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PREVALENCE OF TARDIVE DYSKINESIA AMONG PSYCHIATRIC IN-PATIENTS AT MATHARI HOSPITAL, NAIROBI
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PREVALENCE OF TARDIVE DYSKINESIA AMONG PSYCHIATRIC IN-PATIENTS AT MATHARI HOSPITAL, NAIROBI

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ABSTRACT

Objective: **To determine the prevalence of tardive dyskinesia among psychiatric in-patients.**
Design: **A cross-sectional survey.**
Setting: **Mathari Hospital, Nairobi, the main psychiatric referral hospital in Kenya.**
Subjects: **Two hundred and two randomly selected in-patients seen in the hospital between January and April 2000.**
Results: **The prevalence of tardive dyskinesia was 11.9%. Neither the psychiatric diagnosis nor the sex was significantly associated with tardive dyskinesia. The antipsychotic dosage was also not associated with tardive dyskinesia but an increase in age was significantly associated with the abnormal movements.**
Conclusion: **The prevalence rate of tardive dyskinesia among patients at Mathari Hospital is much lower than that found in western countries but similar to that from Asian studies. These findings indicate the possibility of racial differences in the aetiology of TD. Prospective cross- racial studies are necessary to confirm these findings.**

INTRODUCTION

Tardive dyskinesia (TD) is a neurological syndrome caused by long-term use of neuroleptic drugs. These drugs are generally prescribed for psychotic disorders as well as for some gastrointestinal and neurological disorders. Negative, repetitive, involuntary, purposeless movements characterise TD. Other features of the disorder include grimacing, tongue protrusion, lip smacking, puckering and pursing, and rapid eye blinking. Rapid movements of the arms, legs and trunk also occur.

Estimates of the prevalence of TD range from 0.5 to 62%(1,2). Kane and Smith(3) reviewed 56 studies involving 34,555 neuroleptic treated patients and found an average prevalence rate of 20% as compared with a rate of 5% of spontaneous dyskinesia in 19 samples of untreated individuals. In an earlier analysis of studies from America and Western Europe (1964-1978), Kane and Smith(3) found a range of 0.5 to 56%. The discrepancy was attributed to factors such as the variability of the diagnostic criteria used, assessment methods, duration of neuroleptic exposure, differences in the patients' ages and gender, as well as the possibility of coexisting general medical illnesses.

Studies from non-western countries, including Africa are sparse. Pandurangi and Aderibigbe(4) analysed the prevalence rates of TD in papers published in English and French from Africa up to the year 1993. The average prevalence rate among the Africans was 24%. Chiu and Shum *et. al.*(5) reviewed 11 Asian studies that assessed a total of 8,647 patients. The average prevalence rate was 11.6% (range 2.5-27.6%).

Several factors in association with drug treatment have been identified as contributing to the risk of developing TD. They include, age, psychiatric diagnosis, gender, diabetes, organic brain damage, negative symptoms in patients with schizophrenia, neuroleptic dose, duration of treatment, the number of drug free intervals and the history of acute extra-pyramidal side effects. The prevalence of TD increases steadily with age(6,7). Patients with mood disorders, particularly depression, develop more severe forms of TD(8,9). As regards gender the opinions are divided. Many suggest that females have an increased risk while others hold the opposite view(2).

The prevalence of diabetes, organic brain damage or negative symptoms in patients with schizophrenia may significantly increase the risk of developing TD. There is a positive correlation between the onset of TD and both the total treatment duration and total treatment dose(3). There is some evidence that medication free periods increase the incidence of TD though how it does this is unclear(10). A history of acute onset of extrapyramidal side effects especially parkinsonism are also positively correlated with an early onset of TD(11).

MATERIALS AND METHODS

The study was conducted at Mathari Hospital in Nairobi, Kenya over a four-month period from January to April 2000. Systematic random sampling was used. Every alternate patient who appeared in the ward admission registers during the study period was recruited for the study. Included in the study were all patients who consented and had been on neuroleptics for at least three cumulative months. Excluded were those who were too mentally disturbed to understand or follow instructions and those patients whose records could not be traced.

Diagnosis based on the Diagnostic and Statistical Manual (DSM-IV)(12) was made following assessment using the Standardized Psychiatric Interview (SPI)(13). All patients in the study were on neuroleptics and at various stages of recovery; hence, some of the symptoms and signs necessary for making a particular diagnosis could have been missing in the patient at the time of the interview. In such cases the necessary information was obtained from the patients' files or by re-interviewing the relatives afresh and making the diagnosis retrospectively.

Detection of involuntary movements was done using the Abnormal Involuntary Movement Scale (AIMS)(14). In those cases where dyskinesia were detected the underlying causes were determined by the history, through physical examination and appropriate laboratory investigations. Diagnosis of TD was done using the Schooler and Kane's diagnostic criteria(15). Data analysis was done using the SPSS programme(16) and statistical significance was determined at $p \leq 0.05$.

RESULTS

Two hundred and two patients (108 males and 94 females) were surveyed. The mean age was 35.59 years (SD 10.21) with a range of 16-68 years.

The highest prevalence of TD was found in those aged 60 years and above. Out of a total of six patients in this age group, three (50%) had TD. The lowest prevalence (6.3%) was in the age group 40-49 years. An increase in age was significantly associated with a higher prevalence of TD ($p<0.05$) (Table 1).

Out of the surveyed 202 patients, 24 had TD, giving a prevalence of 11.9%. There was no significant difference between the sexes with regard to the presence of TD (M:F=12.0:11.7) (Table 2).

Table 1

Prevalence of TD by age among Mathari Hospital in-patients

Age (years)	Number of patients	No. with Tardive No. (row %)	Dyskinesia Total percentage
10-19	4	1(25)	0.5
20-29	61	10(16.4)	4.95
30-39	71	6(8.5)	2.97
40-49	48	3(6.3)	1.45
50-59	12	1(8.3)	0.5
>60	6	3(50)	1.45
Total	202	24(11.9)	11.9

$X^2=12.567$ df=5 p=0.028 Significant

Table 2

Prevalence of TD by sex among Mathari Hospital in-patients

Sex	No. of patients	No. with TD (row %)
Male	108	13(6.44)
Female	94	11(5.45)
Total	202	24(11.9)

$x^2=0.05$ df=1 p=0.942 Not significant

The commonest diagnosis was schizophrenia, accounting for 91 cases (45%); followed by bipolar one disorder 48(28.8%); substance use disorder 41(20.1%); major depressive disorder 19(9.4%) and bipolar-two disorder(1.0%). There was only one epileptic patient (0.5%) in the sample. The highest prevalence of TD was found among the schizophrenics (8.9%). The sample size was inadequate for statistical analysis.

Table 3

Prevalence of TD by principal diagnosis among Mathari Hospital in-patients

Principal diagnosis	No. of patients	No. with TD (%)
Schizophrenia	91	18(8.9)
Bipolar 1 disorder	48	2(1)
Bipolar 2 disorder	2	0(0)
Major depressive disorder	19	0(0)
Epilepsy	1	0(0)
Cannabis use disorder	19	1(0.5)
Multiple substance use disorder	17	1(0.5)
Alcohol use disorder	5	2(1)
Total	202	24(11.9)

Table 4

Prevalence of TD by daily neuroleptic dose among Mathari Hospital in-patients

Dose (mg/day)	No. of patients	No. with TD (%)
<500	133	12(5.95)
500-1000	68	12(5.95)
> 1000	1	0(0)
Total	202	24(11.9)

(Dose in mg/day of chlorpromazine equivalent)
$X^2=3.332$ df=2 p = 0.189 Not significant

All patients at the time of the interview were on neuroleptic medication. The mean current dose of

neuroleptics in chlorpromazine equivalents, ranged from 100-1200mg per day (mean 457.43, s d 142.71). Chlorpromazine was the most widely prescribed neuroleptic followed by haloperidol. The daily neuroleptic dose had no relationship to the presence of TD (Table 4).

DISCUSSION

The prevalence rate of tardive dyskinesia among the psychiatric in-patients at Mathari Hospital(11.9%) was relatively low compared to that from the western countries, which had an average of 20%(3), but it was comparable to the rate of 11. 6% from eleven Asian countries(5). A low rate of 9.3% was also recorded among the Chinese in-patients(5).

The low prevalence of TD in the current study is probably due to the low dosage of neuroleptic medications used. The mean current dose in the current study was 457.43mg (sd 142.71) of chlorpromazine equivalents per day. The total drug dose and duration of treatment have been positively correlated with the development of TD in other studies(3). In the current study the dose of neuroleptic bore no relation to the development of TD. The higher doses of anti-psychotic medications used in the western countries could be the result of environmental factors. The chronic exposure to high level of toxins among those in the developed countries as contrasted to low toxin exposures in developing countries has been postulated as one of the reasons why those in the developed countries are able to metabolise and tolerate high levels of drugs. Other possible causes are genetic factors that make the Africans less vulnerable to developing TD. They could be similar to the Asians and the Chinese in this respect. Proofs of these hypotheses await further studies.

Tardive dyskinesia was more frequently encountered among the elderly, three out of six (50%) among those aged 60 years and above, compared with 21 out of 196(10.7%) among those below 60 years. This finding is similar to that found in other studies. Degenerative disorders could account for the tardive dyskinesia that occurs in old age.

Although several studies suggest that the females are more vulnerable to developing TD, the prevalence rates of TD among the males and females were almost similar, 13 out of 108(12%) for males and 11 out of 94(11.7%) for females. Likewise no relation was found between the psychiatric diagnosis and TD. This is similar to the findings among the Chinese by Chiu *et al*(5). Yassa *et al*(2) however recorded higher rates among those patients that had mood disorders compared to the other diagnostic groups.

In conclusion, it is thought that the use of the newer atypical antipsychotic drugs such as olanzepine, clozapine and risperidone could be better alternatives as they induce fewer extra-pyramidal side effects compared to the typical drugs. The high cost of these drugs, however still limits their use.

REFERENCES

1. Kane, J.M. Tardive dyskinesia. In Eds. Jeste D V & Wyatt, R.J. *Neuropsychiatric Movement Disorders.* American Psychiatric Press. Washington D C. 1984; pp. 68-95.
2. Yassa, R. and Jeste, D.V. Gender differences in tardive dyskinesia: A critical review of literature. *Schizophrenia Bulletin.* 1992; **18:**701-715.
3. Kane, J.M. and Smith, J.M. Tardive dyskinesia: prevalence and risk factors, 1959-1979. *Archives of General Psychiat.* 1982; **39:**473-481.
4. Pandurangi, A.K. and Aderibigbe, Y.A. Tardive dyskinesia in non-western countries, a review. *Europ. Arch. Psychiat. and Clinical Neuroscience.* 1995; **246:**47-52.
5. Chiu, H., Shum. P., Lau, J. and Lau, L. and Lee, S. Prevalence of tardive dyskinesia, tardive dystonia and respiratory dyskinesia among Chinese psychiatric patients in Hong Kong. *Amer. J. Psychiat.* 1992; **149:**1081-1085.
6. Casey, D.E. Tardive dyskinesia. In: Miller H Ed. *Psychopharmacology: The Third Generation of Progress.* Raven New York. 1984; pp.1411-1419.
7. Smith, J.M. and Baldessarini, R.J. Changes in prevalence, severity and recovery in tardive dyskinesia with age. *Arch. General Psych.* 1980; **37:**1368-1373.
8. Casey, D.E. Tardive dyskinesia and affective disorders. In. Gardos, G. Casey, D.E. Eds. *Tardive Dyskinesia and Affective Disorders.* American Psychiatric Press. Washington D.C. 1984; pp. 1-20.
9. Kane, J.M., Woerner, M., Weinhold, P. *et. al.* Incidence and severity of tardive dyskinesia in affective illness. In: Eds. Gardos, G. & Casey, D.E. *Tardive dyskinesia and Affective Disorders,* American Psychiatric Press. Washington D.C. 1982; pp. 1-20.
10. Egan, M.F., Hurd, Y., Hyde, T.M., Weinberger, D.R., Wyatt, R.J. and Klainman, J.E. Alterations in M-RNA levels of D_2 receptors and neuropeptides in striatonigral striappallidal neurons of rats with neuroleptic induced dyskinesia. *Synapse.* 1994; **18:**178-179.
11. Kane, J.M., Woerner, M, Weinhold, P. *et. al.* Incidence of tardive dyskinesia: Five year data from a prospective study. *Psychopharmacology Bulletin.* 1982; **198:**387-389.
12. American Psychiatric Association. *Diagnostic and Statistical Manual 4th edition* (DSM-IV). American Psychiatric Association. Washington DC, 1994.
13. Goldberg, D.P., Cooper, B., Eastwood, M.R., Kendward, H.B and Shepherd, M.A. Standard Psychiatric Interview for use in Community survey. *Brit. J. Preventive and Social Medicine.* 1970; **24:**18-23.
14. Guy, W. Ed. *ECDEU Assessment Manual* for *Psychopharmacology, revised,* Rockville, M.D: National Institute of Mental Health, DHEV Publication No (ADM 76-338), pp 534-547.
15. Schooler, N.R. and Kane, J.M. Research Diagnosis for Tardive Dyskinesia. *Arch. General Psych.* 1982; **39:**486-487.
16. Microsoft Incorporation. Statistical Package for Social Sciences, 1987.
17. Bergen, J.A., Kitchin, R. and Berry, G. Predictors of the course of tardive dyskinesia in patients receiving neuroleptics. *Biological Psych.* **32:**580-594.
18. Yassa, R. and Nair, N PV. A 10-year follow-up study of tardive dyskinesia. *Acta Psych. Scandinavica.* 1992; **86:**262-266.
19. Yassa, R., Nair, V. and Schwartz, G. Tardive dyskinesia and the primary psychiatric diagnosis. *Psychosomatic.* 1984; **25:**135-138.