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MOTOR AND NON-MOTOR FEATURES OF PARKINSON'S DISEASE
W. B. P. Matuja, MBChB, MRCP, Neulorogy Unit, Department of Internal Medicine and E. A. Aris, MD, MMed, Neulorogy Clinic, Muhimbili University College of Health Sciences, P. O. Box 65001, Dar es Salaam, Tanzania

Request for reprints to: Prof. W. B. P. Matuja, Neulorogy Unit, Department of Internal Medicine, Muhimbili University College of Health Sciences, P. O. Box 65001, Dar es Salaam, Tanzania

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W. B. P. MATUJA and E. A. ARIS

ABSTRACT

Background: **Parkinson's disease (PD) is a common neurodegenerative brain disease in developed countries where population of the elderly is high. PD is increasingly being documented in developing countries where there are rapid demographic changes. Motor features of PD have been documented in Africans in previous studies. However non-motor features such as depression and sleep disturbance have not been well documented.**
Objective: **To study the motor and non-motor features of idiopathic Parkinson's disease in Tanzania.**
Design: **A descriptive consecutive referral of patients to the national tertiary care hospital.**
Setting: **Neurology clinic at Muhimbili National Hospital a major teaching and national referral hospital.**
Results: **Forty two of 1,908 (2.2%) new referral patients over four years of study satisfied the criteria for idiopathic PD. Of these 25 (59.5%) were males and 17 females. There was no significant difference between sex, in demographic and clinical features. Nevertheless females tended to be older; and the majority of whom were housewives. Three male patients were in advanced stage five and six or UPDRS above 61/108. Thirty nine(92.8%) patients completed BDI and none of these had a BDI score of more than ten. Insomnia was reported in 14(33%) of patients. There was no significant difference between age, sex, clinical stage or UPDRS score. However 12 (28.6%) of 42 patients had been noted to have at least one sleep behaviour disorder and all had mild to moderate disease at stages one to three or UPDRS score of 60/108 or less.**
Conclusion: **Idiopathic Parkinson's disease is increasingly being seen in Tanzania due to the ageing population. Majority of patients in this series were in early stage of disease. Depression was conspicuously absent. However sleep behaviour disorder, which is potentially harmful to the patient, bed partners and requires different management, was a common feature that was elicited by direct enquiry in patients with Parkinson's disease.**

INTRODUCTION

Parkinson's disease (PD) is a progressive degenerative disorder of the nervous system of obscure cause. The prevalence of PD is lower in Africans at a rate of about 67 per 100,000 population in comparison to developed countries where it is around 200 per 100,000 population (1). PD is generally age-specific affecting about 10% population over 60 years but does also occur in young people who constitute appropriately 10% patients who develop symptoms before the age of 50 years. Non-motor features of PD like depression and sleep disturbances were observed and well described in detail by Sir James Parkinson in his monograph (2). This observation was also underscored by later studies that found depression to be present in 30-50% of patients with PD depending on the methodology

used (3,4). Awareness of sleep disorders in PD has been growing recently (5,6). Sleep disorders are now regarded as important features among non-motor symptoms in PD.

Parkinson's disease has generally been rare in Africans but with the recent trend of increase in ageing population in developing countries more age-related diseases like PD are increasingly being encountered in clinical practice. We were not aware of any studies on PD in Tanzania. We have studied a cohort of newly referred patients at the neurology clinic, Muhimbili National Hospital, a teaching and national referral hospital which also serves as the referral hospital to Dar es Salaam city.

In this observation study we report the severity of motor features and the presence of depression and sleep disturbance in African Tanzanians with PD seen at neurology clinic over a four year period (1st July 2002 to 30th June 2006).

MATERIALS AND METHODS

Consecutively referred patients to the neurology clinic at Muhimbili National Hospital with tentative diagnosis of movement disorder and memory dysfunction were seen by the authors. All patients underwent a normal history evaluation which included mode of onset of movement disorder or memory dysfunction, antecedent events, family and social history. A mini mental test score was administered for dementia screening (7). Routine auxiliary investigations were ordered. including VDRL test, full blood count and ESR, thyroid function tests and CTScan of the head.

Case definition: Idiopathic Parkinson's disease was defined as the presence of bradykinesia with one or more motor features in the absence identifiable cause or dementia.

Inclusion criteria: Idiopathic PD included the presence of bradykinesia with at least one or more other cardinal features. These were rigidity, rest tremor, or postural instability in the absence of identifiable secondary cause of PD .

Exclusion criteria: Included presence of dementia (MMTS score of 23 or less), patients with identifiable cause of Parkisonism syndrome. Patients who satisfied the inclusion criteria of idiopathic PD were subjected to further evaluation by one of the authors WBPM after they were informed of the possible diagnosis. This evaluation included thorough neurological examination, assessment of the severity of motor symptoms using Unified Parkinson's Disease rating scale-UPDRS (motor II and III) that contained 27 items with each item rating from zero (normal) to four (severely affected) with minimum score 0 (normal) to 108 (severely affected) (8). Patients were further staged using the modified Hoehn and Yahr staging (9) where 1.5 is equivalent to two while two and a half and three became four, making stage range of zero to six patients were requested and assisted in completing the 21-item Beck's Depression Inventory. Patients with BDI score of 11 and above were classified as having depression. Insomnia was enquired from patients and from bed partners. Insomnia was defined as a delay in initiating sleep for any estimated period of more than 30 minutes in sleep onset on average of at least more than four days in a week. Enquiry was made from spouses or bed partners if they have observed any one of the six features of sleep behaviour disorders manifested as either screaming, grasping, punching, kicking, crying or jumping out of bed during sleep. Spouses or bed partners who had not observed these features were requested to do this within two weeks from the time of enrolment into the study. Patients were also asked whether they had experienced vivid dreams in the last three months .

A past treatment with Levo-dopa and anticholinergics was recorded. Data were entered in computer software SPSS 11.0. Frequency and cross tabulation was done. Data analysis was determined and results obtained by Chi square test.

RESULTS

Forty two patients (2.2%) of all 1,908 new consecutive referrals over the four year period satisfied the criteria for idiopathic Parkinson's Disease (PD). The age range was from 40 to 78 years with mean of 61.5 years. Twenty nine patients (69%) of 42 patients were aged between 51–70 years of age. Twenty five patients (59.5%) were males and 17 were females (Table 1). The age distribution between sexes did differ slightly with a tendency of males being younger. Five (25%) of the males were 50 years and below while only one female out of 17 was 50 years (Figure 1). The mean age was statistically significant between sexes but the numbers are too small to make meaningful conclusions (Table 1).

Table 1
Demographic and clinical characteristic of Parkinson's disease

Characteristic	Males (n=25)	Females (n=17)	P-value
Age range	40-78	60-72	
Mean age	58.4	66	<0.05
Occupation			
Peasant/Housewife	7	16	
Artisan	10	0	
Professionals	8	1	<0.05
Family history	0	0	
Past history of head injury	0	0	
Smoking	2	0	
Duration of symptoms (years)			
< 1	6	5	
< 2	5	2	
< 3	6	4	
< 4	4	3	
< 5	1	2	
> 5	3	1	
Clinical stage			
1-2	8	7	
3	10	5	
4-6	7	5	<0.05
UPDR score range	23-100	27-57	
<30	7	3	
31-60	15	14	
61-100	3	0	
Sleep behavioural disorder	7	5	
Beck's depression inventory score			
Range	5-8	3-9	
Mean score	7	8	

UPDR=United Parkinson's Disease Rating Scale

Eleven (26.2%) of patients had symptoms for more than one year. Seventeen (40%) had symptoms from one year to three years and only four patients (9.5%) had symptoms for six years or more (Figure 2).

Fifteen patients (35.7%) were classified as clinical stage one and two. Twenty three (54.7%) were in stage three and four while only three (all males) were in stage five and six (Figure 3).

There was no difference in distribution between sex and clinical stage except for a small difference in stage three where females outnumbered males while in stage five and six all three patients were males (Table 1). There was no difference in duration of the symptoms and clinical stage of the disease. Three patients were on levodopa or anticholenergic therapy before referral and were in clinical stages 5 and 6.

Ten patients (23.8%) had a score of 30 and below on the total 108 UPDRS, 29 patients (69%) had a score of 31 to 60 and three patients had a

score above 61. Insomnia was present in 14 (33%) and there was no difference in the distribution in age, sex clinical stage or UPDRS. Day time sleep attacks were reported only in three male patients (7%) who were also on Levodopa before referral.

Figure 1
Age and sex diagnosis of Parkinson's disease

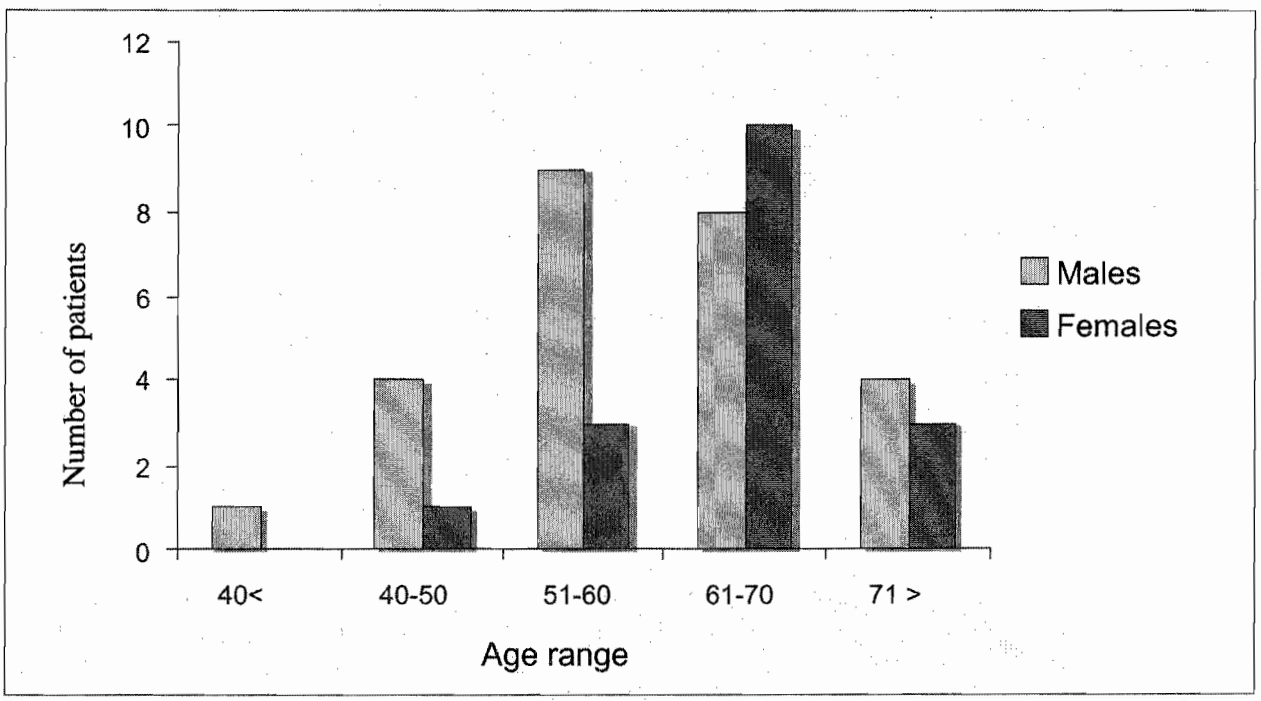


Figure 2
Duration of onset of symptoms

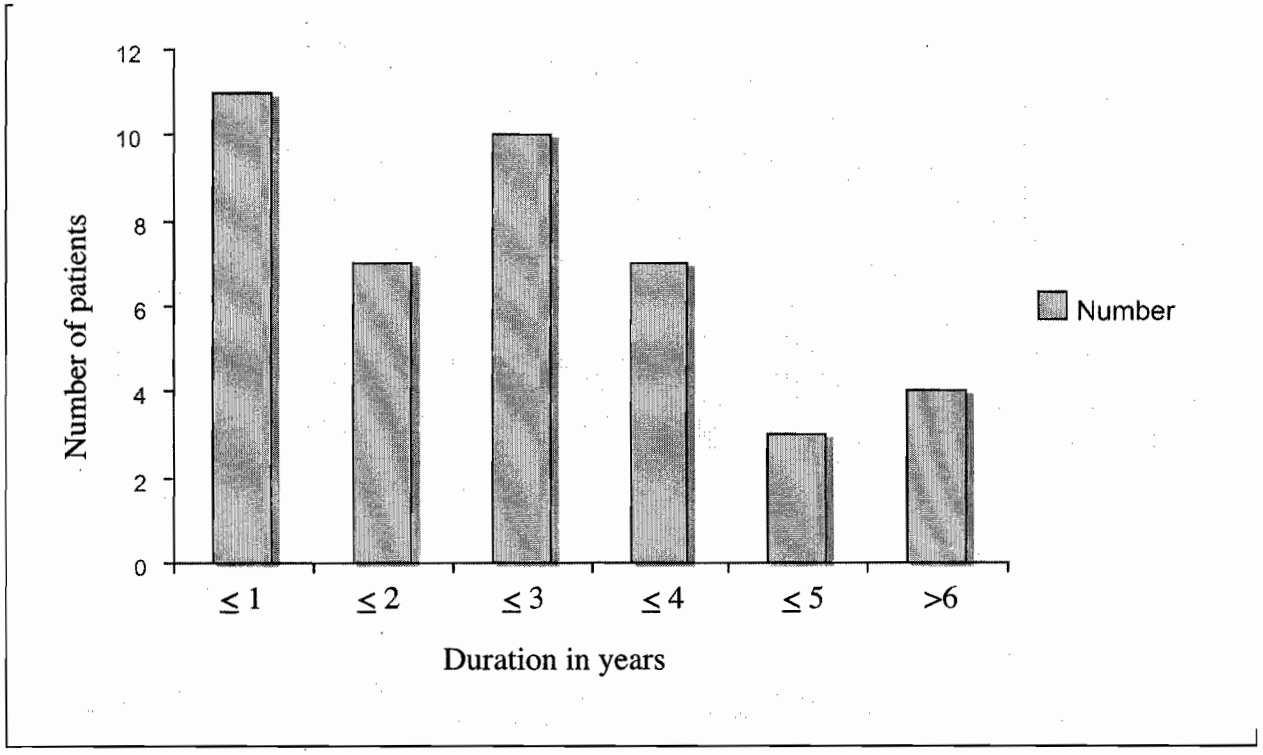


Figure 3
Clinical stage of PD

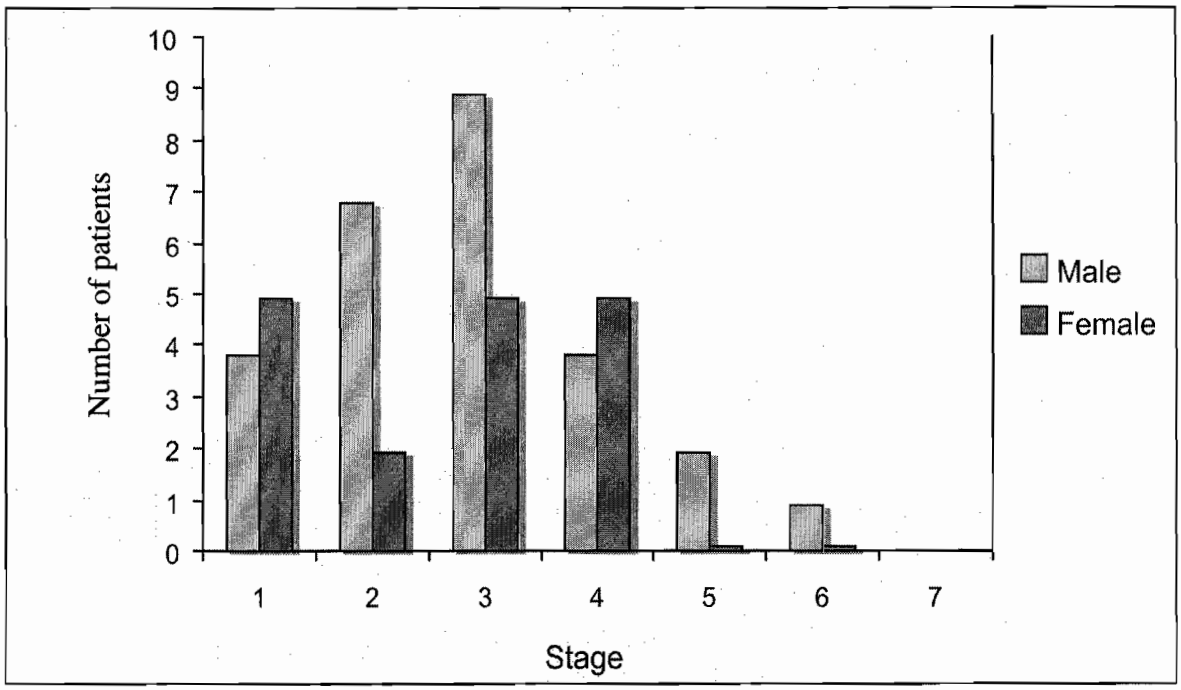
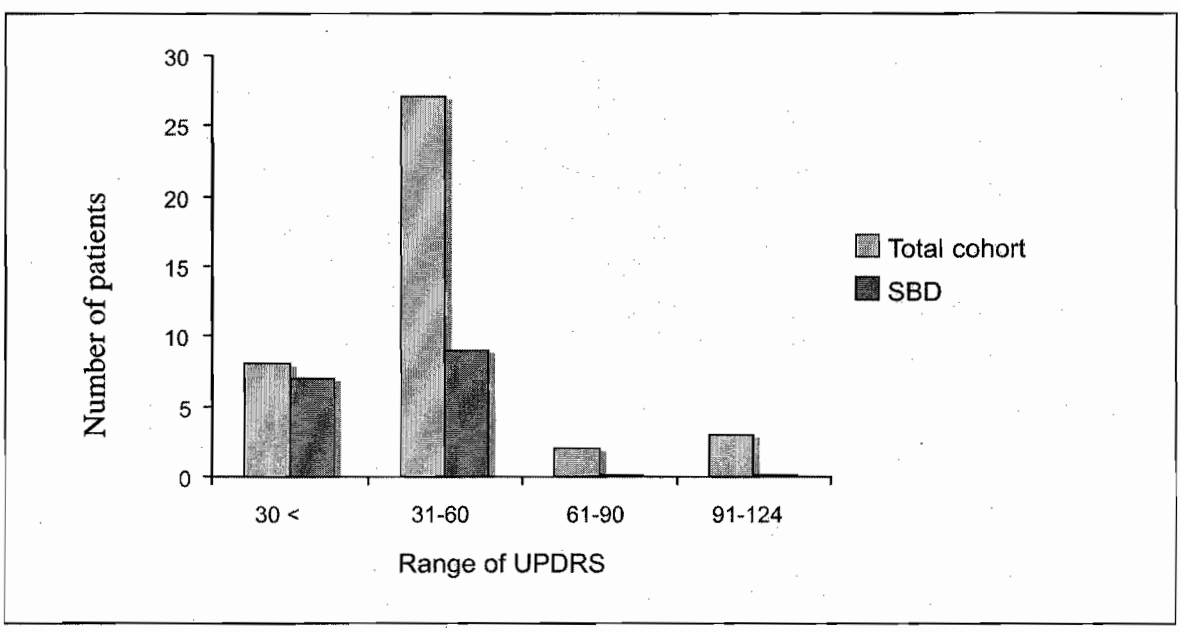


Figure 4
Modified UPDRS vs SBD



Thirty nine patients completed the BDI (23 males and 16 females). None of these patients had BDI score above ten indicating absence of depression in this cohort. Twelve patients (28.6%) were reported to have had at least one obseverd sleep behaviour disorder or described frightening dreams resulting in sleep behaviour disturbance.

Of these five (11.9%) had score of 30/108 and below on UPDRS and seven (16.6%) had score of 31-60 UPDRS and all 12 patients were in clinical stage and two in stage three disease (Figure 4). Although the numbers were small for statistical analysis there was a trend of experiencing or observed sleep behaviour disorder at an early to moderate clinical stage of the disease.

DISCUSSION

The prevalence of idiopathic Parkinson's disease, though rare in African population in comparison to developed countries, is bound to rise with advancing age in developing countries (11,12) like most diseases which are associated with ageing (13,14). Forty two patients of the new referrals to the neurology clinic were seen over a period of four years while the same hospital 18 years ago had registered only four with idiopathic PD of the 931 total admitted patients in 12 months (15).

Males were predominant in this study concurring with most studies (1). The reasons for male predominance are not clearly explained. It was possible in our series of patients males did seek treatment for symptoms of PD because it interfered with productive work. Nevertheless our study sample was hospital based therefore the explanation for excess of males remains speculative.

Head injury was not a risk factor in any of series of patients contrary to some studies (16). Smoking has been found in case-controlled studies to be associated with low incidence of PD in western world (17). It is plausible to explain the small number of smokers in our cohort to be due to cigarette smoking being rare in Africans in 1930 and 40s therefore majority of the cohort of our patients were none-smokers. Another possibility could have been due to differential survival between smokers and none-smokers may have accounted for the small number of smokers in our study but this was not addressed and requires community prospective studies.

In our series of patients the majority of males were below 60 years of age while most of the females were predominatly above the age of 61 years. This may be explained by the high prevalence of females in population beyond the age of 61 years (18).

In our series, 27 patients out of 42 had their symptoms before three years and had not been on levodopa except for two males. This implies that PD may not be easily recognised in African population by clinicians probably because it is a rare disorder in a relatively young population. Nevertheless mortality of idiopathic PD in Africa seems similar to that in developing countries (19).

Depression as defined by BDI score of more than 11 was not detected in the 39 patients who completed the BDI suggesting that depression in PD is rare in Africans with this disorder contrary to studies in developed countries (4,5).

Nevertheless our criteria for idiopathic PD was rigid loosing out patients with dementia and thought,perception disorders.The latter were excluded in our study because of limited investigations that can exclude the possible causes of these disorders.

Insomnia was common in our series similar to studies in the western world (20). Almost none of our patients in this study described daytime sleep attacks except for two males who were already on levo-dopa underscoring the findings of daytime solomensence being associated with advanced disease and treatment (21).We had a high prevalence of SBD in our series of patients which may be partly because our findings were based on reports from bed partners / reported only and recall of vivid dreams by patients without confirming with polysomnography findings and we did not use the sleep scale that is now available in some centres (22,23).

Nevertheless we found that mild disease was significantly associated with SBD than advanced disease. It has been reported that SBD may predate PD for many years (24). Therefore mild PD disease may be associated more with SBD than in advanced as was the case in our series. Further studies are needed to investigate the relationship with PD in Africans and sleep behaviour disorder.

Further studies are recommended in PD that include dementia of lewy body using psychometric tests and advanced neuroimaging. Also the burden of PD in the community in East Africa needs to be studied.

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