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Movement Disorder in Never and Minimally Treated Nigerian Schizophrenic Patients

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Two hundred and forty-two Nigerian schizophrenic patients (63% male, 37% female), whose mean age was 42 years and length of illness 12 years, were examined for movement disorders using the Abnormal Involuntary Movements Scale, the Simpson and Angus Parkinsonism Scale and the Barnes Akathisia Scale. Twelve patients had never received antipsychotic medication; and none of these had dyskinesia. Dyskinesia was found in 5 of 49 patients (10%) who had taken medication throughout the course of their illness for a total of up to 3 months, 13 of 74 (18%) who had taken medication for 4–12 months, 14 of 41 (34%) for 1–5 years, and 29 of 66 (45%) who had taken medication for more than 5 years. Of 77 patients who were receiving antipsychotic medication at the time of examination, 9 (12%) had Parkinsonism and 12 (15%) akathisia. Examination of the patients' mental state by the Positive and Negative Syndrome Scale showed an association between dyskinesia and positive, but not negative, schizophrenic symptoms. Nigerian patients showed a low level of negative symptoms.

Over 30 years before the introduction of antipsychotic drugs, Kraepelin (1919) wrote:

> "The *spasmodic phenomena* in the musculature of the face and of speech which often appear are extremely peculiar disorders. Some of them resemble movements of expression, wrinkling of the forehead, distortion of the corners of the mouth, irregular movements of the tongue and lips, twisting of the eyes, opening them wide and shutting them tight, in short those movements which we bring together under the name of making faces or grimacing; they remind one of the corresponding disorders of choreic patients. . . . The outspread fingers often show fine tremor. Several patients continually carried out peculiar sprawling irregular, choreiform, outspreading movements which I think I can best characterise by the expression 'athetoid ataxia'."

Kraepelin did not quantify what he meant by "often appear", and said nothing about how long the patients had been ill. A similar description nowadays would be taken for 'tardive' dyskinesia, believed to be associated with the administration of antipsychotic drugs (American Psychiatric Association Task Force, 1980).

In support of Kraepelin's description of dyskinesia occurring in the absence of medication, Owens & Johnstone (1980) found movement disorders in 27 of 52 never-medicated British patients; their mean age was 68 years. In a more detailed study of 47 of these patients (Owens & Johnstone, 1982), where the assessors were not blind to medication status, there were few significant differences in prevalence and severity of abnormal movements in this group when compared with those with a history of treatment with neuroleptics. In contrast, no movement disorders were found in 50 never-treated schizophrenic patients in Morocco whose mean age was 24 years and length of illness 11.8 months (Chorfi & Moussaoui, 1985). However, again, the assessors were not blind to medication status. A similar finding was reported in 28 newly psychotic never or minimally treated American patients (Kane *et al*, 1983).

In the present study we report the prevalence of movement disorders in chronically ill Nigerian schizophrenic patients of early middle age, who were assessed blind to medication status. We describe also the relationship between movement disorders and abnormalities of mental state.

Method

Although psychiatric services in Nigeria are slowly developing, resources are still scarce. In a country of about 90 million people there are approximately 50 trained psychiatrists, most of whom work in the southern states (Odejide & Ohaeri, 1990). A psychiatric hospital such as Yaba, with 500 beds, is the only one that serves Lagos, a city of 7–9 million people. Furthermore, there are no insurance schemes, either national or private. All care, including medicines, must be paid for; the cost of a week's supply of an antipsychotic drug such as chlorpromazine, 600 mg daily, is equivalent to two weeks' wages for a 'junior' worker. It is clear, therefore, that some schizophrenic patients may never receive treatment or will have been undertreated.

Identification of patients

Patients were examined in four places. Dawanau Rehabilitation Centre in Kano, Northern Nigeria, has

approximately 400 residents. Admissions are from two principal sources. Some patients are brought to the centre by relatives, visited once and then usually abandoned. Others are so-called 'raided' patients; from time to time the authorities 'raid' the streets and remove to the centre those homeless vagrants who appear to be suffering from mental illness. The principal source of medication at Dawanau was from relatives who buy what is prescribed by the psychiatrist. All patients had case records that gave details of medication prescribed. Wudil Rehabilitation Centre, Northern Nigeria, has about 40 male patients. It is deep in the countryside and contains mainly 'raided' patients. The only source of medication is an intermittent supply by charitable organisations. There were no case records. Majidun Rehabilitation Centre, outside Lagos in Southern Nigeria, has 400 residents. Most patients are 'raided'. Medication is supplied mainly by charitable organisations. Yaba Psychiatric Hospital, Lagos, has 500 in-patients and has regular out-patient clinics. Medication is readily available and is paid for by relatives. All patients in Majidun and Yaba had case records with details of medication prescribed.

Assessment

The patients' current mental states were assessed using the Positive and Negative Syndrome Scale (PANSS; Kay *et al*, 1987) by one of us (JUO), a Nigerian psychiatrist who is fluent in Yoruba and English. Patients in the south were interviewed in English or Yoruba. Patients in the north, largely Hausa speaking, also were interviewed by the same psychiatrist through an interpreter using a semi-structured interview in Hausa. The original interview in English was translated into Hausa, back-translated into English, and final modifications made (copies available on request). On the basis of symptoms elicited at the interview, history from the patient, and examination of case records, a DSM–III–R diagnosis (American Psychiatric Association, 1987) was made. Only patients with a diagnosis of schizophrenia were included in the study.

Movement disorders were assessed by the second psychiatrist (RGM). Most Nigerians in the south had at least limited or 'pidgin' English, and examination proved easy with limited help from an interpreter. Hausa-speaking Nigerians in the north were examined with the help of an interpreter. Dyskinesia was assessed by the Abnormal Involuntary Movements Scale (AIMS; US Department of Health, Education and Welfare, 1976), Parkinsonism by the Simpson and Angus Scale (Simpson & Angus, 1970), and akathisia by the Barnes Scale (Barnes, 1989).

Practice sessions where both psychiatrists together, but independently, assessed English-speaking patients' mental state and abnormal movements took place before the study proper began, to ensure that they were agreed as to what constituted abnormal symptoms and signs. During the study proper, both psychiatrists at the time of assessment were blind to the other's assessment. The assessor of movement disorders was blind to the medication status of the patients.

The following social, demographic, and clinical data were also recorded: age, gender, age of onset of illness, and year of first contact with the psychiatric facility. The parents of a few patients had never told them their date of birth; in these cases an estimate of their age was made through reference to important Nigerian events (for example, patients' school grade at the time of outbreak of the Nigerian civil war). Age of onset of illness was defined as the time of first appearance of positive psychotic symptoms, using information obtained from patients, from their case records, and from relatives (recorded in the case notes). Where patients gave an inadequate history and no information from relatives was recorded in the case notes, the age of onset of illness was taken to be the age at first contact with the psychiatric services. Medication histories were obtained from case records, with the exception of Wudil (see above); the psychiatric nurse in Wudil explained that a charity donated chlorpromazine so that each resident would receive 200 mg nightly for two to three weeks each year. The total length of time that a patient had been exposed to antipsychotic medication throughout the course of the illness was measured; the maximum daily dose was also recorded and converted to milligrams of chlorpromazine equivalents (Davis, 1985).

Results

Two hundred and forty-two patients were examined in October–November 1992. There were 152 males (63%) and 90 (37%) females. Their mean age was 42 years (s.d. 13 years), mean age of onset of illness 31 years (s.d. 10 years), and mean length of illness 12 years (s.d. 8 years). The gender distribution, age, age of onset, and length of illness for the patients in the four different centres are shown in Table 1.

In Dawanau Rehabilitation Centre ($n=67$) no patients were receiving antipsychotic medication at the time of examination. Ten patients (15%) had dyskinesia as defined by Schooler and Kane Criteria (Schooler & Kane, 1982); that is, movements were rated 'moderate' in at least one or 'mild' in at least two of the seven individual areas assessed by the AIMS. No patient had Parkinsonism, defined by Simpson & Angus (1970) as a score of more than 0.3 on their scale. None had akathisia, defined as a score of at least two on the Barnes Global Scale.

In Wudil Rehabilitation Centre ($n=23$, all males) none were receiving antipsychotic medication at the time of examination. Four patients (17%) had dyskinesia, one (4%) had Parkinsonism, and none had akathisia.

In Majidun Rehabilitation Centre ($n=84$), the patients examined had either never had antipsychotic medication until the calendar year of the study, or had had access to medication at least two years before the study began. Nineteen (23%) had dyskinesia, six (7%) had Parkinsonism, and two (2%) had akathisia.

In Yaba Psychiatric Hospital ($n=68$) all patients examined had been ill for at least five years and had access to antipsychotic medication. There were three groups: those attending on one day at an out-patient clinic ($n=22$); those in an admission/medium-stay ward ($n=31$); and those in a long-stay annexe ($n=15$, all males). Twenty-eight (41%) had dyskinesia, seven (10%) had Parkinsonism, and two (15%) had akathisia.

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Table 1
Age, age at onset, and length of illness in Nigerian schizophrenic patients

Rehabilitation centre or hospital	Age: years						Age at onset: years						Length of illness: years					
	Male			Female			Male			Female			Male			Female		
	mean	s.d.	range	mean	s.d.	range	mean	s.d.	range	mean	s.d.	range	mean	s.d.	range	mean	s.d.	range
Dawanau	35	10	20-60	40	12	25-65	27	10	13-55	34	13	18-63	8	4	1-17	7	4	2-16
Wudil	41	11	29-65	-	-	-	32	10	20-55	-	-	-	9	2	5-16	-	-	-
Majidun	42	12	16-65	43	13	22-66	31	9	33-48	35	11	15-63	11	6	1-23	9	5	1-21
Yaba																		
out-patients	36	8	30-51	46	12	31-63	23	6	14-31	30	11	18-52	13	6	6-20	16	8	7-28
in-patients	50	19	24-75	55	13	29-78	29	11	15-53	32	9	18-54	21	13	7-40	23	9	5-40
annexe patients	48	10	28-65	-	-	-	31	9	19-45	-	-	-	17	9	6-30	-	-	-

Patients who had dyskinesia ($n=61$) when compared with those without dyskinesia ($n=181$) were older ($t=5.59$, $P<0.0001$), had been ill longer ($t=6.54$, $P<0.0001$), and had been receiving medication longer ($t=4.64$, $P<0.0001$) and at a higher maximum daily dose ($t=3.41$, $P=0.0008$) (Table 2).

The relationship between medication and dyskinesia was examined further in the following way. Patients were divided into five groups: those who had never received antipsychotic medication ($n=12$); those who had received medication for a total of up to 3 months throughout the course of their illness ($n=49$); for 4–12 months ($n=74$); for 1–5 years ($n=41$); and for more than 5 years ($n=66$). Table 3 shows the prevalence of dyskinesia and also the mean age, age of onset of illness, and length of illness in the five different groups in the four centres. Dyskinesia was found in no patients who had never been exposed to antipsychotic medication, in 5 (10%) of those who had taken medication for up to 3 months, in 13 (18%) of those who had received medication for 4–12 months, in 14 (34%) for 1–5 years, and in 29 (45%) for more than 5 years ($\chi^2=26.20$, d.f. $=4$, $P<0.0001$). When the five groups were compared for mean age and length of illness it was found that there were significant between-group differences for both variables (analysis of variance, $F=6.82$ and 33.10, respectively; $P<0.0001$). Subsequent t-tests using Bonferroni's correction showed that the only group that differed from the others was the one where patients had taken medication for more than 5 years; patients in this group were older ($P<0.0001$) and had been ill longer (<0.0001). When the first four groups were examined separately, the difference in prevalence of dyskinesia remained statistically significant ($\chi^2=11.87$, d.f. $=3$, $P=0.008$).

When patients with and without dyskinesia were compared within each of the first four groups on the basis of age and length of illness, there was a trend for patients with dyskinesia to be older. However, the only statistically significant difference was in the 4–12-month exposure group (Table 4, $t=2.10$, $P=0.03$). When the fifth group (those who had received medication for more than 5 years) was examined it was found that those who had dyskinesia ($n=29$) were significantly older (Table 4, $t=5.00$, $P<0.0001$), had been ill longer (Table 4, $t=4.82$, $P<0.0001$), and had been on medication longer (mean 135 months v. 109 months, $t=2.10$, $P=0.04$) than those who had no dyskinesia ($n=37$). The two groups did not differ in age of onset of illness or mean maximum daily dose of antipsychotic medication.

Seventy-seven patients were receiving antipsychotic medication at the time of examination, and had done so on a regular basis for nine months prior to examination. The mean daily dose (mg chlorpromazine equivalents) at the time of assessment was 477 (s.d. 479). Nine of these patients (12%) had Parkinsonism and 12 (15%) had akathisia.

Table 2
Patients with and without dyskinesia

	Patients with dyskinesia ($n=61$)	Patients without dyskinesia ($n=181$)
Gender		
male	38 (62%)	114 (63%)
female	23 (38%)	67 (37%)
Mean (s.d.) age: years	50 (14)	40 (11)
Mean (s.d.) age at onset: years	33 (11)	30 (10)
Mean (s.d.) length of illness: years	17 (10)	10 (6)
Mean (s.d.) length of time on antipsychotic medication: months	68 (64)	30 (51)
Mean (s.d.) maximum daily dose of medication: mg chlorpromazine equivalents	684 (531)	468 (380)
Mean (s.d.) PANSS score		
positive symptoms	15 (7)	12 (5)
negative symptoms	12 (8)	12 (8)
general psychopathology symptoms	24 (7)	23 (6)

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Table 3
Dyskinesia and length of time on medication

Rehabilitation centre or hospital	Length of time on medication									
	0		up to 3 months		4-12 months		1-5 years		>5 years	
	n	No. with dyskinesia(%)	*n*	No. with dyskinesia (%)	*n*	No. with dyskinesia (%)	*n*	No. with dyskinesia (%)	*n*	No. with dyskinesia (%)
Dawanau	8	0 (0)	17	1 (6)	21	3 (14)	21	6 (29)	-	-
Wudil	-	-	22	3 (14)	1	1 (100)	-	-	-	-
Majidun	3	0 (0)	9	1 (11)	51	9 (18)	17	7 (41)	4	2 (50)
Yaba										
out-patients	-	-	-	-	-	-	2	1 (50)	20	7 (35)
in-patients	1	0 (0)	-	-	-	-	-	-	30	14 (47)
annexe patients	-	-	1	0 (0)	1	0 (0)	1	0 (0)	12	6 (50)
Total	12	0 (0)	49	5 (10)	74	13 (18)	41	14 (34)	66	29 (45)
Mean (s.d.) age: years		45 (14)		39 (11)		41 (12)		39 (11)		49 (14)
Mean (s.d.) age at onset of illness: years		37 (14)		31 (11)		31 (10)		30 (11)		30 (9)
Mean (s.d.) length of illness: years		8 (6)		8 (4)		9 (5)		9 (5)		19 (9)

The PANSS produces a separate score for positive schizophrenic, negative schizophrenic, and general psychopathology symptoms. Scores for different groups are shown in Tables 2 and 5. Patients who had dyskinesia did not have significantly different scores on negative and general psychopathology symptoms than those without dyskinesia; however, they had higher positive symptom scores ($t=3.51$, $P=0.0005$). Also, patients with Parkinsonism did not have higher negative scores than those without Parkinsonism. When Nigerian patients were compared with a cohort of schizophrenic patients ($n=52$) living in Nithsdale, south-west Scotland, who were slightly younger (mean age 38 years (s.d. 11), $t=2.24$, $P=0.04$) but who were similar in gender distribution (63% males, 37% females) and in length of illness (mean 14 years (s.d. 10)), the Nigerian patients had significantly lower scores on negative symptoms ($t=4.00$, $P<0.0001$) and general psychopathology symptoms ($t=4.91$, $P<0.0001$) (Table 5).

Discussion

Comment is necessary on the determination of age of onset of illness and thus length of illness. In a developing country where psychiatric facilities are scarce and the mentally ill are likely to be taken first of all to a church or to a traditional healer (Jegede, 1981), the use of date of first visit to a psychiatric facility as date of onset of illness is unreliable. Therefore, we use the date of onset of positive symptoms, as reported by the patient or relatives, as the date of onset of illness. However, where a poor history was obtained, date of contact with the psychiatric facility had to be used. It is not surprising, therefore, that the mean age of onset, 31 years, is greater than that in another Nigerian study, namely 25 years (Ohaeri, 1992), in which the year of onset of symptoms was determined more accurately. It must be emphasised, therefore, that the mean length of illness in the present study, 12 years, is a conservative estimate. The present study, however, confirms the earlier age of onset in men, found previously in Nigeria (Ohaeri, 1992) and in developed countries (reviewed by Lewis, 1992).

We found no evidence of dyskinesia, as assessed by the AIMS, in schizophrenic patients who had never been treated; and a gradient of increasing prevalence of dyskinesia, from 10% to 34%, with

Table 4
Medication, age, length of illness, and dyskinesia

Length of time of medication	Mean (s.d.) age: years		Mean (s.d.) length of illness: years	
	Patients with dyskinesia	Patients with no dyskinesia	Patients with dyskinesia	Patients with no dyskinesia
No medication	-	45 (14)	-	8 (6)
Up to 3 months	47 (14)	38 (10)	9 (6)	7 (4)
4-12 months	47 (12)*	40 (12)	11 (5)	9 (4)
1-5 years	40 (12)	38 (11)	10 (5)	9 (5)
More than 5 years	57 (12)***	42 (11)	25 (9)***	15 (7)

*$P=0.03$; ***$P<=0.0001$.

Table 5
Scores on the Positive and Negative Syndrome Scale (PANSS)

PANSS score	Nigerian patients ($n=242$)	Nithsdale patients ($n=52$)
	Mean (s.d.)	Mean (s.d.)
Positive symptoms	13 (6)	13 (5)
Negative symptoms	12 (8)	16 (8)
General psychopathology symptoms	24 (6)	29 (7)

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increasing length of exposure to antipsychotic medication, from up to three months to up to five years, in patients who were of a similar age and who had been ill for a similar length of time. The findings are more in line with the previous study of newly ill patients (Chorfi & Moussaoui, 1985), where no movement disorders were found in untreated patients, than in the study of elderly patients (Owens & Johnstone, 1980, 1982), where the majority of untreated patients had movement disorders. Our study suggests, therefore, that in a group of patients mainly in early middle age and ill for many years, the illness *per se* is not a contributory aetiological factor to movement disorders; medication and the length of its administration are important factors.

It is noteworthy that four of the five patients who had taken medication for up to three months and who had dyskinesia had received their medication *intermittently* over the years; it has been suggested that intermittent therapy may increase the risk of dyskinesia (reviewed by Goldman & Luchins, 1984).

The patients who had received medication for more than five years were different from the others in that they were significantly older and had been ill longer. The prevalence of dyskinesia (45%) in this group is at the upper end of the range (12.3–37.4%) found in a large survey in the USA (Kane *et al*, 1988). The mean age of patients with dyskinesia in this group, 57 years, compared with the mean age of patients without dyskinesia, 42 years (and a similar trend in the four other medication groups), supports previous findings that increasing age is associated with an increasing prevalence of dyskinesia (Kane *et al*, 1988).

Age may exert its effect in at least three ways. Firstly, 'spontaneous' dyskinesias may be found in the elderly; in two studies (Bourgeois *et al*, 1980; Varga *et al*, 1992), 10% and 18%, respectively, of non-schizophrenic elderly people had oral dyskinesia; in another study that examined mostly patients who also had dementia, the figure was 37% (Delwaide & Desseilles, 1977). Secondly, the ageing brain may be more sensitive to antipsychotic medication. Thirdly, elderly schizophrenic patients, by definition (if one excludes late paraphrenia), have been ill for a very long time; perhaps length of illness measured in decades rather than years is a factor. In this context it is noteworthy that Kraepelin (1919), although he did not mention age or length of illness in his description of dyskinesia (see Introduction), described the *end state* "manneristic dementia": "They make singular gestures, affected bows, walk and eat in a manneristic way, shake hands with their thumb or two fingers, smack their lips, and click their tongue".

The two other movement disorders assessed were Parkinsonism and akathisia. The prevalence of akathisia (15%) in patients receiving regular antipsychotic medication was similar to that found in a community of schizophrenic patients living in Nithsdale, south-west Scotland, assessed by the same rating scale (18%) (McCreadie *et al*, 1992*a*). The prevalence of Parkinsonism, however, was less (12% v. 27%). We have no good explanation for this, especially as the mean daily dose of antipsychotic medication was not inconsiderable (477 mg chlorpromazine equivalents). Also, we have no reason to suspect that compliance was poorer, especially as all patients assessed (with the exception of 22 outpatients at Yaba) were in-patients. One possibility, highly speculative, relates to obstetric care. In the Nithsdale survey a strong association was found between Parkinsonism and a history of obstetric complications (McCreadie *et al*, 1992*b*). Possibly fewer Nigerian patients in the present study had a bad obstetric history when compared with Scottish patients, because babies experiencing complications at birth in a developing country are less likely to survive.

Studies of the association between 'tardive' dyskinesia and schizophrenic symptoms have found conflicting results. Dyskinesia has been associated with negative symptoms in some studies (e.g. McCreadie *et al*, 1982; Waddington *et al*, 1987; Brown & White, 1992) but not others (e.g. Iager *et al* 1986; Bartzokis *et al*, 1989; Gold *et al*, 1991), including a Nigerian study (Gureje, 1989). In the present study the association was with positive symptoms. A possible explanation is that patients with positive symptoms are more likely to receive antipsychotic medication and thus develop dyskinesia.

There were few negative symptoms. Symptoms of Parkinsonism sometimes may be confused with negative schizophrenic symptoms (Prosser *et al*, 1987), and thus the low prevalence of Parkinsonism in the present study might explain the low negative symptom scores. However, this is unlikely because patients with Parkinsonism did not have higher negative scores when compared with those without Parkinsonism. A more likely explanation is that patients with marked negative symptoms, such as social withdrawal and poor rapport, may well have been selected out of the present sample by early death. Patients with no contact with relatives (the majority in the present study) and with marked negative symptoms would find survival difficult in a country where one has to work to live. Previous studies of Nigerian schizophrenic patients also have noted the preponderance of positive symptoms and the relative uncommonness of negative symptoms (Sartorius *et al*, 1986; Katz *et al*, 1988; Ohaeri, 1993).

We conclude that dyskinesia found in young and middle-aged schizophrenic patients is likely to be secondary to antipsychotic medication and not part of the illness. The aetiology of dyskinesia in elderly patients remains obscure.

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