Prevalence of Parkinsonism and its aetiological subtypes within patients with movement disorders

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Abstract

Objective: Determine the prevalence of Parkinsonism and its aetiological subtypes within patients attending a movement disorder clinic at the National Hospital of Sri Lanka (NHSL).

Methodology: A hospital based descriptive cross-sectional study was carried out at the movement disorder clinic of ward 63, NHSL. Seventy consenting participants were recruited to the study by systematic sampling. They were assessed to diagnose Parkinsonism and its aetiological subtypes by an interviewer administered questionnaire, systematic clinical examination and using clinic and other medical records where available.

Results: Forty seven out of seventy participants (67.14%) were males and 51 of them (72.86%) were above sixty years. Sixty out of seventy participants (85.71%) had Parkinsonism while the rest had other movement disorders. Out of Parkinsonism patients 41 (68.33%) were males and 49 (81.66%) were above sixty. Thirty two (53.33%) of the Parkinsonism patients had Idiopathic Parkinsonism, eleven had Vascular Parkinsonism (18.33%), seven had Drug Induced Parkinsonism (11.66%), one had Progressive Supranuclear Palsy (1.66%), none had Multiple System Atrophy and nine (15.0%) had doubtful diagnoses.

Conclusions: Parkinsonism is the commonest movement disorder among patients attending the movement disorder clinic at NHSL. When considering patients with movement disorders, prevalence of Parkinsonism is high in males (SND = 2.84, P value < 0.01) and in the age group above sixty (SND = 4.91, P value < 0.01). The commonest aetiological subtype of Parkinsonism is Idiopathic Parkinsonism, followed by Vascular Parkinsonism and Drug Induced Parkinsonism.

Introduction

During the evolution of knowledge on neuroanatomy and neurophysiology, nineteenth-century anatomists, physiologists and neurologists established the importance of the pyramidal pathway. Nevertheless they later recognized that pathology outside this system also led to major disturbances of voluntary movements (1). Pathologies outside the pyramidal system are known as extra-pyramidal diseases and Parkinsonism is an important category identified within it.

Parkinsonism or 'Parkinson's syndrome' is defined as the presence of two or more signs from the four categories of signs — bradykinesia, gait disturbance, rigidity, and tremor (2,3). This common progressively disabling disease has a number of subtypes based on the aetiology (3-9). They include Idiopathic Parkinson's disease (the commonest type), Drug Induced Parkinsonism, Vascular Parkinsonism, Multiple System Atrophy and Progressive Supranuclear Palsy (4).

Prevalence is an important determinant of the magnitude of the health impact related to any disease. Unfortunately there is no sufficient data available regarding prevalence of Parkinsonism in Sri Lanka. According to published data, Parkinsonism is a rare disease with an overall average annual incidence of 20.5 per 100,000 population and estimated prevalence of 300 per 100,000 population in the USA, and in the Sicilian population the crude prevalence is 371.5 per 100,000 (5,6,8). A large scale community based study done in East Boston, Massachusetts stated that the overall prevalence estimates for Parkinson's syndrome was 14.9% for people 65 to 74 years of age, 29.5% for those 75 to 84 and 52.4% for those 85 and older. Overall risk of death over a given period among people with Parkinsonism was 2.0 times higher (95% CI 1.6-2.6)

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than among people without it. Among people with Parkinsonism, the presence of gait disturbance was associated with an increased risk of death (2). Parkinsonism is a disease of the elderly. This makes it an important disease for our health sector as Sri Lanka has a growing elderly population. The proportion of old age population has increased by 2.5% during the period from 1981 to 2001 (11). In addition Parkinsonism is a chronic disabling disease as well. So availability of data regarding this disease is essential at the administration level of health care services to plan health care services of the country

Diagnosis is the most difficult step in the management of Parkinsonism. Even experienced neurologists often find it difficult to diagnose the early stages of Parkinson's disease accurately (12). Treatment of Parkinson's syndrome is primarily symptomatic. Currently available symptomatic treatment to Parkinsonism syndrome has dramatic improvement of symptoms at the commencement of therapy, but these patients are well known to develop resistance or non-responsiveness to available treatments (13). Although the treatment is primarily symptomatic, identification of the specific subtype and underlying cause influences the management (7). Therefore prevalence data regarding various subtypes of Parkinsonism in this country is required as there is no or very little data available.

Methods

A hospital based descriptive cross-sectional study was carried out at the movement disorder clinic of ward 63 of the NHSL. Sampling method of the study was systematic sampling. Assessment of every other patient including the first patient who came to the clinic was done during 7.00am to 9.00am in seven consecutive clinic days by using an interviewer administered questionnaire, structured clinical examination and using clinic and other medical records where available. This gave the maximum possible sample size (70) with neither any disturbance to the clinic work nor repetitions. Ethical clearance was given by ethical review committee of the NHSL.

Diagnosis of Parkinsonism and of its subtypes were done by using internationally accepted criteria which have been successfully used in previous studies in other countries (2,4,7,9). Parkinsonism was diagnosed by presence of two or more Parkinsonism signs, which are bradykinesia, rigidity, gait disturbances and tremors.

Diagnostic criteria for Parkinsonism

1. Bradykinesia diagnosed if at least two of the following are present: paucity of movements of the extremities, paucity of movements of the face or slow finger taps.

2. Rigidity diagnosed if rigidity was present in two out of four limbs.

3. Gait disturbances diagnosed if at least two of the following were present: reduced arm swing, shuffling gait or prolonged turning.

4. Tremors diagnosed if tremor was present in any of the limbs at rest.

Diagnostic criteria for aetiological subtypes of Parkinsonism

1. Idiopathic Parkinson's disease was diagnosed according to the criteria of the UK Parkinson's Disease Society Brain Bank (Table 01).

2. Multiple System Atrophy was diagnosed according to criteria defined by the Consensus Committees representing the American Autonomic Society and the American Academy of Neurology in 1996 and 1998 (Table 02).

3. Progressive Supranuclear Palsy was diagnosed according to clinical research criteria by National Institute of Neurological Disorders and Stroke (NINDS) Society for PSP conference (Table 03).

4. Vascular Parkinsonism was diagnosed if at least two of the following were present: History of strokes, abrupt onset with stepwise progression, hypertension, wide based gait with small steps, cognitive decline, pseudobulbar or pyramidal signs.

5. Drug induced Parkinsonism diagnosed if a dopamine receptor blocking drug had been started within six months of the onset of symptoms and taken for at least six months.

Results were analysed using chi-square test and standard normal distribution (SND) using SPSS© version 15 for Windows.

Table 1: Diagnostic criteria for Idiopathic Parkinson's disease

Step 1: Diagnosis of Parkinsonism Bradykinesia and at least one of the following needed.
• Muscular rigidity • 4–6 Hz resting tremor • Postural instability not caused by primary visual, vestibular, cerebellar or proprioceptive dysfunction
Step 2: Features tending to exclude Parkinson's disease as the cause of Parkinsonism.
• History of repeated strokes with stepwise progression of Parkinsonian features • History of repeated head injury • History of definite encephalitis • Neuroleptic treatment at onset of symptoms • >1 affected relatives • Sustained remission • Strictly unilateral features after 3 years • Supranuclear gaze palsy • Cerebellar signs • Early severe autonomic involvement • Early severe dementia with disturbances of memory, language and praxis • Babinski sign • Presence of a cerebral tumour or communicating hydrocephalus on computed tomography scan • Negative response to large doses of Levodopa (if malabsorption excluded) • MPTP exposure
Step 3: Features that support a diagnosis of Parkinson's disease (three or more required for diagnosis of definite Parkinson's disease).
• Unilateral onset • Rest tremor present • Progressive disorder • Persistent asymmetry affecting the side of onset most • Excellent (70–100%) response to Levodopa • Severe Levodopa-induced chorea • Levodopa response for ≥5 years • Clinical course of ≥10 years

Table 2: Diagnostic criteria for Multiple System Atrophy

Clinical Domain: Autonomic and urinary dysfunction	
Features	Defining Feature
• Orthostatic hypotension (decrease by 20-30 mm Hg systolic, 10-15 mm Hg diastolic within 3 min of standing) • Urinary incontinence as persistent, involuntary, partial or total bladder emptying • Erectile dysfunction in men	Orthostatic hypotension and/or urinary incontinence, with erectile dysfunction in men
Clinical Domain: Parkinsonism	
• Bradykinesia (slow voluntary movements with progressively reduced speed and amplitude with repeated actions) • Rigidity • Postural instability not caused by primary visual, vestibular, cerebellar or proprioceptive dysfunction • Tremor (postural, resting, or both)	Bradykinesia plus at least 1 other Parkinsonism feature
Clinical Domain: Cerebellar dysfunction	
• Gait ataxia (wide-based stance with steps of irregular length and direction) • Ataxic dysarthria • Limb ataxia • Sustained gaze-evoked nystagmus	Gait ataxia plus at least 1 cerebellar feature

Table 3: Diagnostic criteria for Progressive Supranuclear Palsy

• Gradually progressive disorder with onset when the individual is aged 40 years or older • Either vertical supranuclear palsy or both slowing of vertical saccades and prominent postural instability with falls in the first year of onset. • No evidence of other diseases that can explain the clinical features

Results

Forty seven (67.14%) out of seventy participants were males. Fifty one of them were above sixty years (72.86%). Sixty out of seventy participants had Parkinsonism (85.71%) while others had other movement disorders. (Figure 1)

Out of Parkinsonism patients 41 (68.33%) were males and 49 (81.66%) were above sixty (Figure 2). Distribution of aetiological subtypes within the sixty Parkinsonism patients is shown in Figure 3.

Figure 1: Percentage distribution of cases of Parkinsonism by gender within the study sample (n = 70)

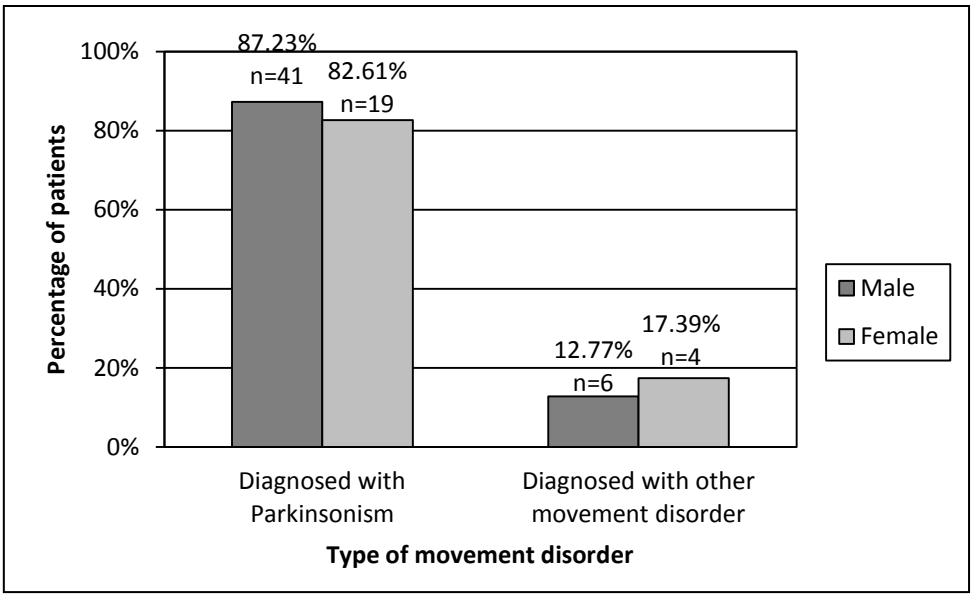


Figure 2: Percentage distribution of cases of Parkinsonism by age within the study sample (n=70)

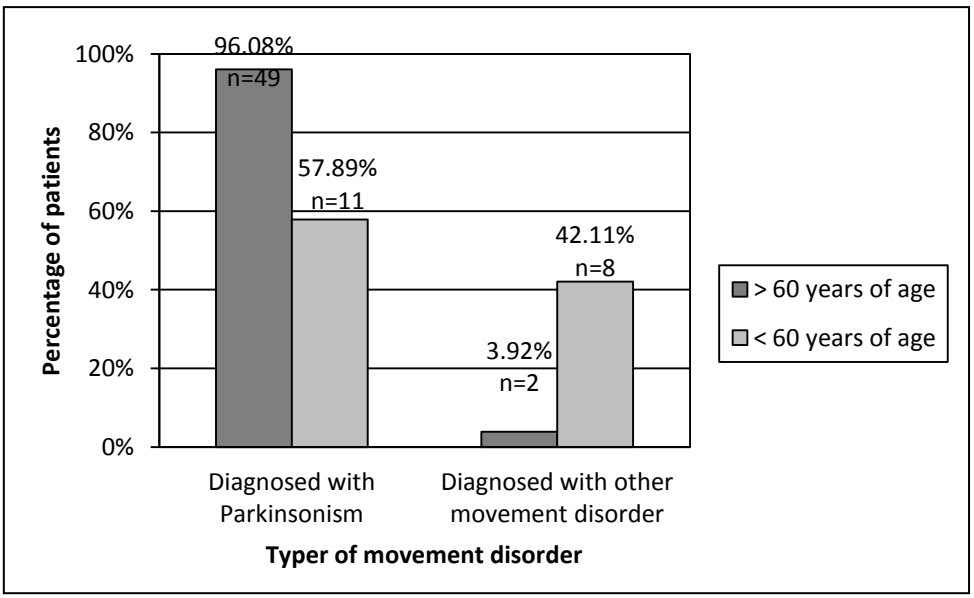
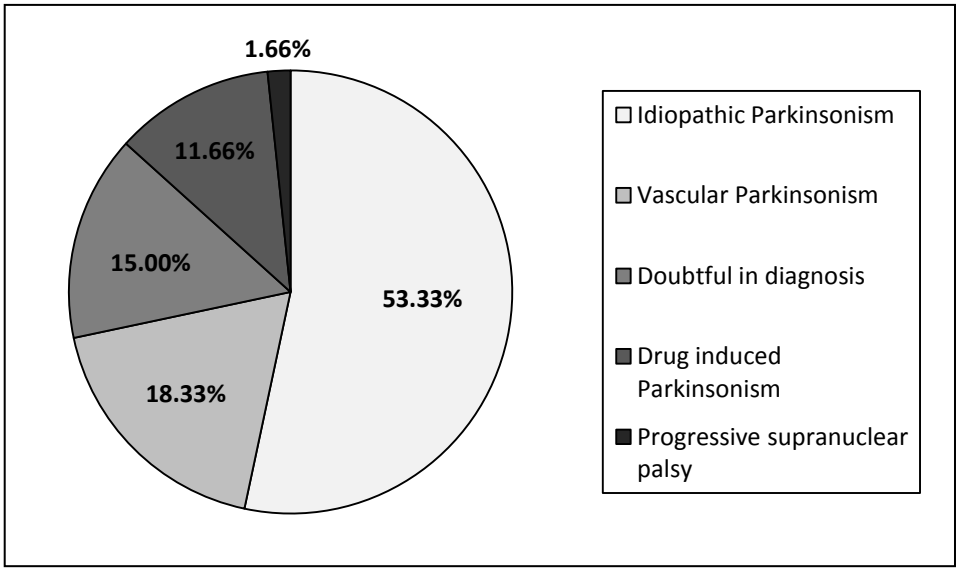


Figure 3: Distribution of aetiological subtypes within Parkinsonism patients



*Multiple system atrophy did not occur within this sample

Discussion

Parkinsonism was very common (85.71%) among patients attending the movement disorder clinic at NHSL. In our study population, Parkinsonism was higher in males than females (SND = 2.84, p value < 0.01) with a male to female ratio of 2.16 : 1. This opposes the findings of the epidemiological study on Parkinsonism conducted in the USA over a period of 13 years which revealed no sex difference in Parkinsonism (5). Another study conducted among Sicilian population revealed an inconsistent sex pattern (6). Prevalence of Parkinsonism increased with age as 96.08% of the patients above sixty had Parkinsonism as compared to 57.89% among those below sixty years of age. This observed difference is also significant (SND = 4.91, p value < 0.01). This result is consistent with the findings of other studies on Parkinsonism (5,6,8). Although the frequency was less than that of the above sixty age group, below sixty age group also had higher frequency of Parkinsonism (57.89%) compared to other movement disorders, but this observation was not significant (SND = 1.22, p value > 0.05).

Most common aetiological subtype of Parkinsonism was Idiopathic Parkinsonism (53.33%). It was followed by Vascular Parkinsonism (18.33%) and drug induced Parkinsonism (11.66%). These findings are similar to the findings in other studies (5,6).

Conclusions

Parkinsonism is the commonest movement disorder among patients attending the movement disorder clinic at NHSL.

The commonest aetiological subtype of Parkinson's syndrome among patients with movement disorders is idiopathic Parkinson's disease and it comprises more than half of the Parkinsonism patients. Vascular Parkinsonism and Drug Induced Parkinsonism are also important aetiological subtypes of Parkinsonism in the same population.

Prevalence of Parkinsonism is known to be higher in males and in the age group of above sixty (14). Findings of this study also support male sex and increasing age as risk factors for Parkinsonism.

As this study was done on a selected population and on a small sample these findings need to be substantiated by a more comprehensive study.

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