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Noor Ahmed Khosa

Saleem Medical Complex, Quetta

Ammanullah Kakar

Saleem Medical Complex, Quetta

Wazir Akbar

Saleem Medical Complex, Quetta

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FREQUENCY OF DEMENTIA IN PARKINSON'S DISEASE

Noor Ahmed Khosa, Ammanullah Kakar, Wazir Akbar, Muhammad Saleem Barech

Correspondence to: Dr. Noor Ahmed Khosa, Saleem Medical Complex, Quetta. Email: drnoorahmedkhosa@gmail.com

ABSTRACT

Objectives: To assess the frequency of dementia in Parkinson's disease. **Study Design:** Descriptive study
Place & Duration: The study was performed in Bolan Medical Complex Hospital, Quetta during Dec 2009 to Jun 2011 (One & half year). **Patients & Methods:** The purpose of this study was to assess the frequency of dementia in Parkinson's disease. The outdoor patients presented with features of Parkinson's disease were evaluated by using 'UKPDBB' (United Kingdom Parkinson Disease Brain Bank) diagnostic criteria, disease severity assessed by 'Hoehn and Yahr scale' and later on they will be assessed for dementia by using 'Mini-Mental Examination'. The exclusion criteria were history of repeated stroke, encephalitis, drug induced Parkinson's disease, drug addiction and brain tumour. The data was collected on structured questionnaire. For descriptive purpose patients were divided into two groups, Parkinson disease (PD) and Parkinson disease with dementia (PDD). The data was analyzed by SPSS version 17.0. The frequency distribution in number and percentage was calculated. **Results:** There were 35 patients who presented with the clinical features of Parkinson disease. The features of dementia were found in 6 patients (17 %), while 29 patients (83%) remained non-demented. Among demented patients 6 (100%) of Parkinson disease, there were five male (83.3%), while one patient (16.7%) was female. The entire demented patients had started symptoms after the 6th decade. Regarding functional disability PD group had Hoehn and Yahr score of < 3, while PDD group had > 3. Positive primitive reflexes common in both groups 4 out of 6 in PDD group, while 15 out of 29 in PD group. Mild cognitive impairment was found in 4 (11.4%) patients, not fulfilling the criteria of dementia **Conclusion:** Dementia in PD was not quite high in our study. Most of the patients had cognitive impairment during their 6th or 7th decade of life.

Key Words: Parkinson disease, Dementia.

INTRODUCTION

Parkinson's disease is one of the most frequently encountered neurological conditions clinically characterized by resting tremors, cogwheel rigidity, bradykinesia and postural instability.¹ It presents an increasing challenge to the health services.² The prevalence of Parkinson's disease is approximately 160 per 100,000 and incidence is about 20 per year. Prevalence and incidence increases with age. At age 70, the prevalence is approximately 550 per 100,000 and the incidence is 120 per 100,000 per year.^{3, 4} According to DSM-IV, the diagnosis of dementia requires the development of multiple cognitive deficits like memory, orientation, abstraction, ability to learn, visuospatial perception, language function and constructional apraxia that are sufficiently severe to cause impairment in occupational or social functions.^{5, 6} Pathological basis of dementia in Parkinson's disease is uncertain, some patients have cortical lewy body pathology; some have Alzheimer's disease and others have both.⁷ Subcortical pathologies which may contribute to dementia in

Parkinson's disease, include atrophy of cholinergic nucleus basalis of Meynert, striatonigral degeneration, and involvement of the dopaminergic ventral tegmental area and other monominergic nuclei.⁸ The incidence of dementia increases with age approaching 65% in Parkinson's disease above 80 years of age. Patients with dementia have higher mortality rate. Dementia in Parkinson's disease is not quite high in Westerns literature.⁹

Numerous epidemiologic studies have been carried out all over the world to identify the incidence and prevalence of dementia in various geographic populations as well as to establish the association of various factors with the development of dementia.^{10, 11} In Pakistan, there have been few studies focusing on dementia in Parkinson's disease. The purpose of this study was to determine the frequency of dementia in Parkinson's disease and compare this with the studies from other countries per se is considered to be less prevalent in developing countries compare to the developed. The present study would also giving a clue whether this

PATIENTS AN METHODS

This was the descriptive study with analysis of frequency of dementia in Parkinson's disease in 35 patients at Bolan Medical Complex Hospital, Quetta. The purpose of this study was to assess the frequency of dementia in Parkinson's disease and compare this with the studies form other countries. The outdoor patients presented with features of Parkinson's disease were evaluated by using 'UKPDBB' (United Kingdom Parkinson Disease Brain Bank) diagnostic criteria,¹² disease severity assessed by 'Hoehn and Yahr scale'¹³ and later on they will be assessed for dementia by using 'Mini-Mental Examination'.¹⁴ The exclusion criteria were history of repeated stroke, encephalitis, drug induced Parkinson's disease, drug addiction and brain tumour.

The interpretation of score 25-30 denoted questionably significant, 20 -25 mild degree of impairment, 10-20 moderate degree of impairment and 0-10 severe degree of impairment. The severity of cognitive impairment was described as no cognitive impairment (24-30), mild cognitive impairment (18-23) and severe cognitive impairment (0-17).

The informed consent was taken from the close relative or caregiver of the patient. The data was collected on structured questionnaire. The data was analyzed by SPSS version 17.0.

RESULTS

This descriptive hospital based study was conducted in Bolan Medical Complex Hospital, Quetta on 35 patients presented with the clinical features of Parkinson disease. The frequency of dementia was found in 6 patients (17%), while 29 patients (83%) remained non-demented. The gender distribution among demented patients 6 (100%) in Parkinson disease, there were five male (83.3%), while one patient (16.7%) was female (Figure 1). The p-value was non-significant due to small sample size.

The patients were further sub classified as Parkinson disease with dementia (PDD) and Parkinson disease (PD) only. The onset of PD as well as PDD varied widely (ranging from 40-75 years with mean age being 59 years). There were 6 patients with PDD, 5 (83.33%) male and 1 (16.67%) female.

The PDD patient had started symptom of dementia after the 6th decade. Four (64%) out of six demented patients had 61-75 years of age and two patients (36%) had age > 75 years. Males were slightly older at onset of disease. Duration of Parkinson's disease was

<10 years in all non-demented patients as compared to the >10 years in PDD group. In our study 4 (64%) patients were educated, while 2 (36%) were non-educated and demented. Regarding functional disability PD patients had Hoehn and Yahr score of <3, while PDD patients had >3 (Figure 2). Positive primitive reflexes common 4 out of 6 in PDD patients, while 15 out of 29 in PD patients. Mild cognitive impairment was found in 4 (11.4%) patients, not fulfilling the criteria of dementia (Figure 3).

Duration of illness at presentation was quite variable, ranging from 2 to 25 years. Majority of patients presented more than 5 years of their illness and found to be demented or at least mild cognitive impairment as compared to presented < 5 years of their illness, most probably due to older age reactive depression or side effect of drugs. One important observation was that predominant akinetic PD patients found to be demented contrary to tremor dominant patient. All of demented PD patients were akinetic dominant disease. Non-demented 23 patients (79.31%) had tremors, while 6 patients (20.68%) had no history of tremors. About half of the patients were noted to have postural instability at some time during their course of illness, three out of 6 patients (50%) of dementia found to be postural instability.

Thirty-two out of 35 PD patients had unilateral onset of their symptom, while in PDD group all 6 (17%) patients had unilateral onset of symptoms. Unilateral disease at onset was more common in male patients. The p-value was non-significant due to small sample size.

Figure 1: Percentage wise sex distribution among PD, PDD and MCI.

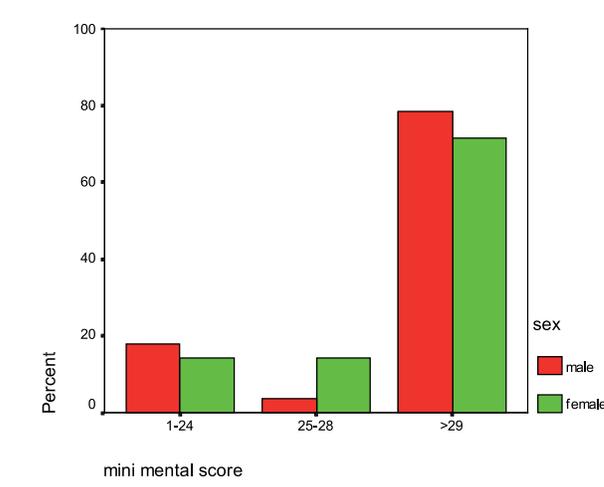


Figure 2: Relationship of Hoehn and Yahr score with PD and PDD group.

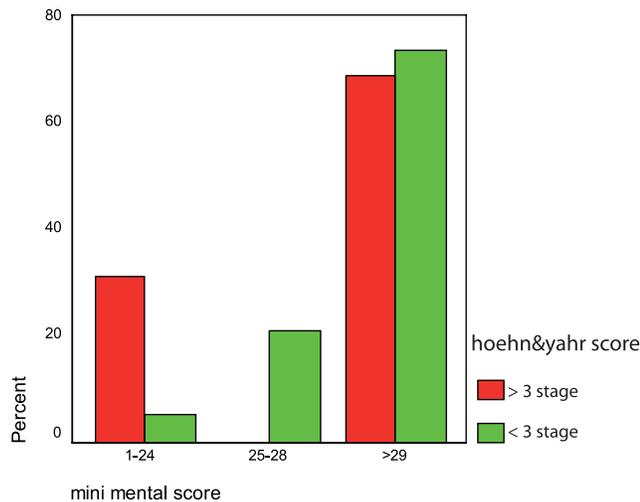
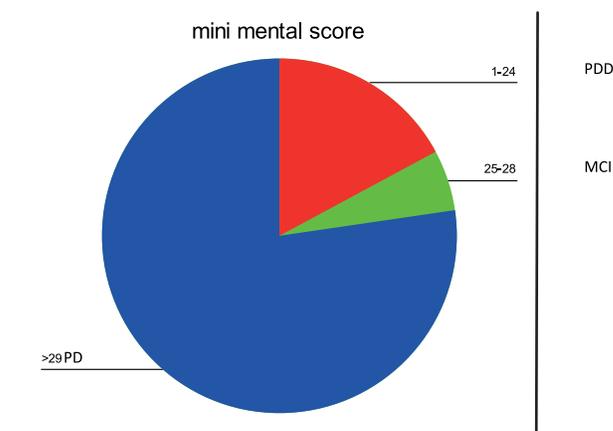


Figure 3: Distribution of Parkinson's disease, Dementia and mild cognitive impairment



DISCUSSION

Parkinson's disease is one of the most frequently encountered neurological condition clinically may be defined as the presence of two out of the three cardinal features of bradykinesia, rigidity and tremor. A good clinical response to Levodopa. No "atypical" features suggestive of another Parkinsonism syndrome.² Dementia is a syndrome of impaired cognition caused by brain dysfunction. It is characterized by multiple cognitive deficits that include memory impairment and at least one of the following: aphasia, apraxia, agnosia or a disturbance in executive functioning.⁸ In our study there were 35 patients of Parkinson's disease with their mean age of 60 years. Males were at increased risk of dementia as compared to the female in our study. Some Western studies also had same gender distribution while some of them contrary from our study. Most of the patients had onset of the cognitive symptoms during 6th decade of their lives. Similar results have been described in Western literature.¹⁵ The magnitude of difference mentioned in prior Pakistani literature was more significant i.e. male: female was 4-7:1.¹⁶ The world literature suggests that the disease is most common in rural dwellers and urban dwellers, which have either rural background or live around industries.¹⁷ A Pakistani study reports rural to urban ratio 3: 2.¹⁸ We found that 90% of our patients were urban citizen. Majority of our patients belonged to middle class. We have no exact data about the patients who presented only to the outpatient clinic. However, in our study more than 70% of patients with PD visit neurology clinics without ever being admitted to hospital and majority of

these have stage I-III of H & Y scale. As compared to the Western literature dementia was estimated to occur in about 15 %-20% percent of patients. In an epidemiologic study of 339 consecutive patients, the overall prevalence was 10.9%. This is likely an underestimate due to the shorter life expectancy of PD patients with dementia as shown by survival analysis.¹⁹ Dementia is not an early feature of PD but eventually develops in 20-30 years of patients, making it the third most common cause of dementia in the elderly.²⁰

The risk of dementia in PD was found to be almost twice and even almost sixfold that of age-matched non-demented elderly controls. Dag Aarsland et al²¹ in a community based prevalence study found that 27% of patient with PD had dementia. The development of dementia is associated with longer disease duration of disease and survival time is shorter in patients who have PD with dementia compared with those without dementia. In our study we have found dementias in 6 patients out of 35. There were 5 male and one female patient. Only 4 patients had mild cognitive impairment in spite of dementia because they were not fulfilling the MMSE criteria for dementia. Cognitive impairment was also more common in our patients (25%) with disease duration of < 10 years and 75% patients when duration was > 10 years.

Patients with akinetic dominant PD and hallucination prior to the baseline evaluation were at higher risk of developing dementia than those with tremor dominant Parkinsonism and without hallucinations. (Aarsland D, 2003) In our study 90% of akinetic dominant PD were

having dementia as compared to the tremor dominant Parkinsonism. Tremor at onset may be a marker for more widespread basic pathology that contributes to an increased risk of cognitive impairment. Some studies showed patient with tremor at disease onset are more likely to suffer cognitive impairment in the more advanced stages of the disease than patients with akinesia or rigidity at onset.²²

Recently, Grossman et al²³ examined the impact of lateralization of tremor at disease onset on cognition, they found that patients with left sided onset of tremor showed a significant decline cognitive performance over a 2-5 years period (95%), whereas patients with right sided onset remained cognitively intact. The studies that focused on "predominance" of symptom type in the early to middle stages of the disease reported greater risk of cognitive impairment in akinetic than in tremor subgroups. In our study we found majority of patient with akinetic dominant relation with dementia. Symptoms of depression illness were present in 40% of total patients but it is very difficult to assess the frequency of depression. Review of literature showed high incidence of depression.²⁴ The depression may contribute to cognitive impairment and thus lead to an over estimate of dementia in the PD group.²⁵ Consensus on familial basis for the disease concluded that many investigators believe that 15-20% of patients have familial disease. Recently 3 gene Loci have been identified. The mutation of these genetic Loci may lead to PD including autosomal recessive Juvenile Parkinsonism (AR-JP) (140).²⁶ In our study only one patient had a positive family history but genetic mapping was not performed due to non-availability of technique.

CONCLUSION

Dementia in PD was not quite high in our study as compared to the western literatures. Most of the patients had cognitive impairment during their 6th or 7th decade of life. The male were more affected. The relationship of Hoen&Yahr score is directly proportional to the PDD group. Akinetic predominant PD patients had more relation with cognitive impairment as compared to tremor dominant Parkinson's disease.

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