Seasonality of psychotic mental hospital admissions in Kano, Nigeria

[1,2]Abdullahi A. T., [1]Nuruddeen M., [3]Abiola T.

[1]Department of Psychiatry, Aminu Kano Teaching Hospital, Kano, Nigeria; [2]Department of Psychiatry, Bayero University Kano, Nigeria; [3]Department of Medical Services, Federal Neuropsychiatry Hospital, Barnawa-Kaduna, Nigeria.

Corresponding author:

Abiola T., Department of Medical Services, Federal Neuropsychiatric Hospital, Barnawa, Kaduna, Nigeria. Email:

abiolatob@yahoo.com

Abstract

Background: Seasonal variation has been reported for psychotic hospital admissions, but none in Nigeria. This study examines the seasonality of psychotic mental hospital admissions in Kano, a north western state in peri-equatorial and tropical Nigeria.

Methodology: The case notes of all psychotic patients (bipolar affective disorder, schizophrenia, and other psychotic disorders) with more than one admission into the psychiatric unit of Aminu Kano Teaching Hospital between 1996 and 2006 were examined for evidence of seasonal variations and admission patterns.

Results: Using the chi-square test, no significant seasonal variation was found in all the psychotic admissions examined. However, high rate of psychotic admissions were observed in summer.

Conclusion: Geographical factors and seasonal variations have a more limited effect on psychotic mental hospital admissions in Kano than might have been expected from the literature and prevailing local beliefs.

Key Words: Seaonality, Psychotic Illness, Mental Hospital Admission, Kano, Nigeria

Introduction

Seasonal fluctuations have long been documented in relation to many aspects of human physiological functioning, mood and behavior.[1] Such fluctuations have also been documented in mental illness admission patterns. While some studies identified summer/autumn peak[2-5] for psychoses admissions, others did not find such seasonal variations.[6,7] The trend for schizophrenic admissions has tended to parallel those for bipolar disorders, with admissions peaking in the summer months of June and July.[6]

The precise cause of these fluctuations is a subject of debate, but the argument seemed to be in favor of biological and environmental variables.[4,5,8] Sociodemograhics like gender and age are other influencing variables.[9,] Specifically, the female gender has been related more to seasonality in schizophrenia compared to mania with equal representation in both sex.[9] Neurotransmitters like

melatonin[10] and serotonin[11,12] have also been related to the mechanisms by which seasonal changes precipitate relapses of psychosis.[10]

A study in North Africa finds seasonal variation in mania to peak during the summer season[13] like in some Euro-American studies.[2-5] A Nigerian study from the south look at rsing admission pattern of psychiatric illness during the winter and did not take specific diagnosis into consideration.[14] This study aimed to fill this gap in dearth of study from Nigeria and therefore provided pattern of seasonal variation in psychotic admissions in Kano, Northern Nigeria. It also aimed to identify sociodemographic variables that were associated.

Methodology

Place of study

The study was conducted in Aminu Kano Teaching Hospital (AKTH), a tertiary health institution with a capacity of 376 beds and an occupancy rate of 70%. It had 13, 396 admissions in 2006 and an outpatient attendance of 58, 840 (obtained from the hospital records). AKTH is located in the Kano metropolitan area, the capital of the northwestern state of Kano in northern Nigeria, at latitudes 12.0N, 13.0S and longitudes 8.31E, 10.9W.[15] Like other areas in the northern hemisphere, the four seasons; spring, summer, autumn and winter can be described, though much less distinct than the peri-equatorial regions, with an average maximum temperature of 38^0C in the summer and 22^0C in the winter. Kano city is a cosmopolitan city with a population of over 2.8million.[14]

Study procedure

This was a 10 years retrospective study from 1996-2006. Case notes of 100 patients admitted with ICD 10 diagnosis of psychotic disorders into the psychiatry unit of AKTH (and meeting inclusion criteria of more than one admission) were retrieved. Relevant information was extracted using a semi-structured questionnaire designed for the study. This collected information on demographic, educational and occupational data as well as information on family history, substance use, in/outpatient status, admission and follow-up details.

Data analysis

A total of 100 patients met the inclusion criteria. Diagnoses were clinical and the data was analyzed using the Minitab software version 2006. Analyses of seasonal variation across the four seasons for the first and last admissions were carried out using the Chi-square test. The four seasons were defined as including the following months: Spring:

March, April, May; Summer: June, July, August; Autumn: September, October, and November; and Winter: December, January, and February.

Results

Sample characteristics

The sample comprised of 55 males and 45 females with psychotic admissions. Their mean age is 28years (standard deviation = 11.4years) and most (78%) were receiving treatment as outpatients during the study. More than half (52%) are not married and schizophrenia is the diagnosis with the highest representation. Other sociodemographic and clinical characteristics of the participants are presented in Table 1.

Seasonality of psychotic admissions

The overall peak season for first psychotic admissions was recorded in summer (32%) and the nadir in autumn (19%). For the second psychotic admissions, summer season still remains the overall peak while both autumn and winter periods recorded the nadir. There is no significant seasonal variation in the overall pattern of the first (Chi-square = 3.323; p-value = 0.767) and last (Chi-square = 5.981; p-value = 0.425) admissions. These were shown in tables 2 and 3, and figure 1.

Tables 2 and 3 also show the seasonal patterns of the first and last psychotic admissions where schizophrenia is the most common diagnosis in the spring and winter, and bipolar affective disorder is in the summer. Autumn shows peak for both schizophrenia and bipolar affective disorder in the first admission, but for only schizophrenia in the last admission.

Seasonal variations in the specific psychotic disorders were shown in figures 2-4. The peak seasons for bipolar affective disorder in the first and last admissions are both in the summer. Schizophrenia has two peaks (summer and winter) in the first admission and autumn only in the last admission. Other psychotic disorders (i.e acute psychoses, mental and behavioral disorder secondary to psychoactive abuse and undifferentiated cases) peaked in spring and summer in the first and last admissions respectively.

Discussion

The results of this study found a non-significant overall seasonal variation in the rate of first and last admissions for psychoses to peak in the summer. This finding agrees with some studies outside Africa[6,7] for psychotic admissions and a study in Nigeria on general psychiatric admissions.[14] A finding coinciding with the peak of temperature, longer sunshine hours and rainfall that late spring and early summer is noted for in

Kano.[15] This season also tallied with increased melatonin suppression[10] and the least serotonin transporter binding potential in the human brain.[11] Another possible explanation may be respite tactics on the significant others that limit the burden of care on them and allow available others to channeled their resources to agricultural activities that this season is noted for.[14,15]

Bipolar affective disorder is the only psychotic disorder in this study that followed the summer peaks for the first and last admission. This may be more related to the summer suppression of melatonin[10] and lowest serotonin brain binding potential and turnover.[11,12] This explanation may hold true to some extent for the other psychotic disorders that peaked in the spring and summer for the first and last admissions respectively. Schizophrenia seems not to follow this pattern by peaking at both when the brain serotonin binding potential is lowest (summer) and high (autumn and winter). This may be because, dopamine, the neurotransmitter which is more implicated in schizophrenia does not demonstrates seasonal variations.[12]

Table 1: Socio-demographic and clinical characteristics of the participants (N=100)

Variable	Frequency	%
Gender		
Male	55	55.0
Female	45	45.0
Marital status		
Single	52	52.0
Married	48	48.0
Patient current status		
Inpatient	78	78.0
Outpatient	22	22.0
Diagnosis		
Bipolar affective disorder	37	37.0
Schizophrenia	40	40.0
Others*	23	23.0

*=other psychotic disorders like acute psychoses, mental and behavioral disorder secondary to psychoactive abuse and undifferentiated cases

Table 2: Seasonality of first psychotic admissions (N=100)

Variable	Diagnosis			
Seasons	BAD** [n(%)]	Schizophrenia [n(%)]	Others* [n(%)]	Total
Spring	7 (29.2)	9 (37.5)	8 (33.3)	24 (100)
Summer	14 (43.8)	12 (37.5)	6 (18.7)	32 (100)
Autumn	7 (36.8)	7 (36.8)	5 (26.4)	19 (100)
Winter	9 (36.0)	12 (48.0)	4 (16.0)	25 (100)
Test statistics		Chi-square=3.323	p-value=0.767	DF***=6

***=Degree of freedom; **= Bipolar affective disorder; *=other psychotic disorders like acute psychoses, mental and behavioral disorder secondary to psychoactive abuse and undifferentiated cases

Table 3: Seasonality of last psychotic admissions (N=100)

Variable	Diagnosis			
Seasons	BAD** [n(%)]	Schizophrenia [n(%)]	Others* [n(%)]	Total
Spring	7 (30.4)	10 (43.5)	6 (26.1)	23 (100)
Summer	17 (51.6)	9 (27.2)	7 (21.2)	33 (100)
Autumn	6 (27.2)	12 (54.6)	4 (18.2)	22 (100)
Winter	7 (31.8)	9 (40.9)	6 (27.3)	22 (100)
Test statistics		Chi-square=5.981	p-value=0.425	DF=6

**= Bipolar affective disorder; *=other psychotic disorders like including acute psychoses, mental and behavioral disorder secondary to psychoactive abuse and undifferentiated cases

Figure 1: Graphical representation of the first and last admissions

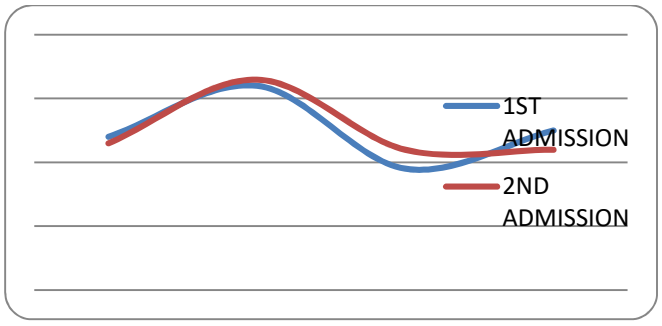


Figure 2: Graphical representation of bipolar affective disorder admissions

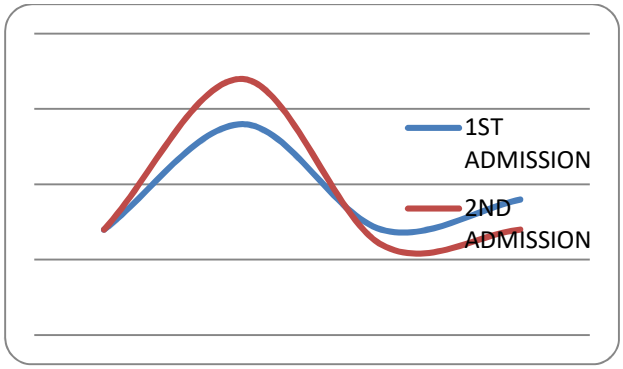


Figure 3: Graphical representation of schizophrenia admissions

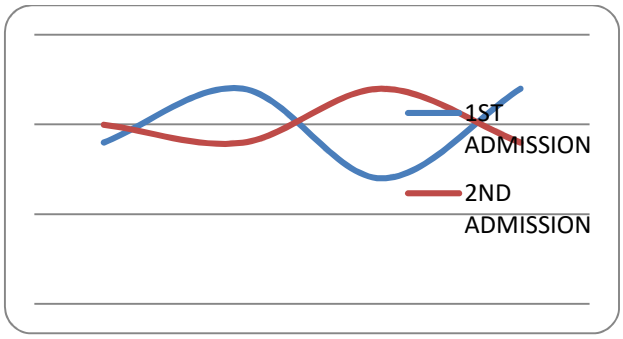
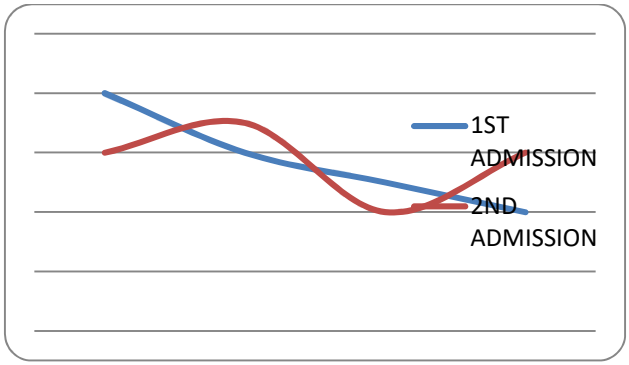


Figure 4: Graphical representation of other psychotic disorders admissions



A major implication of the study finding is that it negates the unsubstantiated popular believe in the northern part of Nigeria that people with recurrent mental illnesses have more frequent relapses in the winter months. However, this negation should be taken with caution as this study has its several limitations such as being retrospective, of limited sample size, restricted to one treatment facility and lack of sociodemograhic comparison. Future studies may address the low sample to be powered sufficiently to reveal seasonal variations. Such study should be prospective and community based to address some of these acknowledged limitations.

Conclusion

There was no significant seasonal variation in the patterns of psychotic admissions in Kano despite recording high summer rates. It appeared that geographical factors did play limited role in the observed pattern of admissions for bipolar affective disorders, lesser in other psychotic disorders and none in schizophrenia admissions. This supported some previous studies findings of no climatic influence on the admission pattern of psychotic disorders and nullifies prevailing local winter beliefs of recurring mental hospital admissions.

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