkinsonism syndromes from IPD; and discusses their multidisciplinary team management within the context of a neuropalliative rehabilitation ethos.

MAIN TYPES OF ATYPICAL PARKINSONISM

Multiple system atrophy

MSA is characterised by a combination of parkinsonian, cerebellar and autonomic features. Post-mortem examination reveals a high concentration of glial cytoplasmic inclusion bodies in the motor cortex and brain stem. It was first described in 1969 (Multiple System Atrophy Trust, 2014) and defined as three separate syndromes:

- Shy Drager, with the main features affecting the autonomic system

- Olivo-ponto-cerebellar atrophy affecting the cerebellar region (now classified as MSA-C)
- Striato-nigral degeneration involving the basal ganglia resulting in parkinsonian features (MSA-P).

Autonomic features occur in both MSA-C and MSA-P and are not usually defined as a separate sub-category. Diagnostic criteria were revised in 2008 and now include neuroimaging (Gilman et al, 2008). An MRI scan showing atrophy in the putamen, pons and/or cerebellum and the 'hot cross bun' sign on the pons would support the diagnosis (Massey et al, 2012).

Incidence of MSA is around 4-6 people per 100,000 – about 3,000 people in the UK and is 36-40 times less common than IPD. It affects both men and women usually in the 6th decade but can occur in people between 40 or 50 years old. Life expectancy is around 5-10 years with mean survival at 8 years.

Clinical features

Initial symptoms are often related to autonomic dysfunction with bladder disturbance such as nocturia and/or frequency, retention and recurrent urinary tract infections. Men often report erectile dysfunction as an early symptom. Orthostatic hypotension may cause symptoms of dizziness, blurred vision and 'coat hanger' pain (pain in the neck and shoulders). Further autonomic features include constipation, snoring, sleep apnoea, rapid eye movement (REM) sleep behaviour disorder, stridor, involuntary sighing, fainting, syncope, cold hands and feet, and inability to sweat.

Motor symptoms may mimic IPD, with bradykinesia, rigidity, postural instability, and tremor in around two thirds of cases, although this is often jerky than in IPD. Those presenting with these symptoms may be diagnosed with MSA-P, whilst people presenting with poor coordination, ataxic gait, and impaired balance may be diagnosed with MSA-C. Posture can be affected and a disproportionate antecollis (sustained forward flexion of the head and neck) (van de Warrenburg et al, 2007), and camptocormia (a condition characterised by the person with thoracolumbar forward flexion at an angle of at least 45° when standing or walking, but which resolves when the patient lies supine) (Doherty et al, 2011), can be features.

Speech is also affected and symptoms include, particularly for those with MSA-P, a quiet, slow, monotonous voice that is without emphasis, hypokinetic dysarthria, and speech festination. Those with MSA-C can present with slow, slurred, sometimes explosive speech and may have a croaky or a high-pitched, staccato voice. As the condition progresses, dysphagia becomes a prominent feature. Cognition is usually intact but individuals can report depression. Hallucinations are not usually present.

'Red flags' raising the possibility of a diagnosis of MSA (Table 1) are early falls (especially backwards), rapid progression of symptoms, camptocormia, disproportionate antecollis, stridor, unintentional sighing, dysphonia, dysarthria and emotional lability. Stridor in the daytime is less common in people who are still ambulant, but those experiencing night time stridor are at risk of sudden death and may therefore be offered continuous positive airway pressure (CPAC).

Progressive supranuclear palsy

PSP is characterised pathologically by tau protein-containing neurofibrillary tangles that are laid down in the basal ganglia and brain stem. MRI imaging shows midbrain atrophy that may be referred to as the 'hummingbird' or 'penguin' sign (Gröschel et al, 2006). PSP was first described in Steele, Richardson and Olszewski (1964). The cause is still unknown – it is possible that it may be linked to a virus that takes years to produce visible effects (as in Creutzfeldt Jakob Disease), a genetic mutation or environmental factors. Onset is usually in the 7th decade, and rarely before 45 or over 75. It affects slightly more men than women with at least 3,500 people affected in the UK. Mean duration from onset to death is 5.8 to 5.9 years (Maher and Lees, 1986).

Clinical features

Bradykinesia and rigidity, which is more prominent axially than proximally (akinetic rigid syndrome), with a slow gait, poor balance and falls (often backwards), are early features. Tremor may be present but is not common. Posture typically presents as rigid extension, especially in the cervical region. Eye movements, eye contact and blinking are reduced and eyebrows may be raised with retracted eyelids, resulting in a 'Mona Lisa' stare. The rate of blinking decreases from the normal of around 20 - 30

blinks per minute to between 3 - 5. Blurred vision, involuntary closing of the eyes and/or difficulty opening eyes may also be present. Speech is affected with reduced spastic vocal output and is commonly unintelligible by approximately 3.5 years (Goetz et al, 2003). Initiation of conversation is reduced, cognition and personality are altered, with poor memory, slow executive function, loss of interest in pleasurable activities, apathy, irritability, angry outbursts and forced laughing or crying as common features. Unlike MSA, hallucinations may be present in PSP. Many people with PSP display reckless behaviour that can result in falling due to a diminished sense of risk. Some experience 'utilisation behaviour' (e.g. putting on multiple pairs of spectacles or overloading of the mouth when eating). A positive 'applause sign' can help in the diagnosis of PSP (Dubois, 2005) in which the health professional claps three times, asking the patient to copy them. Typically people with PSP will continue to clap beyond three claps. Swallowing is also affected in PSP, and the risk of choking when eating or drinking rises as the condition progresses. Aspiration can lead to repeated chest infections and pneumonia.

'Red flags' for PSP (Table 1) are early backwards falls, motor recklessness and reduced eye movements, especially downwards.

Corticobasal degeneration

CBD is a rare disorder, first described by Rebeiz et al (1968). It is similar to PSP in that it is an akinetic rigid syndrome and a tau disorder but it is 10 times less common. It has no known cause. CBD affects the cortex and basal ganglia and imaging shows atrophy in the fronto-parieto-cortical area of the brain. Testing for the pout reflex, elicited by stroking or tapping the upper lip, and indicative of a frontal lobe disorder, can be helpful.

CBD usually presents in the 6th - 8th decade of life although the youngest confirmed case was 45 years. There is currently no research on prevalence in the UK (Progressive Supranuclear Palsy Association [PSPA], 2014a), but it is considered clinically less common than PSP. Men and women are equally affected, and death usually occurs 5 - 10 years after onset with mean survival of 7 years.

Clinical features

The main symptoms are unilateral bradykinesia, akinetic rigid syndrome, apraxia of one limb, involuntary movements (often myoclonic jerks), dystonia and dysphagia. Apraxia of one limb is the main feature and this is often described as an 'alien limb'. Gait is often preserved in the early stages and people diagnosed with the condition are less likely to fall than those with PSP or MSA; as the condition progresses however, gait disturbance will occur. Posture is similar to PSP with rigid extension.

Cognitive symptoms become more apparent with deterioration of the condition, and dysexecutive function, personality and behavioural changes, such as anxiety or irritability, become evident; hallucinations are not usually present. Short-term memory is affected and individuals may experience word recall problems and difficulty using correct language to express themselves. Speech becomes increasingly apraxic, however the ability to recite nursery rhymes may still be present. Pallilalia (involuntary repetition of words or phrases that may have no meaning) and echolalia (repeating back what has been said) may also be present.

Dementia with Lewy bodies

DLB is the most common cause of dementia after Alzheimer's. DLB is pathologically similar to IPD with the presence of intra-cytoplasmic inclusions (Lewy bodies) in the nuclei of neurones. In IPD the Lewy bodies are found predominantly in the substantia nigra but in DLB they are present widely within the deep cortical layers as well as the substantia nigra.

A clinical diagnosis of DLB requires the presence of progressive, disabling mental impairment along with fluctuating cognition, recurrent well formed visual hallucinations and spontaneous features of parkinsonism (McKeith et al, 2005).

Radiological features are not essential to the diagnosis of DLB, although diagnosis can be supported by an abnormal DaTscan (to distinguish from Alzheimer's) or occipital hypoperfusion on SPECT scanning (Lobotesis et al, 2001).

Clinical features

Cognitive dysfunction and visual hallucinations are often the presenting symptom of DLB though parkinsonism can sometimes be present initially, with cognitive problems and hallucinations becoming apparent on closer questioning. The pattern of cognitive decline in DLB differs from Alzheimer's in that rather than early issues with memory and orientation, DLB patients show early impairment in attention, executive and visuo-perceptual function (Collerton et al, 2003). Other predominant features of DLB include REM sleep behaviour disorder, neuroleptic sensitivity, syncope and transient loss of consciousness episodes, autonomic dysfunction, systematised delusions (e.g. commonly the house is not their home, spousal infidelity or the spouse is an imposter) and depression. 'Red flags' are the presence of hallucinations at diagnosis and fluctuating cognitive impairment.

Table 1 highlights the red flags that should alert clinicians to the possibility of a diagnosis of atypical parkinsonism as opposed to IPD.

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NEUROPALLIATIVE REHABILITATION APPROACH TO ATYPICAL PARKINSONISM

Due to the wide range of symptoms in atypical parkinsonism, MDT management using a neuropalliative rehabilitation approach is vital for both the diagnosed individual and carer. The approach also enables professionals from neurology, palliative care and rehabilitation to provide information and support to one another. With a mean survival time for individuals with these conditions of 5 - 10 years from onset of symptoms, it is vital that advice from specialist palliative care teams is available, at any stage after diagnosis and not just at the end-of-life. The main aims of the specialist palliative care team care are to provide symptom relief, prevent complications, minimise distress, maintain dignity and provide counselling. Referral to specialist palliative care services can be made for intractable symptoms causing distress, management of complex needs, difficulties with care co-ordination, specialist respite care and end-of-life decision making and planning. End-of-life care is part of an occupational therapy role (OT), using specific communication, liaison and coordination skills.

It is crucially important that advanced care planning is undertaken while people are still able to consider and communicate wishes and express preferences. Timely discussions regarding whether they would want hospital admission, resuscitation, artificial feeding and hydration, and where their preferred place of death would be are very important, both for individuals and families. Identifying that someone with one of these conditions is nearing the end of their life can be difficult. Indicators for end-of-life include swallowing problems, recurring infection, marked decline in physical status, first episode of aspiration pneumonia, significant weight loss and increasingly complex symptoms that are difficult to improve or manage.

The PSPA (2014b) has produced a care pathway guide that includes a 'map' of professionals and organisations who should be involved in supporting the person with PSP. The organisation has also published an updated Guide to PSP and CBD for Occupational Therapists and a Guide to Cognition for Health and Social Care Professionals (PSPA, 2014b). The overall goals of intervention are to maintain independence for as long as possible, support both the diagnosed individual and

carer and ensure prompt referral to outside agencies and support as required. In terms of medication, in the early stages, some individuals may benefit from levodopa but as the condition progresses, those who continue to benefit will be in the minority. Amantadine is sometimes used to treat MSA and PSP but evidence for its efficacy is limited (Warren and Burn, 2004).

Physiotherapy aims should include maintenance of muscle strength and joint range of movement, gait re-education and prevention or reduction of falls, which become increasingly likely as MSA and PSP progress. Reckless behaviour in PSP also contributes to the risk of falling, and sometimes equipment that would normally aid an individual can be a hazard, for instance, a stair lift could be a major risk. Those experiencing freezing of gait may benefit from cueing training but it is important to remember that reduced downward gaze in PSP renders visual cues on the floor less helpful. The need for appropriate walking aids needs to be regularly assessed and the U-Step (Attainability UK Ltd, 2014) reverse-braking walking frame may be helpful. The OT should be involved in assessing the home situation as early as possible after diagnosis so that as the disease progresses the appropriateness of equipment, e.g. for safe and supportive seating or transfers, can be continually assessed.

Increasing rigidity in the trunk and a progressive reduction of flexibility in PSP, problems of coordination in MSA and poor cognition in CBD and DLB, alongside the general parkinsonian symptoms, can make transfers increasingly difficult. Maintaining trunk flexibility with exercises and stretches is important and strategies can be taught to manage sit-to-stand and bed mobility (Zampieri and di Fabio, 2006). In CBD, avoidance of contractures and management of pain, especially of the affected hand, is important. . The OT will be ideally placed to signpost to support from outside agencies, and to monitor subtle changes in performance of activities of daily living that highlight deterioration and the need for the team to discuss changes in management strategies. They will also advise the individual and carer about using cognitive strategies during activities and around the home, and about the management of fatigue and mood, i.e. anxiety and depression. Provision of education, advice and support may enable the carer to manage with reduced stress.

Orthostatic hypotension is a feature of MSA and it is important to understand the effect of exercise and other factors on those with this condition as symptoms can be made worse by exercise, position, high carbohydrate intake (i.e. straight after a large meal), dehydration, alcohol, straining on the toilet, warm weather and side effects of medication. Case studies have described the benefits of exercise (mainly treadmill training) as improving balance and gait in people with PSP (Suteerawattananon et al, 2002). Treadmill training combined with stretches and strengthening led to an improvement in balance and decreasing falls' incidence in a person with mixed PSP and CBD features (Steffen et al, 2007). Follow up of this individual after 10 years of twice weekly participation in a one hour long therapy-led community based exercise class for people with Parkinson's disease demonstrated maintenance of mobility, reduction of falls and slower-than-expected rate of brain volume loss over time (Steffen et al, 2013). The timing of exercise however needs to be considered carefully, avoiding early morning and late evening. Raising the head end of the bed 15° can improve symptoms on waking, as can encouraging salt and fluid intake. Calf pumping and advice on changing position, e.g. from sit to stand, can also help.

Management of DLB with its fluctuating cognition and prominent neuropsychiatric features is difficult. Levodopa can be helpful in improving motor function but is likely to exacerbate psychiatric symptoms, likewise the use of antipsychotics to control neuropsychiatric and behavioural symptoms will worsen parkinsonism. The Acetylcholinesterase inhibitor, Rivastigmine, which can control hallucinations and improve cognition, along with low dose levodopa is helpful, with the novel, atypical antipsychotics (quetiapine, clozapine, aripiprazole) being used only where there is significant delusion or challenging behaviour (McKeith et al, 2005). In the early stages of DLB exercises, cues and strategies can be helpful, but in the later stages it is imperative to involve the carers in management strategies as cognitive function declines and poor short-term memory impedes therapeutic carry-over. It is important that the OT advises on the impact of fluctuating cognition and its severity. Memory strategies should be given to the individual early on in the condition. The OT would also be able to provide education about hallucinations and how to manage them on a daily basis.

Speech therapy is essential from the outset in atypical parkinsonism syndromes in order to maximise communication, and, as swallowing problems progress, a

percutaneous endoscopic gastrostomy (PEG) might need to be considered. Stridor in MSA may indicate a tracheotomy is required, but individuals and their families need to consider the impact on quality of life and potential complications.

DISCUSSION

Because parkinsonism is so strongly associated with the symptoms and trajectory pattern of IPD, obtaining optimal management and service provision for the much less common but more rapidly progressive forms of atypical parkinsonism can often prove problematic. It is important for all members of the MDT involved with individuals with movement disorders to be aware of the 'red flags' that would alert them to the need to consider a diagnosis of atypical parkinsonism. Their shorter timescale means that the neurorehabilitation approach most associated with IPD coalesces with the need for a palliative approach. However it is important to note encouraging evidence of the effect of regular exercise on disease progression (Steffen et al, 2013).

It would appear that the recommendation in the National Guidelines on 'Long-term neurological conditions: management at the interface between neurology, rehabilitation and palliative care' (Royal College of Physicians, National Council for Palliative Care, British Society of Rehabilitation Medicine, 2008), that a person with a long term neurological condition should be referred to specialist palliative care services if they have a limited lifespan (6-12 months), and/or distressing symptoms, and/or the need or desire for end-of-life planning, is not being acted upon. Parkinson's disease clinics with a focus on palliative care are being set up (Ghoche, 2012), but none of the participants in a study to assess symptom prevalence, severity and palliative care needs in patients with parkinsonism (N=82: IPD 58.5%, MSA 22%, PSP 19.5%) had been referred to palliative care services (Saleem et al, 2013). This is particularly disappointing in relation to the 42% of participants with atypical parkinsonism syndromes.

Patient-reported outcome measurement is becoming increasingly important in healthcare metrics. Saleem et al (2013) used the patient report Palliative Outcome

Scale (POS) (Hearn and Higginson, 1999), which asks about 10 items assessing physical symptoms, emotional, psychological and spiritual needs, and provision of information and support, and the Patient Outcome Scale – Parkinson’s Disease (POS-PD), which records 20 symptoms particularly relevant to palliative care in Parkinson’s disease, both measured over the past 2 weeks (0 best – 4 worst), to assess symptoms and palliative care needs. In this cross-sectional study, the mean age of participants was 67 years, mean Hoehn and Yahr (1967) disease staging score was 4.1, and mean disease duration 9.6 years. The total POS mean score was 14, suggesting moderate palliative care needs; a mean of 11 physical symptoms were reported on the POS-PD. As disease stage progressed number of symptoms and palliative care needs increased. Reported symptom prevalence was similar to those with advanced cancer for pain, fatigue, constipation, breathlessness, sleep problems and nausea. As more clinicians and researchers focus on specialist management of these symptoms in parkinsonism so the complexity of symptoms grows. People with parkinsonism can report different types of pain to that experienced in the general population, often reporting more than one type of pain, with a variety of properties e.g. musculoskeletal, dystonic and radicular-neuropathic pain, a complexity similar to advanced cancer populations (Ghoche, 2012). This finding points to the need for more research on symptom management in parkinsonism in the context of a neuropalliative rehabilitation approach.

CONCLUSION

This article has focused on atypical parkinsonism syndromes and the need for an integrated neuropalliative rehabilitation approach. Despite its longer trajectory with a slower decline, a palliative care phase will be encountered in people with IPD, and MDT members should consider how best to collect and share information about symptoms that would indicate that palliative care planning and active palliative care management is appropriate in all individuals with progressive, neurodegenerative parkinsonism.

KEY POINTS

1. Atypical parkinsonism syndromes have an illness trajectory with a shorter, more consistent decline, more akin to a cancer trajectory, than to the gradual decline of IPD
2. There is an increasing awareness of the need for palliative care in non-cancer related diagnoses such as parkinsonism
3. Knowledge of key 'red flags' can alert professionals to differentiate atypical parkinsonism syndromes from IPD
4. A neuropalliative rehabilitation approach is key to the successful management of atypical parkinsonism syndromes
5. Despite best practice guidelines there is a lack of referral of people with parkinsonism for palliative care

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CONFLICT OF INTEREST

FL is related to the UK distributor of the U-Step.

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Table 1 'Red flags' for identifying idiopathic and atypical parkinsonism syndromes

Idiopathic Parkinson's Disease	Multiple system atrophy¹	Progressive supranuclear palsy²	Corticobasal degeneration³	Dementia with Lewy bodies⁴
Unilateral onset of symptoms	Symmetrical symptoms, rapid progression	Reduced eye movements, especially downwards	Reduced coordination/function in one upper limb	Hallucinations at diagnosis
Presence of slowness of repetitive finger taps with fatigueable decrement	Early falls, often backwards	Early falls, often backwards	Cognitive dysfunction	Fluctuating cognitive changes
Presence of a resting tremor	Disproportionate antecolles	Motor recklessness	Pout reflex	Impairment in attention, executive and visuo-perceptual function
Presence of unilateral reduced arm swing	Camptocormia	'Mona Lisa' stare	Pallilalia	Parkinsonian features e.g. tremor, rigidity bradykinesia, shuffling gait which respond less well to levodopa treatment
Postural instability but usually no falls at diagnosis and early disease	Autonomic dysfunction	Positive applause sign	Echolalia	
Good response to levodopa treatment	Stridor	Cognitive changes		
	Snoring	Behavioural changes		
	Involuntary sighing	Emotional lability		
	Emotionally labile			

	¹ <i>Also known as:</i> <ul style="list-style-type: none"> ▪ <i>Shy Drager</i> ▪ <i>Olivo-ponto-cerebellar atrophy (MSA-C)</i> ▪ <i>Striato-nigral degeneration (MSA-P)</i> 	² <i>Also known as: Steele-Richardson-Olszewski syndrome</i>	³ <i>Also known as: Corticobasal ganglionic degeneration (CBGD)</i>	⁴ <i>Also known as:</i> <ul style="list-style-type: none"> • <i>Lewy body dementia</i> • <i>Diffuse Lewy body disease</i> • <i>Cortical Lewy body disease</i> • <i>Senile dementia of Lewy type</i>
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