Singapore general practitioners' awareness of atypical features in early Parkinson's disease

Tan J H

ABSTRACT

Introduction: Parkinson's disease (PD) accounts for 75 percent of cases with parkinsonism. 25 percent of parkinsonian patients have alternative and possibly treatable conditions. Early intervention of these conditions lies in the physician's awareness and recognition of atypical features in patients presenting with parkinsonism. This survey studies Singapore general practitioners' (GPs) ability to identify atypical features and alternative diagnoses in patients suspected of having early PD.

Methods: 41 out of 57 GPs attending a local symposium participated in a written questionnaire which had the following outcome measures: the ability to identify neurological features that are atypical in early-stage PD; and the awareness of alternative parkinsonian conditions, other than PD.

Results: The mean age of the GPs was 56.0 years (standard deviation [SD] 10.4 years), with 36 males and five females. A mean of 1.6 PD patients were under the care of each GP. Only 33 percent (SD 16 percent) of GPs were aware of atypical features in early PD. If the early atypical feature was one that may occur in late-stage PD, the GPs' awareness was even lower at 19 percent (SD 14 percent). 32 percent of GPs were unable to provide any alternative diagnosis to parkinsonism.

Conclusion: This survey suggests a poor level of awareness among Singapore GPs on the identification and presence of alternative parkinsonian conditions. Continuing medical education programmes on PD should emphasise on the diagnostic approach to patients with parkinsonism and the impact of missing the diagnosis of treatable parkinsonian conditions.

Keywords: atypical parkinsonism, continuing medical education, general practitioners, Parkinson's disease, parkinsonism

Singapore Med J 2007; 48(4):338–341

INTRODUCTION

Parkinson's disease (PD) is the commonest cause of parkinsonism,[1,2] but pathological studies show that 25% of parkinsonian syndromes belong to alternative diagnoses.[3,4] There are grave implications in misdiagnosing potentially-treatable parkinsonian conditions as PD. Early recognition and management of normal pressure hydrocephalus, Wilson's disease, vascular parkinsonism and drug-induced parkinsonism may halt disease progression or even reverse neurological damage. The clinical diagnosis of PD is based on the presence of cardinal and supportive features. A large component of the diagnosis rests on the recognition of atypical features to exclude alternative conditions.[5–8] In Singapore, PD is managed at various healthcare levels, with 80% of primary healthcare services being provided by private general practitioners (GPs). This survey studies the GPs' awareness of atypical features in early PD and alternative diagnoses for parkinsonism.

METHODS

57 GPs who attended a local PD and movement disorders symposium were invited to participate in an anonymous written questionnaire. 41 GPs returned their questionnaire forms at the end of the symposium. The following data were obtained from each participant: the GP's age, gender and number of PD patients under the GP's care. The GPs were provided with two written questions. Question 1 consisted of a stem stating that a 60-year-old patient had presented to the GP with parkinsonian features which started one year earlier. 19 neurological features were then given (Table I), of which four were cardinal PD features or features typical of a diagnosis of early PD. The other 15 were atypical of early disease and consisted of either "red flags" that were obtained from exclusion lists in various clinical diagnostic criteria for PD[5–8] or late-

Division of Neurology, Department of Medicine, National University Hospital, 5 Lower Kent Ridge Road, Singapore 119074

Tan JH, MRCP
Consultant

Correspondence to:
Dr Joo-Hui Tan
Tel: (65) 6772 4259
Fax: (65) 6872 3566
Email: june_tan@nuh.com.sg

Table I. General practitioners' awareness of clinical features in early Parkinson's disease.

Clinical features in early PD	Number of correct responses (%)	Awareness level
Typical in early PD		
Limb bradykinesia	32 (78)	Good
Lead pipe rigidity	28 (68)	Good
Unilateral resting hand tremor	25 (61)	Average
Normal MRI brain	23 (56)	Average
Atypical in early PD		
Visual hallucinations	23 (56)	Average
Polyneuropathy	21 (51)	Average
No response to levodopa 600 mg/day	20 (49)	Average
Nystagmus	20 (49)	Average
Restricted downward gaze	17 (41)	Average
Positive Babinski sign	16 (39)	Average
Incontinence	14 (34)	Average
Dysmetria	14 (34)	Average
Myoclonus	13 (32)	Poor
Dementia	13 (32)	Poor
Postural hypotension	12 (29)	Poor
Limb apraxia	10 (24)	Poor
Dysphagia	6 (15)	Poor
Freezing gait	2 (5)	Poor
Frequent falls	1 (2)	Poor

MRI: Magnetic resonance imaging

stage PD features (visual hallucinations, severe dementia, dysphagia, postural hypotension, incontinence, freezing gait, frequent falls). Being atypical of early disease, the presence of these features in a patient suspected of having early PD warrants a reconsideration of the diagnosis. These features were listed randomly for the GPs and they were asked to specify whether each feature was typical or atypical of early PD. The GPs' awareness level for each feature was divided into three groups: Good, 67%–100% GPs correctly categorised this feature; Average, 34%–66%; Poor, 0%–33%. Question 2 requested the GPs to provide, in a free text manner, two alternative diagnoses to parkinsonism other than PD. Non-specific or vague answers (e.g. degenerative disease, dementia) and nil responses were marked as incorrect. The answers were marked by a single neurologist.

RESULTS

The mean age of the GPs was 56.0 years (standard deviation [SD] 10.4 years; range 36–80 years), with 36 males and five females. Five GPs did not reveal the number of PD patients they had under their care, and the mean and median for the responders were 1.6 and one patient, respectively (range, 0–10 patients). The results for Question 1 (Table I) showed an average-to-good level of awareness among the GPs (mean 65.8%; SD 9.5%; range 56%–78%) in identifying cardinal or typical features of early PD. The awareness of the 15 early atypical features was poor-to-average (mean 33.0%; SD 15.7%; range 2%–56%). Apart from visual hallucinations, there was particularly poor knowledge (mean 19.5%; SD 14.1%; range 2%–32%) of the fact that late-stage PD features are atypical in early PD. In Question 2 (Table II), 32% of GPs could not give any correct alternative diagnosis for parkinsonism. This included 16 answer slots that were left blank by nine GPs. 21% provided one correct answer and 49% gave two correct answers. The correct answers obtained from the GPs consisted of seven conditions, the commonest answers being vascular and drug-induced parkinsonisms (44% and 41% of GPs, respectively).

DISCUSSION

The clinical distinction of atypical parkinsonian disorders (APDs) from PD may be difficult in the early stages of disease.[4] This is so even among experienced PD experts, where alternative diagnoses consisting mainly of APDs were found in 8% of patients that they initially diagnosed as having PD.[9] In addition, 12% of pathologically-confirmed PD cases have atypical features,[10,11] and this contributes to the inaccuracies of clinical diagnosis.

Table II. Causes of parkinsonism obtained from GPs.

	Number of GPs (%)
Correct answers	
Vascular parkinsonism	18 (44)
Drug-induced parkinsonism	17 (41)
Postencephalitic parkinsonism	5 (12)
Brain tumour	4 (10)
Recurrent head trauma/boxers	3 (7)
Alzheimer's disease	2 (5)
Wilson's disease	1 (2)
Incorrect answers	
Nil answer(s)*	9 (22)
Dementia	6 (15)
Hypertension	2 (5)
Degenerative disease	2 (5)
Diabetes mellitus	1 (2)
Neuropathy	1 (2)
Incontinence	1 (2)
Lead pipe rigidity	1 (2)
Alcoholism	1 (2)
Fits	1 (2)

*9 GPs left one or both answer slots blank, giving a total of 16 blank answer slots.

Hence, this survey is not aimed at assessing the GPs' knowledge of rare PD features. Instead, it studies the GPs' awareness of obvious and well-established atypical features that are used in the exclusion list of numerous clinical criteria for PD.[5–8] The purpose of providing and highlighting a clinical scenario of early-stage PD in Question 1 is two-fold. Firstly, it focuses on the knowledge that late-stage PD features are atypical in early disease, as their presence warrants a review of PD as the diagnosis. Secondly, it emphasises the importance of identifying atypical features early in the course of the disease. This would minimise delay in the identification and management of potentially treatable conditions.

In Question 1, a chronic dose of 600 mg levodopa per day was set as an arbitrary limit for levodopa-responsiveness. In the literature, both acute levodopa challenge tests and chronic therapy have been used to assess levodopa-responsiveness as a supportive feature for PD. However, in a primary care setting, it would unlikely be feasible to carry out an acute challenge test in a GP's clinic, as it entails several hours of close monitoring for response and side effects. In addition, a systematic review showed that the acute challenge test does not add further predictiveness of PD diagnosis compared with a therapeutic trial of chronic levodopa.[12] Based on these reasons, chronic levodopa therapy was chosen for this survey instead of the acute challenge test. The diagnostic criteria for PD do not specify the dose and duration of chronic levodopa therapy used to fulfill the requirements of being "levodopa-responsive". The various trial and recommendations, used chronic levodopa therapy doses at a range of 300–1500 mg per day as the limit for "levodopa-responsiveness".[13–16] Therefore, for practical purposes, this study sets 600 mg per day as a reasonable cut off dose to reconsider PD as the diagnosis among our Asian patients in a primary care setting.

Most GPs correctly identified the three cardinal features of PD. Postural instability has at times been listed as a cardinal feature of PD, but its presence is rare in early stages and is thus categorised as an atypical early feature in this study. Among the three cardinal features, unilateral resting hand tremor received the lowest score. This is surprising, as resting tremor is readily recognisable and often the main sign that prompts a diagnosis of PD. The author's personal communication with GPs revealed the general belief that because PD is a "non-structural brain disease", bilateral symmetrical motor signs are to be expected. Unilateral predominance in early stages is not widely known among the GPs. Of note was the poor awareness of time course in the progression of PD clinical features. The results for Question 1 suggested that most GPs could identify dementia, dysphagia, postural hypotension, frequent falls and freezing gait as features of PD, but were unaware that these were atypical in early stages. Knowledge of the natural disease progression is crucial because cross-sectional or single time-point application of PD clinical criteria on a parkinsonian patient is unreliable in forming a diagnosis.[17] A history of symptom-onset is required regardless of how advanced the patient is in the disease progression.

Question 2 reflects how a physician would clinically approach a patient with parkinsonism. Without the fundamental knowledge of differential diagnoses in parkinsonism, which seems to be the case in a third of the GPs, no attempt may be made to seek for atypical features and alternative diagnoses. Among the correct answers given by the GPs, conditions that were easily recognisable clinically, e.g. vascular and drug-induced parkinsonisms, were the most frequently named. However, there was a notable absence of the APDs, which are usually the most challenging conditions to distinguish from PD. Only two GPs gave the non-specific answer of "degenerative disease" which might be postulated as attempts to name the APDs. This may either be due to unfamiliarity of this group of conditions, or the difficulty in recalling their long complex names (e.g. progressive supranuclear palsy, multiple system atrophy, corticobasal degeneration, dementia with Lewy bodies). It may be argued that early distinction of incurable APDs is of low priority since these conditions have a less favourable prognosis than PD. On the contrary, early APD recognition is important

for patient counselling and provides an opportunity to anticipate and prevent disease-specific complications.

The limitations of this questionnaire, as is with any written survey, include the participants' misinterpretation of questions despite great care taken during its formulation. For instance in Question 2, the participants were asked to provide causes for parkinsonism, but a few answers pertaining to clinical features (e.g. "rigidity" and "incontinence") were given instead. A pre-survey trial run with feedback from GPs may minimise misinterpretation in future larger surveys. The reluctance to disclose the number of PD patients the GPs have under their care also undermines the true implications of this survey. Furthermore, written knowledge of parkinsonian features in a survey cannot completely represent the physician's ability to identify alternative diagnoses in a true clinic setting. Time constraints in a busy private practice may restrict the clinical application of this knowledge. Lastly, the small sample size of this survey may not truly reflect the level of knowledge among the more than 2,000 registered GPs in Singapore.

What can be done to improve the clinical diagnosis of parkinsonian syndromes at the primary care level? Singapore has a 4.3 million gradually-ageing population and a PD prevalence of 0.3% among those aged 50 years and above.[18] It would be neither feasible nor cost-effective for all parkinsonian patients to be managed by the handful of movement disorders specialists in Singapore. A practical approach would be to provide our primary care physicians and GPs with the clinical skills necessary in the approach to a parkinsonian syndrome. This can be achieved through continuing medical education (CME) programmes, especially bedside teaching and demonstration of signs, and the formulation of clinical practice guidelines for parkinsonism. Current CME programmes on PD for primary care physicians in Singapore tend to emphasise on treatment choices for PD. Based on this survey, more pertinent and basic issues on the diagnosis of PD itself can be highlighted. These include the clinical process involved in diagnosing PD, the natural progression of PD symptom onset, the awareness of atypical features and implications of missing alternative diagnoses.

ACKNOWLEDGEMENTS

The author thanks the general practitioners who participated in this written questionnaire.

REFERENCES

1. Rajput AH, Offord KP, Beard CM, Kurland LT. Epidemiology of parkinsonism: incidence, classification, and mortality. Ann Neurol 1984; 16:278-82.
2. Hoehn MM, Yahr MD. Parkinsonism: onset, progression and mortality. Neurology 1967; 17:427-42.
3. Hughes AJ, Daniel SE, Kilford L, Lees AJ. Accuracy of clinical diagnosis of idiopathic Parkinson's disease: a clinico-pathological study of 100 cases. J Neurol Neurosurg Psychiatry 1992; 55:181-4.
4. Rajput AH, Rozdilsky B, Rajput A. Accuracy of clinical diagnosis in parkinsonism – a prospective study. Can J Neurol Sci 1991; 18:275-8.
5. Calne DB, Snow BJ, Lee C. Criteria for diagnosing Parkinson's disease. Ann Neurol 1992; 32 suppl:S125-7.
6. Ward CD, Gibb WR. Research diagnostic criteria for Parkinson's disease. Adv Neurol 1990; 53:245-9.
7. Gelb DJ, Oliver E, Gilman S. Diagnostic criteria for Parkinson disease. Arch Neurol 1999; 56:33-9.
8. Gibb WR, Lees AJ. The relevance of the Lewy body to the pathogenesis of idiopathic Parkinson's disease. J Neurol Neurosurg Psychiatry 1988; 51:745-52.
9. Jankovic J, Rajput AH, McDermott MP, Perl DP. The evolution of diagnosis in early Parkinson disease. Arch Neurol 2000; 57:369-72.
10. Hughes AJ, Daniel SE, Blankson S, Lees AJ. A clinicopathological study of 100 cases of Parkinson' disease. Arch Neurol 1993; 50:140-8.
11. Mark MH, Sage JI, Dickson DW, Schwarz KO, Duvoisin RC. Levodopa-nonresponsive Lewy body parkinsonism: clinicopathologic study of two cases. Neurology 1992; 42:1323-7.
12. Clarke CE, Davies P. Systematic review of acute levodopa and apomorphine challenge tests in the diagnosis of idiopathic Parkinson's disease. J Neurol Neurosurg Psychiatry 2000; 69:590-4.
13. D'Costa DF, Sheehan LJ, Phillips PA, Moore-Smith B. The levodopa test in Parkinson's disease. Age Ageing 1995; 24:210-2.
14. Hughes AJ, Lees AJ, Stern GM. Challenge tests to predict the dopaminergic response in untreated Parkinson's disease. Neurology 1991; 41:1723-5.
15. Zappia M, Montesanti R, Colao R, et al. Short-term levodopa test assessed by movement time accurately predicts dopaminergic responsiveness in Parkinson's disease. Mov Disord 1997; 12:103-6.
16. Gasser T, Schwarz J, Arnold G, Trenkwalder C, Oertel WH. Apomorphine test of dopaminergic responsiveness in patients with previously untreated Parkinson's disease. Arch Neurol 1992; 49:1131-4.
17. Lachenmayer L. Differential diagnosis of parkinsonian syndromes: dynamics of time courses are essential. J Neurol 2003; 250 suppl 1:I11-4.
18. Tan LC, Venketasubramanian N, Hong CY, et al. Prevalence of Parkinson disease in Singapore: Chinese vs Malays vs Indians. Neurology 2004; 62:1999-2004.