Correlates of Psychosis Among Patients with Seizure Disorders in a Neuropsychiatric Hospital in Nigeria

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Abstract: Psychosis may complicate epilepsy. The aim of this study was to estimate the prevalence of Psychosis among patients with epilepsy and to examine its socio-demographic and clinical correlates. This study was a descriptive cross-sectional study that involved the use of General Health Questionnaire, version 28(GHQ-28) and the Composite International Diagnostic Interview (CIDI), which were used to investigate each of the 400 consecutive participants. The diagnosis of epilepsy was based on the International Classification of Diseases (ICD-10) diagnostic criteria and all participants with Psychosis were diagnosed using CIDI. A proforma Questionnaire was used to assess the socio-demographic and clinical variables among the participants. Logistic regression was done to determine the predictors of psychosis. Thirty-two participants (8%) were diagnosed as having psychosis. Unemployment and GHQ caseness were predictors of Psychosis among the participants (p=0.038, p=<0.001 respectively). The study showed the existence of Psychosis among patients with seizure disorder. This is an important association with seizure disorders which has implications on the course of the disorder. The assessment of these patients for this co-morbidity and identification of the factors that leads to unemployment among people with seizure disorder will enhance treatment outcome.

Keywords: Epilepsy, Psychosis, Correlates

1. Introduction

The word "epilepsy" was created from the Latin and Greek words and it means "seizure" or "to seize upon". It was mention in Indian Ayurveda as well as the bible Mark 9:17-22 [1, 2]. Epilepsy is found in all mammalian species with increasing frequency as the complexity of the brain increases [3]. It is one of the most common neuropsychiatric disorders in the world [4, 5]. It is the most common non-infectious neuropsychiatric disease in developing countries including Nigeria [4]. Epilepsy affects at least 50 million people in the world and about 100 million people will have at least one epileptic seizure at some time in their lives. It affects all ages with over 10 Million affected in Africa. Epilepsy results in a lot of suffering for those who are affected. In African rural and urban communities, epilepsy is often attributed to mystical causes such as witchcraft which is often treated by traditional healers [6]. Persons with epilepsy experience stigma resulting in discrimination in education, employment and marriage. This is due to the fact that epilepsy is considered highly contagious and disgraceful disease in Africa [7]. Quite a lot of studies have shown that about 50% of patients with epilepsy develop psychiatric disorders. Depression, anxiety and psychotic disturbances are the most

frequently seen. These psychiatric cco-morbidities are often classified according to the phase of seizure in which they occur namely; ictal, pre-ictal/prodromal, post-ictal or inter-ictal [8]. Comorbidity is defined as a condition in where two or more diseases coexist within the same individual at the same time [9].

1.1. Psychosis in Epilepsy

The term psychosis generally referred to a specific disturbance of cognitive functions leading to a distorted perception of reality and characterized by delusions and hallucinations or both [10]. Delusions are usually false, fixed beliefs that are not amenable to change in response to contrary evidence. Hallucinations are perceptual experiences that occur without external stimuli. The term psychosis is also sometimes broadened to include disorganized thinking and catatonic behaviour [10, 11]. Psychotic presentations can occur in any stage of epilepsy, it thus can be pre-ictal, during the seizure or after the seizure [12]. Postictal psychosis is the occurrence of psychotic episodes following a seizure, it is a common and serious comorbidity in patients with epilepsy [13].

1.2. Epilepsy Related Psychosis

Psychotic symptoms that occur during seizure disorder can be divided into two broad groups:

1. Chronic interictal psychosis: It has no temporal relationship with seizure and it is often called chronic schizophrenia-like psychosis of epilepsy.
2. Transient psychosis of epilepsy. Has a temporal relationship with seizure. It is further divided into ictal and postictal transient psychosis of epilepsy. The transient ictal psychosis is a direct manifestation of the current ongoing seizure, while postictal psychosis occurs less than one week after seizure has stopped [14]

Slater and Beard did studies on how to differentiate chronic interictal psychotic symptoms of epilepsy from schizophrenia. They called the chronic interictal psychosis schizophrenia-like psychosis of epilepsy (SLPE) because of the similarities between the two. They postulated the following:

a) Psychosis tends to occur at a later age in epilepsy (about 30years), compared to schizophrenia where psychosis often presents at around 20years
b) Schizophrenia-like psychosis of epilepsy often lacks the premorbid personality abnormalities seen in patients with schizophrenia
c) Schizophrenia-like psychosis of epilepsy presents with more affective symptomatology than in schizophrenia
d) They are less likely to exhibit negative symptoms when compared to schizophrenia
e) They respond to lower doses of antipsychotics when compared to schizophrenia [15].

Weisholtz et al in 2014 noted that psychotic symptoms account for a significant comorbidity for a subset of patients with epilepsy. They also suggested that psychotic symptoms

may be either chronic or episodic. The chronic interictal psychosis is said to occur in about 10% of patients with epilepsy and it is mostly associated with Temporal Lobe Epilepsy (TLE). Episodic psychotic symptoms during epilepsy can be classified by their temporal relationship with seizure; i.e. ictal, postictal or interictal [14]. A study by Montagne revealed that the incidence of psychotic symptoms in epilepsy to be 4.2% whereas the incidence of psychotic features in the general population is 2%; it is thus clear that the incidence of psychosis in epileptics is more than twice that in the general population. Also, the percentage of schizophrenia-like psychosis in epileptic patients is about 2.8%, thus schizophrenia-like symptom is probably the most dominant type of psychosis in people living with epilepsy [16].

A study done in Neuropsychiatric Hospital, Aro, Abeokuta, Ogun State by Okewole et al revealed that the most frequent diagnosis of psychosis in epileptic patients is schizophrenia(40.8%) while brief psychotic disorder accounts for 25.9% [17]. A somewhat similar study was the one done by Tunde-Ayinmode et al (2014) where they used a two stage procedure of General Health Questionnaire (GHQ) and then Schedule for Clinical Assessment in Neuropsychiatry (SCAN). They noticed that more than half of the patients had less than one seizure episode per month, 22.2% had partial epilepsy; 63.5% generalized; and 14.3%, unclassified seizures. Psychopathology was found in 28.6% of their participants out of which depressive disorders accounted for 66.7%. Psychotic disorders, anxiety disorders and dementia each amount to 11.1%. Psychopathology was more common in women, those older than 40 years old and those with partial epilepsy. They however discovered that one third of patients with epilepsy have undetected and untreated psychopathology [18]. The drawback to their study was that a small sample size of 63 was used but in the present study, 400 respondents were studied.

Studies have shown that psychotic experiences can be precipitated by newer antiepileptics like Levatiracetam, Topiramate and Lamotrigine. The risk was least with Carbamazepine [19]. There have been instances where brief episodes of abnormal behaviour have been recorded after a sudden and dramatic reduction in seizures by the use of anti-epileptic drugs (AEDs). This phenomenon is called forced normalization or alternative psychosis. Forced normalization is a paradoxical relationship between seizure activity and behavioural problems [20]. The concept was introduced in 1953 by Landolt where he described psychotic behaviours with total or partial normalization of EEG [21-23]. The mechanism of forced normalization is still not fully understood, some researchers however had proposed the concept of the kindling phenomenon, the phenomenon of long-term potentiation and the channel disorder theory. Another common theory is that epileptiform discharges may mimic electroconvulsive therapy in a localized area of the brain with the seizure suppression leading to psychosis [20]. Recent studies by Clancy et al have estimated that the prevalence of psychosis in a population based studies at

between 2-7% while the estimated prevalence of psychosis is 10-19% in patients with Temporal Lobe Epilepsy or refractory epilepsy [24].

There is no fixity in the presentation as the epileptic patient may experience any type of psychiatric symptom during either length of psychotic episode [21]. There is another concept of Psychic seizure which is defined as simple partial seizures manifesting themselves as psychic phenomena. Psychic seizures are subjective phenomena and not objective dysfunctions. It is the phenomenon of psychic seizure that is believed to be the reason for the high incidence of psychiatric symptoms in patients with temporal lobe epilepsy (TLE). The relationship between seizure and psychosis have been of clinical interest for a long time but the link with schizophrenia is not clear [25]. The theory that epilepsy protected against psychosis led to the use of convulsive therapy in psychotic patients in the 1930s [1]. Recent studies have shown that a chronic schizophrenia-like psychosis occurs more often than not and that the occurrence of epilepsy and psychosis is not a coincidence. It is also clearer that psychotic symptoms often develop about 14 years after the onset of the seizure. Many patients with epilepsy related psychosis however have Schneider's first rank symptoms of schizophrenia at some point in time [26].

2. Objective

To determine socio-demographic and clinical factors that are associated with the occurrence of Psychosis among patients with seizure disorders at Federal Neuropsychiatric Hospital, Kware Sokoto.

3. Methodology

The study was carried out at the outpatient department of the Federal Neuropsychiatric Hospital, Kware Sokoto, Nigeria. The sample size of 400 was derived using the sample size estimate for proportion (27, 28). In an earlier study conducted by Longe and Osuntokun in 1989, the prevalence of epilepsy in the general population was 6/1000, while Gureje in 1991 reported a prevalence of 37.3%.

The Clinical diagnosis that was used to define epilepsy was the International Classification of Diseases (ICD-10) codes for Epilepsy and Seizures. While the Psychosis module of the Composite International Diagnostic Interview (CIDI) was used to define Psychosis.

Adults diagnosed with seizure disorder for at least 6months prior to participation, that utilize the healthcare facility and that accepted to participate in the study were recruited consecutively. The exclusion criteria were: 1) Participants that are below 18years or above 60 years 2) Non epileptic patients, 3) Patients that declined to participate 4) Patients with status epilepticus, active psychotic symptoms which could not allow probable interview or other life threatening conditions. Approval for the research was obtained from the Health Research Ethics Committee of the Federal Neuropsychiatric Hospital, Kware, and Sokoto.

Participants were interviewed using a semi-structured socio-demographic questionnaire designed by the researchers using relevant literatures. The questionnaire detailed the socio-demographic variables of the respondents like age, gender, marital status, ethnicity, employment status, place of residence, educational status, and religion. This was the introductory aspect of the questionnaire.

The Psychological and Clinical variables documented were the duration of illness, frequency of seizure, age at illness onset, previous substance use disorder, presence of recurrent/uncontrolled seizure, any current use of antiepileptic(s), presence of previous hospital admission, recurrent presence of fear of having seizure, level of social support, change in lifestyle and family history of mental illness. The socio-demographic questionnaire and the English or Hausa version of the General Health Questionnaire (GHQ) questionnaire (A self-administered validated screening aimed at detecting psychiatric disorders in the general population) was then administered on all the participants. All patients were further assessed using the Psychosis module of Composite International Diagnostic Interview –CIDI {A fully structured validated instrument developed for the assessment of psychiatric disorders according to the diagnostic criteria of International Classification of Diseases (ICD) and Diagnostic and Statistical Manual of Mental Disorders (DSM)}

3.1. Study Design

It was a descriptive cross-sectional study.

3.2. Data Analysis

Data collected was analyzed using the Statistical Package for Social Sciences (SPSS) version 20. The numerical (continuous) data were subjected to means and standard deviations (S.D) and the means were compared using t-test. For categorical variables, frequency distributions and cross tabulations was generated in each category. The proportions were compared using chi-square (χ^2) test. All the variables were examined for their relationship with Psychosis. All test of significance was set at $p<0.05$. Variables that were statistically significant were further subjected to logistic regression analysis to determine the predictors of the Psychosis in seizure disorder.

4. Results

4.1. Sociodemographic Characteristics of Participants

Four hundred (400) participants with seizure disorders were studied; out of which 266 (66.5%) were males and 134(44.5%) females. The age of the participants ranges from 18 to 60years with a mean of 28.94 years (SD = 9.26). Those between the ages of 18 years and 35years constitute the majority (78%) of the respondents. No respondents came from Social class I/Skilled, but Social class IV/unskilled accounts for 184(46.0%), while 159(39.8%) are unemployed. Majorities are Hausas (353) 88.3%, and married people

accounted for 43.5% (174) of the total population. Only 150(37.5%) have attended primary school and above while majority 394(98.5%) professed the Islamic faith. (Table 1)

Table 1. *General Sociodemographic Characteristics of the Study Subjects.*

Variable	Frequency (No./%)
Age	
18 – 25	180(45.0%)
26 – 33	109(27.3%)
34 – 41	72(18.0%)
42 – 49	21(5.3%)
50 – 57	14(3.5%)
≥58	4(1.0%)
Range:	18 – 60 years
Mean(S.D)	28.94(9.23)
Gender	
Male	266(66.5)
Female	134(33.5)
Occupation	
Skilled/Social class I	0(0.0)
Intermediate/Social classII	7(1.8)
Semi skilled/Social class III	50(12.5)
Unskilled/Social class IV	184(46.0)
Unemployed/Social classV	159(39.8)
Marital Status	
Married	174(43.5)
Divorced	45(11.3)
Separated	2(0.5)
Single	171(42.8)
Widowed	8(2.0)

Variable	Frequency (No./%)
Educational Status	
Primary	50(12.5)
Secondary	80(20.0)
Tertiary	20(5.0)
Islamic	240(60.0)
Nil	10(2.5)
Ethnicity	
Hausa	353(88.3)
Fulani	26(6.5)
Yoruba	3(0.8)
Igbo	1(0.3)
Others	17(4.3)
Religion	
Islam	394(98.5)
Christianity	6(1.5)

4.2. Sociodemographic Characteristics of Participants with Psychotic Symptoms

Higher proportion of females who had seizure, 17(12.7%) were more likely to be psychotic when compared to males 15(5.6%) (χ^2=6.013, p=0.014). Also, there was a significant likelihood of unemployment among the psychotic group; 23(14.5%) when compared to those that were employed 9(3.7%) (χ^2=14.988, p=0.000). The full socio-demographic characteristics are provided in table 2 below:

Table 2. *Comparison of the Sociodemographic Characteristics of the Study Subjects in the Psychotic and Non-psychotic Group (N=400).*

Variable	Non Psychotic group (No./%)(N=368)	Psychotic group (No./%)(N=32)	X^2 / t	D.F	P
Age group in years					
18 – 40	326(91.8%)	29(8.2%)			
41 – 60	42(93.3%)	3(6.7%)	t =0.349	398	0.727
Mean(S.D)	29.11(9.29)	27.03(8.81)			
Gender					
Male	251(94.4)	15(5.6)	X^2 =6.013	1	0.014
Female	117(87.3)	17(12.7)			
Occupation by Social Class					
Unemployed/Social classV	136(85.5)	23(14.5)	X^2=14.988	1	<0.001
Others	232(96.3)	9(3.7)			
Marital Status					
Married	164(94.3)	10(5.7)	X^2 =2.124	1	0.145
Others	204(90.3)	22(9.7)			
Educational Status					
Western Education	141(93.4)	10(6.6)	X^2 =0.625	1	0.429
Nil/Islamic	227(91.2)	22(8.8)			
Ethnicity					
Hausa	325(92.1)	28(7.9)	X^2 =0.019	1	0.780
Others	43(91.5)	4(8.5)			
Religion					
Islam	363(92.1)	31(7.9)	X^2 =0.622	1	0.396
Christianity	5(83.3)	1(16.7)			

4.3. Psychological Characteristics of Participants in the Psychosis Group

Table 3 showed that among the 32 respondents that had psychotic symptoms with seizure disorder, there were significant differences between those with seizure fear and those without 14(43.8%) vs. 18(56.2%); and those that experienced life style change and those without 27(84.4%) vs. 5(15.6%), (χ^2=9.007, P=0.003 and χ^2=20.621, P=0.000 respectively). The full psychological characteristics of the respondents were provided below.

Table 3. *Comparison of The Psychological Characteristics of the Study Subjects in the Psychotic and Non-psychotic Group (N=400).*

Variables	No Psychosis group (No./%)(N=368)	Psychosis group (No./%)(N=32)	X^2	D.F	P
Fear of having seizure					
No	292(79.3)	18(56.2)	9.007	1	0.003
Yes	76(20.7)	14(43.8)			
Seizure worry					
No	206(56.0)	14(43.8)	1.779	1	0.182
Yes	162(44.0)	18(56.2)			
Change in lifestyle					
No	211(57.3)	5(15.6)	20.621	1	0.000
Yes	157(42.7)	27(84.4)			
Social support					
Reduced	46(12.5)	2(6.2)	1.156	2	0.561
No change	164(44.6)	16(50.0)			
Increased	158(42.9)	14(43.8)			
Family history of mental illness					
No	289(78.5)	23(71.9)	0.760	1	0.383
Yes	79(21.5)	9(28.1)			

4.4. Clinical Characteristics of Participants in the Psychosis Group

Table 4 showed that patients with Grand mal seizure had less likelihood of having psychotic symptoms 19(6.3%) when compared to other forms of seizure; 13(13.3%) (χ^2=4.889, p=0.027). The presence of physical complication was more likely in those with psychotic symptoms 11(13.4%) when compared to those without psychotic complication 21(6.6%) (χ^2=4.109, p=0.043). More also, the presence of seizure in the last one month was significantly associated with having psychotic symptoms 25(12.2%) when compared with those without any seizure in the previous one month 7(3.6%) (χ2=10.055, p=0.001). Other associated clinical variables were depicted in table 4 below:

Table 4. *Comparison of the Clinical Characteristics of the Study Subjects in,the Psychotic and Non-psychotic Study Group (N=400).*

Variables	No Psychosis group (No./%)(N=368)	Psychosis group (No./%)(N=32)	X^2 / t	D.F	P
Seizure Diagnosis					
Grand Mal	283(93.7)	19(6.3)	X^2=4.889	1	0.027
Others	85(86.7)	13(13.3)			
Age at seizure onset(yrs)					
0 – 9	83(86.5%)	13(13.5%)			
10 – 19	155(93.4%)	11(6.6%)			
20 – 29	87(93.5%)	6(6.5%)			
30 – 39	34(97.1%)	1(2.9%)	t= 2.075	398	0.039
40 – 49	5(83.3%)	1(16.7%)			
≥50	4(100.0%)	0(0.0%)			
Range: 1 - 59					
Mean(S.D)	16.73(13.49)	12.72(10.36)			
Duration of seizure (months)					
0 – 99	149(93.7%)	10(6.3%)			
100 – 199	118(92.2%)	10(7.8%)			
200 – 299	71(89.9%)	8(10.1%)			
300 – 399	23(92.0%)	2(8.0%)	t= -1.555	398	0.121
400 – 499	5(83.3%)	1(16.7%)			
≥500	2(66.7%)	1(33.3%)			
Range: 6 – 510					
Mean(S.D)	144.38(99.61)	173.56(124.95)			
Duration since last Seizure(Days)					
0 – 100	258(90.2%)	28(9.8%)			
≥ 101	110(96.5%)	4(3.5%)	t= 2.716	41.754	0.010
Range: 1 – 5475					
Mean(S.D)	224.01(571.94)	45.16(92.49)			
Physical complications					
No	297(93.4)	21(6.6)	X^2=4.109	1	0.043
Yes	71(86.6)	11(13.4)			
Seizure in the last one month					
No	188(96.4)	7(3.6)	X^2=10.005	1	0.001
Yes	180(87.8)	25(12.2)			
Hard drug prior seizure			X^2=0.017	1	0.752

Variables	No Psychosis group (No./%)(N=368)	Psychosis group (No./%)(N=32)	X^2 / t	D.F	P
Seizure Diagnosis					
No	336(92.1)	29(7.9)			
Yes	32(91.4)	3(8.6)			
Current hard drug use					
No	342(92.2)	29(7.8)	X^2=0.234	1	0.718
Yes	26(89.7)	3(10.3)			
Seizure Drug(Transformed)					
Monodrug	330(91.4)	31(8.6)	X^2=1.735	1	0.345
Multiple Drugs	38(97.4)	1(2.6)			
Medical disorder					
No	332(92.2)	28(7.8)	X^2=0.242	1	0.546
Yes	36(90.0)	4(10.0)			
Previous Hospitalization					
No	331(93.2)	24(6.8)	X^2=6.586	1	0.018
Yes	37(82.2)	8(17.8)			
Maternal Pregnancy complications					
No	262(91.9)	23(8.1)			
Yes	4(66.7)	2(33.3)	X^2=5.603	2	0.061
Not reported	102(93.6)	7(6.4)			
Delivery complications					
No	259(91.8)	23(8.2)			
Yes	7(77.8)	2(22.2)	X^2=2.852	2	0.240
Not reported	102(93.6)	7(6.4)			
GHQ Caseness					
No	317(96.4)	12(3.6)	X^2=47.710	1	<0.001
Yes	51(71.8)	20(28.2)			
EEG Report					
Negative	150(92.0)	13(8.0)	X^2=0.000	1	0.988
Positive	218(92.0)	19(8.0)			

4.5. Multivariate Logistic Regressions for the Predictors of Psychosis in the Study Groups

Logistic regression analysis was done for psychotic features using variables that were significant on cross tabulation and t-test. The variables used at these instances are: gender, occupation, fear of having seizure, change in lifestyle due to seizure, seizure diagnosis, age at onset of seizure, duration since last seizure, physical complication, seizure in the last one month, previous hospitalization and GHQ caseness. Only GHQ caseness (p=<0.001) and employment status (p=0.036) were predictive of psychosis. See Table 5 below.

Table 5. *Logistic Regression Analysis for The Predictors of Epilepsy Related Psychosis In studied Participants.*

Predictor Variable	B	P Value	Exp(B)	Exp(B) (95%CI)	
				Lower	upper
Gender	0.058	0.902	1.131	0.445	2.878
Employment Status	-1.051	0.036	0.350	0.130	0.945
Fear of Having Seizure	-0.345	0.445	0.711	0.296	1.709
Life style Change	-0.977	0.093	0.356	0.116	1.090
Seizure Diagnosis	-38.271	0.999	0.449	0.185	1.088
Age at seizure onset	-0.371	0.118	0.697	0.437	1.110
Last seizure Duration	-0.002	0.296	0.999	0.995	1.003
Seizure Complication	-0.036	0.942	0.893	0.347	2.295
Seizure in the last one month	0.692	0.204	1.419	0.432	4.661
Previous Hospitalization	-0.663	0.213	0.506	0.179	1.428
GHQ Caseness	-1.174	0.000	0.190	0.079	0.454
Constant	57.381	0.999	4.212		

5. Discussion

Psychiatric morbidity is a significant feature of seizure disorder to the extent that some researchers anticipated the addition of such comorbidities in seizure diagnostic criteria [29]. The focus of this study was the correlates of Psychosis in people already having seizure disorder which is a common comorbidity with seizure disorder [30, 31]. In this study, not only the prevalence but the predictors of Psychosis in seizure patients were examined.

5.1. Socio-Demographic Variables

This study demography showed that most of the patients were young adults with the mean age of the study population being 28.94±9.26. Also there was a male preponderance in

this study 264(66.5%) with a sex ratio of about 2:1. This is similar to what was obtained in a study done in Bauchi by KazeemAyinde and DaudaSulyman, where they reported a mean age of 30.55±10.91 years and a similar sex ratio [32]. This shows that seizure was more prevalent in young adult males in the productive age group and if those that were expected to take care of not only themselves but other family members were the victims of seizure disorder with its attendant disability, the productiveness of the society is diminished with lots of burden on the patients [33]. It may also show that males may be freer in our society to seek help as a result of their economic advantage when compared to females and it may not just be due to more males having seizure [34]. However, more males have more childhood epilepsies which may account for the higher prevalence among males as those with childhood epilepsy survived to become adults [35, 36]. Only 34.5% of the participants had Primary education and above, with 62.5% having non-formal or religious education only. This finding on educational attainment was slightly different from what was quoted by Kazeem et al where they quoted 47.3% in Bauchi. The higher rate of educated people in their own study may be due to them using a higher participants' age range of up to 68years and a smaller sample size of 74 [32]. Also, according to a 2011 world bank report, Sokoto has one of the lowest primary school enrolments in Nigeria at 34.3 percent compared to Bauchi State at 43.6 percent; which makes the lower rate reported in this study unsurprising [37].

There was preponderance of the unskilled and the unemployed (46.0% and 39.8% respectively). This can be explained by the numerical superiority of such groups in the general populace, and the peculiarity of Sokoto State in the poverty index of Nigeria. The attractiveness of our hospital to people of low socio-economic status may also be due to the alliance of the hospital with the Sokoto State Zakat initiative where drugs were given at no cost to the patients. Those who are more economically buoyant may opt not to be seen in a clinic that is known to be exclusively for neuropsychiatric disorders and its attendant stigma and they may go for more expensive private healthcare. This study found that only 43.5% of the respondents were married, this may be due to the fact that there were more young people among the study population that may not yet be socially ready for marriage; although epilepsy may militate against people getting married as reported in an Iranian study by Riasi et al in 2014, where they quoted that only 27.3% of their respondents were married [38].

When Psychotic features were examined, the associated factors were gender difference and occupation. It was clear that the female gender had more likelihood of becoming psychotic as in keeping with previous work done by Tunde-Ayinmode et al where they showed that psychosis was more common in women living with epilepsy (P=0.007) [18]. This risk was further buttressed by a study by Bangar et al which looked into psychiatric conditions in women and they reported an increased risk of both affective disorder and psychosis possibly due to the physiological changes associated with menstruation, pregnancy and menopause, as well as pharmacokinetic and pharmacodynamic changes associated with such physiological states [39]. More also, patients that have psychosis were more likely to be unemployed as it was with a Japanese study by Kazumaru Wada et al in 2001, where they suggested that the higher unemployment may be due to voluntary resignation from their jobs due to occurrence of epileptic seizures, due to dismissal from job as a result of psychosis and epilepsy at work and some was due to discriminatory tendencies of the workplace and the society at large [40]. A 2007 study by Fisekovic et al reported that paranoid ideations and perception of auditory hallucinations were the commonest symptoms in epileptic psychosis which may make patients suspicious of their work colleagues and prevent harmonious working environment for patients [41].

5.2. Prevalence of Psychosis in Seizure Patients

The rate for epilepsy related psychosis in this study was 8%. This corresponds with most of the quoted prevalences like Denise Montagne (4.2%), Gudmundsson et al (9%), Gaitatzis et al (9%); while some studies quoted much lower rates like Swinkels et al (0.5%), and Forsgren et al (0.7%) [6, 42, 43]. Some other studies however quoted higher rates like Gureje et al in 1991, (29%) [31]. These variabilities could also be ascribed to the different instruments used, the different sociodemographic factors of the study populations and whether the participants are acutely diagnosed which will make the psychotic features still very florid before coping mechanisms set in. When compared to studies that have low prevalence rates, the issue of forced normalization or alternate psychosis could be the causative factor, where forceful stoppage of the epileptiform discharges due to drug use can result in patients developing psychosis [14, 21].

5.3. Predictors of Psychosis

Employment status and GHQ caseness were predictors of psychosis in this study (p=0.038, p=<0.001, respectively) after logistic regression analysis was done. The association with gender was lost after the analysis. This finding was further buttressed by Effiong et al in their pathway of care study; they noticed that up to 70% of psychotic people were unemployed [44]. Psychosis entails the presence of delusions, hallucinations or grossly abnormal behaviour in a patient. A study by Elliott et al reported the presence of paranoid delusion as the commonest type of delusion in people suffering from epilepsy while visual hallucination is more common in people with epilepsy related seizure disorder than the epilepsy unrelated psychotic patients [45]. Patients with paranoid delusion often express their resentment and suspicion towards others which is a usual cause of friction between these patients and others that they have interaction with. If the interaction is at the work place the presence of psychosis will make good interpersonal relationship with coworkers very difficult and they would not be able to function as well as expected. This study could not really

show whether it was the epilepsy that triggered psychosis or that the psychosis triggered epilepsy but studies have shown that epilepsy with focus on the temporal or frontal lodes are more associated with higher incidence of psychosis [14, 21]. Psychosis has a negative impact on employment and hardly can a frankly psychotic patient get or sustain a job. They often suffer from frequent job changes, job insecurity and its attendant stress, and lack of empowerment due to many periods of unemployment [46].

The finding of GHQ caseness being a predictor of Psychosis has also been reported in a previous study. The study also noted that GHQ was majorly for anxiety and depression screening which may be due to its less sensitivity to psychotic features [47]. Another validation of GHQ-28 was done by Aderibigbe et al in 1992 against Psychiatric Assessment Schedule (PAS); they found a sensitivity of 82% and a specificity of 85%. The high specificity and sensitivity shows that GHQ-28 is accurate in screening for psychopathologies and useful in screening for psychosis among patients with seizure disorder.

6. Conclusion

This study found the prevalence of psychosis in seizure disorder patients to be relatively higher than that found in some other settings. Mental health professionals should consider the regular assessment of seizure disorder patients with a view to detect those factors that may predispose these patients to psychosis; especially in this study setting. Prompt recognition and treatment of those patients with co-morbid psychosis will lead to a better outcome. Also, this will go a long way in reducing the occurrence of psychosis- induced violence and the antecedent socio-economic consequences. The social factors associated with unemployment among seizure disorder patients will require further investigations and attention by mental health professionals in collaboration with governmental/non-governmental organizations

7. Limitations

The study was a cross-sectional one and thus may not be sensitive to changes in the levels of the measurements over a period of time.

It was a hospital-based study and may not represent entirely what obtains in the community and in Nigeria.

Disclosure

The authors have nothing to disclose
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