Parkinsonism and Depression (an Egyptian Study)

By: A. Okasha, Amira Ahmed Zaki and A.H. Khalil

ABSTRACT

Twenty right-handed patients with idiopathic PD were examined to determine the prevalence of depression. None of the patients had received treatment and those with high ischaemia scores were excluded. All subjects completed the Beck depression scale, Hamilton depression scale and the depression scale from Guilford Battery. 50% of our patients suffered from depressive symptomatology compared to 10% only of the control group. Using Hamilton Scale, it was found that 35% of the patients had only mild depression and 15% had moderate to severe depression. The studied group of patients exhibited an emotional predisposition to depressive illness as manifested by their significant higher scores in Depression Scale of Guilford Battery. No significant cognitive impairment using the Wechsler Scale could be found in our patients, which was attributed to the selection of younger patients and the exclusion of atherosclerotic ones. Our results indicate a significant relationship between PD and depression and a treatment program which combines L-dopa and antidepressants is recommended.

INTRODUCTION

Mild to severe emotional symptoms are not unusual in patients with Parkinson's disease (PD) *(Warbutton, 1967, Mindham, 1970).* Without doubt the most frequent psychological disorder in PD is depression *(Robins, 1976).* The prevalence of depression in PD was estimated in previous reports and found to range between 30-90% *(Brown and Wilson, 1972, Celesia and Wanamarker, 1972 and Mindham et al., 1976).* Depression can occur several years before the first appearance of parkinsonian symptoms *(Mayeux et al., 1981).* It

has been suggested that no relationship exists between the degree of depression in PD and either the duration of the disease or the severity of the physical disability *(Marsh and Markham, 1973, and Mayeux et al., 1981)*. Cognitive change is part of the symptomatology of primary depressive illness, therefore *Marsh and Markham (1973)*, stated that to study the incidence of depression in PD, both patients and controls must be matched for mental state. A major question that is still under much investigation is whether there is a specific reduction in mental function in PD, or simply whether senile dementia occurs in older patients *(Marttilla and Rinne, 1976; Lieberman et al., 1979; and Rossor, 1981)*. Depression and dementia may be two limbs of a brain dysfunction; one should be very cautious of diagnosing dementia in PD before giving a proper trial of anti-depressants *(Folstein and McHugh, 1978)*. Both syndromes, PD and depression, involve biogenic amine metabolism *(Direnfeld et al., 1984)*. The variety of interpretations and the need for further explanations to define in greater detail the subject prompted us to carry out a study to establish the incidence and degree of depression in Egyptian patients with idiopathic PD. Also to estimate the prevalence of cognitive impairment and its relationship to the severity of depression in this group of patients (where present).

SUBJECTS AND METHODS

Twenty patients with idiopathic PD were selected from the Neuropsychiatry Department in Ain Shams University Hospital. They were 9 men and 11 women with a mean age of 53 years; only 35% of them received adequate education, and 65% were illiterate. The mean duration of the disease was 3.6 years. All the patients were predominantly right-handed, with no previous history of psychiatric disorders or receiving psychotropic drug medication. They received no anti-parkinsonian medications and if present they were discontinued 48 hours prior to neuro-psychological examination. Those with atherosclerotic and iatrogenic PD were excluded.

The control group consisted of twenty subjects apparently free from clinical signs of focal neurological lesion, psychiatric disorders or mental deterioration. They were matched with the parkinsonians for age, sex, education and sociocultural status.

PROCEDURES

Neurological Assessment

Each subject was interviewed and examined by the same Neurologist. A standard examination was applied including a detailed history especially for the duration of illness and history of previous medications, and a proper examination especially for the three cardinal features of PD (tremor, rigidity, and bradykinesia).

Psychiatric Assessment

A semistructured psychiatric interview was used by a psychiatrist. The diagnosis was carried out according to the DSM III criteria *(DSM III 1980)*. Each subject underwent assessment of depressive symptomatology using the arabic version of Beck Depression Scale *(Beck, 1961 and Beck, 1975)*. The reliability of this assessment has been established *(Beck, 1970)*. The severity of depressive symptoms was determined by using the Hamilton Depression Scale *(Hamilton, 1960 and Hamilton, 1967)*.

Psychological Assessment

The following tests were administered

a. The "Depression Scale" from Guilford Battery. The (D) is a factor analytically based Inventory which reflects a total profile for Depression trait. The standard norms is 27.8 ± 10.6 *(Anastasi, 1978)*.
b. The Wechsler Belliwer Scale. We used the standardized arabic version *(Melika, 1983)*. This scale provides information about the most important aspects of the subjects intellectual functioning.

RESULTS

The mean score using Depression scale from Guilford Battery is significantly higher than the mean score of the control group (Table 1).

Table 1: Scores of depression using depression scale from Guilford Battery

Scores	Cases	Controls
Mean	45.42	37.0
S.D. ±	6.70	7.4
t test	P < 0.01	

The severity of depression in the patients was estimated using the Hamilton Scale for depression. 40% of our patients did report mild depression while only 25% reported moderate to severe depression (Table 2). Parkinsonian patients scored significantly higher on the Beck Scale (Table 3). An item-by-item analysis of the Beck in these patients with PD shows that sadness, indecisiveness, sense of failure bouts of crying and loss of weight, account for the bulk of the difference in total scores (Table 4).

Table 2: Assessment of severity of depression by Hamilton depression scale

Depression	Cases		Controls	
	No.	%	No.	%
Absent	10	50	18	90
Mild	7	35	2	10
Moderate	2	10	0	0
Severe	1	51	0	0
Total	20	100	20	100

The test scores for the two groups were analysed by (X^2) test
$P < 0.05$

Table 3: Mean scores on Beck Scale

Scores	Cases	Controls
Mean	43.0	36.1
S.D. ±	21.3	17.04
t test	P < 0.05	

Table 4: An item-by-item analysis of the Beck in patients with PD and the control group

Beck item	Case No.	Controls No.	(Z) test	P values
Sadness	8	2	2.20	< 0.05
Unsatisfaction	3	3	0.00	> 0.05
Guilt	3	1	1.06	> 0.05
Indecisiveness	5	1	1.78	< 0.05
Sleep disturbances	6	6	0.00	> 0.05
Fatiguability	11	8	1.00	> 0.05
Worry about health	8	5	1.00	> 0.05
Loss of interest in sex	5	3	0.80	> 0.05
Loss of interest in work	10	7	1.00	> 0.05
Sense of failure	5	1	1.78	< 0.05
Bouts of crying	4	2	1.78	< 0.05
Loss of weight	3	3	1.78	< 0.05
Loss of appetite	4	6	1.06	> 0.05
Pessimism	2	0	0.00	> 0.05
Anger	3	2	0.80	> 0.05
Self-harm	1	0	0.00	> 0.05
Social withdrawal	2	0	0.00	> 0.05
Body image	2	1	0.80	> 0.05

Table 5: Psychiatric morbidity

	No	%
Major affective disorder	2	10
Atypical depression	1	5
Adjustment disorder	2	10
Organic personality disorder	1	5
Paranoid disorder	2	10
Somatoform disorder	2	10
No psychiatric disorder	11	55

10% of parkinsonian patients could be diagnosed according to the DSM III classification as Major Affective Disorder. They showed dysphoric mood and loss of interest in all usual activities. They were depressed, sad, hopeless, and had poor appetite. They were unable to face day to day affairs due to their psychomotor retardation. They suffered also from diminished ability to think and concentrate. None of the patients had melancholic nor psychotic features. Only one patient with PD could be labelled the diagnosis of Atypical Depression, while 10% had Adjustment Disorder with depressed mood. The first patient was retired since 2 months and the second patient had been divorced due to her failure to carry out her domestic responsibilities and duties. In both patients the psychosocial stressors could be considered as moderate.

5% could be diagnosed as organic personality disorder which was characterized by emotional lability, lack of impulse control, poor social judgment and apathy. One of the patients manifested by persistent delusion of jealousy and infidelity, suspiciousness and fear of being poisoned.

Two patients were diagnosed as Sinatifirn Disorder, they were predominantly manifested by hypochondriasis with unrealistic interpretation of their physical signs. They had a history of "doctor shopping" and they frequently believed that they are not getting proper care.

Tables (6, 7) demonstrates the scores obtained by the patients and controls in Wechsler Belliwer Scale.

Table 6: Wechsler scale

	Cases Mean±S.D.	Controls Mean±S.D.	P values
Verbal IQ	86.3±13.1	88.9±13.0	> 0.05
Performance IQ	88.8±16.8	92.1±15.8	> 0.05
Full scale IQ	89.2±13.7	88.3±13.3	> 0.05

Verbal/performance IQ of the cases P > 0.05
Verbal/performance IQ of the controls P > 0.05

Table 7: Individual results of Wechsler subtests

	Cases Mean±S.D.	Controls Mean±S.D.	P values
Comprehension	9.6±13.4	9.8±3.5	> 0.05
Digit span	6.2±1.8	7.6±2.3	> 0.05
Arithmetic	6.5±3.3	7.6±2.7	> 0.05
Similarities	8.2±3.2	7.6±1.5	> 0.05
Vocabulary	7.9±3.0	7.8±2.1	> 0.05
Block design	6.6±2.3	6.5±1.8	> 0.05
Picture completion	7.5±2.9	8.4±2.5	> 0.05
Digit symbol	5.4±1.5	6.7±2.2	> 0.05
Picture arrangement	6.5±2.8	6.8±1.6	> 0.05

DISCUSSION

Since James Parkinson recognized depression in his patients *(Parkinson, 1938)* subsequent investigators observed depression in

30% to 90% of patients with PD *(Brown and Wilson, 1972, Houn and Mindham et al., 1976)*. This discrepancy reflects a great deal of disagreement in different reports regarding the incidence of affective symptoms in PD depending on doubt upon the particular population under scrutiny *(Brown and Wilson, 1972)*. However it is generally held that depression is more common in patients with PD than the general population *(Mayeux et al., 1981)*.

In this study we found that 50% of our patients suffered from depressive symptomatology compared to 10% only of the controls (Table II). *Asnis (1977)* mentioned that, although the severity of depression varies in previous reports, yet it is usually considered mild. In this work (Table II) demonstrates that 35% of our patients had only mild symptoms and 15% reported moderate to severe depression using Hamilton Scale. *March and Markham (1973)* stated that those patients with PD who showed moderately to severely elevated depressive scores suggest a prevasive maladjustment with a preoccupation with physical functioning and feelings of hopelessness.

Depression has not been consistently related to any specific aspect of PD, but it may be associated with other characteristics of the patients *(Goodwin, 1971)*. It has occasionally been suggested that parkinsonian patients have characteristic traits which make them vulnerable to develop the disease *(Sands, 1942, and Booth, 1948)*. Our patients exhibited an emotional predisposition to depressive illness as manifested by their significant higher scores in depression scale of Guilford battery (Table I). Other studies clarified the presence of emotional inflexibility, suppressed aggressivity and obsessional personality traits displayed by a number of parkinsonian patients *(Pollock and Hornabrook, 1966, Fonda, 1985 and Todes, 1985)*. We are in agreement with *Marsh and Markham (1973)*, that the greater number of females in the studies group and the control group may have biased these groups toward elevated scores on emotional symptoms.

Depression in PD has often been considered a realistic reaction to a progressive crippling disease *(Midham, 1970)*, but the finding that parkinsonian patients remain moderately depressed inspite of significant improvement in their motor functioning after levodopa treatment suggests that the depression is probably not a reactive one related to impaired physical functioning *(Marsh and Markham, 1973)*.

Our results indicate that no relationship exists between the degree of depression in PD and either the duration of the disease or the severity of the physical disability. We had two patients after 12 and 20 years of the PD who exhibited no depressive symptoms. This conclusion is like that achieved by *Marsh and Markham (1973) and Mayeux et al. (1981).*

The relationship between PD and depression is not surprising as in both conditions there are disturbances of catecholamines and indolamine metabolism *(Riederer et al., 1978 and Birkmayer and Riederer, 1982).* In the brain stem of PD patients there appear to be disorders of the balance between neurotransmitters and the dynamic equilibrium between biogenic amines; these biochemical abnormalities are present also in the limbic system, locus ceruleus, hypothalamus, mid brain as well as in the striatum and substantia nigra, the latter act as a "distribution center" which acts as a moderator of motor, autonomic and emotional function *(Appenzeller and Goss, 1971, Lipman et al., 1974; Malarkey et al., 1974, Brown et al., 1978 and Riederer et al., 1983).*

A program which combines L. dopa and antidepressants is often required for patients with depression and PD *(Mindham, 1970, and Lishman, 1978).* Those last two authors mentioned that improvement in mood by suitable anti-depressant treatment may be the most profitable way of helping such patients. The question arises; which drugs can influence such varied systems, tri and tetracyclic antidepressants or Mono-Amine-Oxidase inhibitors type A and B.

Lieberman et al. (1979) found depression in both their demented and non demented patients. In this study we found that parkinsonian patients scored non significantly worse than the controls in the performance of the tests of Wechsler Scale (Table VI, VII). Moreover they had non significantly more frequently memory, concentration and attention problems which manifest themselves mainly in the following Wechsler subtests: Digit span and Arithmetic subtests of the verbal scale. The former subtest measures focused attention and immediate memory span plus the ability to store a few data bits briefly and at the same time juggle them around mentally. The latter subtest measures the concentration abilities *(Melika, 1983).* But we should take into consideration that most of our patients had mood disorder which may be accompanied by impairment of cognitive

skills as mentioned by *Robertson and Taylor (1985) and Watts and Sharrock (1985).* The subtle cognitive deficits noticed in this work correlated with depression but a causal relationship could not be established because several other factors (such as age, education and severity of PD) contributed independently. *Mayeux et al. (1981)* stated that depression in PD may be accompanied by mild intellectual impairment and inattention and suggested that dementia seems to affect older patients and occurs late in the course of the disease. In this study we observed that, patients with PD and depression were younger and had a typically slow progression of the disease, which may explain why significant cognitive deficits did not accompany depression in those patients. *Benson (1975)* mentioned the same results. *Direnfeld et al. (1984), Caltagirone et al. (1985), Perry et al. (1985), Sanes (1985) and Scholtz and Sastry (1985)* reported significant cognitive impairment in PD. The difference between our results and the results of the later authors may be explained by the following: the mean age of our series is much younger (53 years), the mean duration of illness is shorter (3.6 years), the exclusion of those having atherosclerotic parkinsonism. Cognitive and intellectual impairment in PD have previously been attributed to reduction of the mean brain hemispheric and regional blood flow *(Globus et al., 1985)* and appear to be associated mainly with arteriosclerotic parkinsonism *(Lishman, 1978).*

Finally we can say that the relationship between PD, depression and cognitive function is complex and still represents a fruitful area for different future researches.

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AUTHORS

1. A. Okasha, F.R.C.P.; F.R.C.P.E., Professor and Head of Psychiatric Department, Ain Shams University.

2. Amira A. Zaky, M.D.; Assistant Professor of Neurology, Ain Shams University.

3. A.H. Khalil, M.D.; Assistant Professor of Psychiatry, Ain Shams University.

LA MALADIE DE PARKINSON ET LA DEPRESSION (UNE ETUDE EGYPTIENNE)

ABSTRAIT

Nous avons éxaminé 20 patients atteints de la maladie de Parkinson et ceci pour déterminer la fréquence de la dépression parmi eux. Ce groupe de patient n'était pas sous traitment. Nous avons évalué tous les patients à l'aide de l'échelle de dépression de Beck, d'Hamilton, et de Guilford. Nous avons trouvé que 50% de nos patients souffraient de symptômes dépressifs, et ceci en comparaison avec 10% seulement du groupe controle. Suivant l'échelle d'Hamilton, nous avons trouvé que 35% des patients avaient une dépression légère, et 15% une dépression moyenne à sévère. Le groupe de patients étudié a montré une préposition émotionelle à la maladie dépressive, et ceci était évident à la suite de leur résultat dans l'échelle de dépression de Guilford.

Nous n'avons pas trouvé un affaiblissement intellectuel significatif, suivant l'échelle de Wechsler, chez nos patients. Nos resultats indiquent la présence d'une relation significative entre la maladie de Parkinson et la dépression, et le programme thérapeutique devrait donc combiner les antidépresseurs avec L-dopa.

الموجـــــز

الاكتئاب النفسى وعلاقته بمرض الشلل الاهتزازى الذاتى عند المصريين

تم اختيار عشرين مريضاً يعانون من مرض الشلل الإهتزازى الذاتى بعد إستبعاد الحالات التى تتعاطى أى نوع من العقارات وكذلك التى تظهر عليها العلامات الإكلينيكيه لتصلب شرايين الدماغ. وقد دلت نتيجة البحث على ان خمسين بالمائة من المرضى كانوا يعانون من الاكتئاب النفسى (٣٥٪ إكتئاب نفسى بسيط و١٥٪ إكتئاب نفسى حاد) فى مقابل ١٠٪ فقط من العينة الضابطة. ولوحظ ان هؤلاء المرضى يتميزون بسمات وجدانية تساعد على حدوث الإكتئاب النفسى.

ولم يلاحظ وجود أى اضطرابات معرفية سواء عند المرضي أو فى العينة الضابطة ويمكن أن يعزى ذلك الى إختيار المرضى من بين صغار السن وإستبعاد الحالات التى تعانى من تصلب فى شرايين الدماغ من البحث. وقد اتضح من البحث وجود علاقة قوية بين هذا المرض والاكتئاب النفسى.