PREVALENCE AND PREDICTORS OF DELIRIUM AMONG MEDICAL INPATIENTS ADMITTED THROUGH ACCIDENT AND EMERGENCY UNIT OF JOS UNIVERSITY TEACHING HOSPITAL

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ABSTRACT

Background: *Delirium is a complex neuropsychiatric syndrome, commonly encountered across all healthcare settings. However, little is known about its magnitude and determining factors in medical inpatients especially at the Accident and Emergency (A&E) setting of tertiary institutions in low income countries.*

Objectives: *This study was conducted to evaluate the prevalence of delirium among medical inpatients admitted through the A&E unit as well as to assess its predictors.*

Method: *This was a cross-sectional study that employed a consecutive sampling technique to select 290 eligible subjects from medical inpatients that presented to A&E unit of Jos University Teaching Hospital (JUTH). Confusion Assessment Method (CAM) was used to assess for delirium.*

Results: *The results showed that 35.9% of the respondents had delirium. The predictive variables for delirium were: Age groups 18-34 years and 35-64 years (P=0.014 and P = 0.003), prior cognitive impairment (P = 0.020),having estimated monthly income belowN50,000 (P<0.001 and P=0.008) ,use of alcohol (P=0.026) and having rare/other medical diagnosis (P = 0.0016).*

Conclusion*: Delirium is very common in medical inpatients and highly predictable especially in high risk patients. Consultation-Liaison Psychiatry services need to be integrated into the A&E unit management team particularly in the areas of prevention and management of identified cases.*

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Key Words: *Delirium, Medical Inpatients, Prevalence, Predictors, Accident and Emergency Unit*

Introduction

Delirium is defined as an acute change in cognition that cannot be better accounted for by preexisting or evolving dementia[1]. This change in cognition is rapid, occurring over a period of hours or days with associated disturbance of consciousness and is classically described as fluctuating and reversible[1]. It is characterized by disturbances of memory, orientation, language skills, thinking, perception, motor-behavior, sleep-wake cycle, with impaired

attention as the core cognitive disturbance[1,2].

It is associated with several adverse outcomes which include more prolonged hospitalization, mortality and institutionalization that is even more worrisome in low income countries[3,4].

Despite its frequent occurrence and negative outcomes, delirium is missed by emergency physicians in 57%-83% of cases[5,6]. There is some evidence to suggest that missing delirium in the emergency unit portends higher risk compared to patient whose delirium is detected by the emergency physicians[5].

A meta-analysis of 42 studies reported delirium to be prevalent on emergency unit admission in 10-31% of medical inpatients, and to occur 3-29% in the medical wards[7]. Previous studies carried out among medical inpatients at A&E in USA[8], United Kingdom[9], Australia[10], Spain[11] and Sub- Saharan African Countries[12,13] found prevalence of delirium in the range of 9-35%. Studies have also documented older age, prior cognitive impairment, male gender, severe medical comorbidities, use of psychoactive substances and medications as predictors of delirium[14,15].

In Nigeria, few studies have examined the prevalence and predictors of delirium in medical inpatients with virtually none carried out among them in the A&E setting[16-18].

In the light of the above, the study sought to determine the prevalence of delirium and its predictors among medical inpatients admitted through the Accident and Emergency (A&E) unit of JUTH. Investigating delirium in medical inpatients would therefore have advantage in identifying people who have the greatest need for early intervention thereby reducing the adverse consequences of this condition.

Methodology

This hospital based cross- sectional study was conducted at the A&E unit of JUTH between the months of July and November 2016. Ethical approval was obtained from the ethical committee of JUTH, while permissions were also granted by the heads of Internal Medicine and A&E unit. Data were collected by the researcher and research assistants who are fluent in both English and Hausa languages. Medical inpatients aged 18 years and above, admitted through the A&E unit and screened for delirium within 24 hours of admission were included for the study. Those considered too ill and patients with current diagnoses of mood disorders and schizophrenia were excluded.

The study employed a consecutive sampling of the prospective respondents aged 18years and above who presented within 24 hours to A&E unit of the hospital. The rationale for the 24 hour limit was to maximize the number of patients that could be enrolled, while minimizing the patients' exposure to multiple delirium precipitants such as immobilization, bladder catheter placement or any iatrogenic event[14].

The socio-demographic questionnaire was administered first and this sought information on socio-demographic data (age, gender, level of education,occupation,estimated monthly income and marital status) and clinical variables such as past year substance use, current medication, past history of mental illness, prior cognitive and physical impairments,illness duration before presentation and medical diagnosis.

The Confusion Assessment Method was thereafter administered. This consists of four features that were found to have the greatest ability to distinguish delirium or reversible confusion from other types of cognitive impairment[19].

Confusion Assessment Method evaluates the four key delirium features:

1. Acute onset and fluctuating course
2. Inattention
3. Disorganized thinking
4. Altered level of consciousness.

Delirium is considered present if features (1) and (2) were present in addition to either features (3) or (4)[20].

The Statistical Package for Social Sciences Version 21 (SPSS-21) software package was used to analyze the data.

Results

A total of 302 respondents were interviewed, but 290 comprising respondents between the age range of 22 and 100 years with mean age of 46.2±17.2 years, 164(56.6%) females and 126(43.4%) females and predominantly Christians (84.1%) of the several other ethnic minorities(Tarok,Magavul,Angas,Miango,Ibo,Yoruba,Irigwe,Jukun,Ijaw,Idoma and Tiv) with Berom being the dominant ethnic group, were used for the analysis.

Most of the respondents had below tertiary level of education; 208(71.7%), belonged to nonprofessional occupation group, 220(75.9%) and had their estimated monthly income below N50, 000; 269(92.7%). More than half were married, 165(56.9%).

Similarly, majority of the respondents had been medically ill for less than 2 weeks; 183(63.2%),had diagnosis of infectious diseases; 140(48.3%), were non users of psychoactive substances,(74.5%) and had equal proportions of antibiotics,(30.7%) and other medications such as steroids, cytotoxic, antiretroviral; (30.7%) administered on them.

Among the respondents, only 14(4.8%), 34(11.7%) and 24(8.3%) had previous history of mental illness, preexisting cognitive decline and physical impairment respectively. See Table 1, Figures1 and 2.

Table1: Socio-demographic and Clinical Characteristics of Respondents

Variable	Responses	Frequency(n)	Percentage (%)
Age (years)	18 - 34	118	40.7
	35 - 64	125	43.1
	65 - 100	47	16.2
Mean ± SD		46.22±17.24	
Gender	Male	126	43.4
	Female	164	56.6
Ethnicity	Berom	60	20.7
	Hausa /Fulani	35	12.1
	Others	195	67.2
Religion	Christianity	244	84.1
	Islam	46	15.9
Educational statuy	No formal education	22	7.6
	Primary education	94	32.4
	Secondary education	92	31.7
	Tertiary education	82	28.3
Occupational statuy	Professionals	70	24.1
	Nonprofessionals	123	42.4
	Unemployed	97	33.5
Estimated monthly income	<20,000.00	150	51.7
	20,000.00 - 49,000.00	119	41.0
	≥50,000.00	21	7.3
Marital statuy	Never married	71	24.5
	Married	165	56.9
	Previously married	7	2.4
	Widowed	47	16.2
Mental illness history(Past)	Yes	14	4.8
	No	276	95.2
Prior cognitive decline	Yes	34	11.7
	No	256	88.3
Preexisting physical impairment	Yes	24	8.3
	No	266	91.7
Illness duration before presentation	<2week	183	63.1
	2 - 4week	72	24.8
	>4week	35	12.1
Current Medicatiom	Regular antibiotic	89	30.7
	Antikock ‘s	54	18.6
	Oralhyoglyceamic/insulin	27	9.3
	Antihypertensive	31	10.7
	Othere	89	30.7

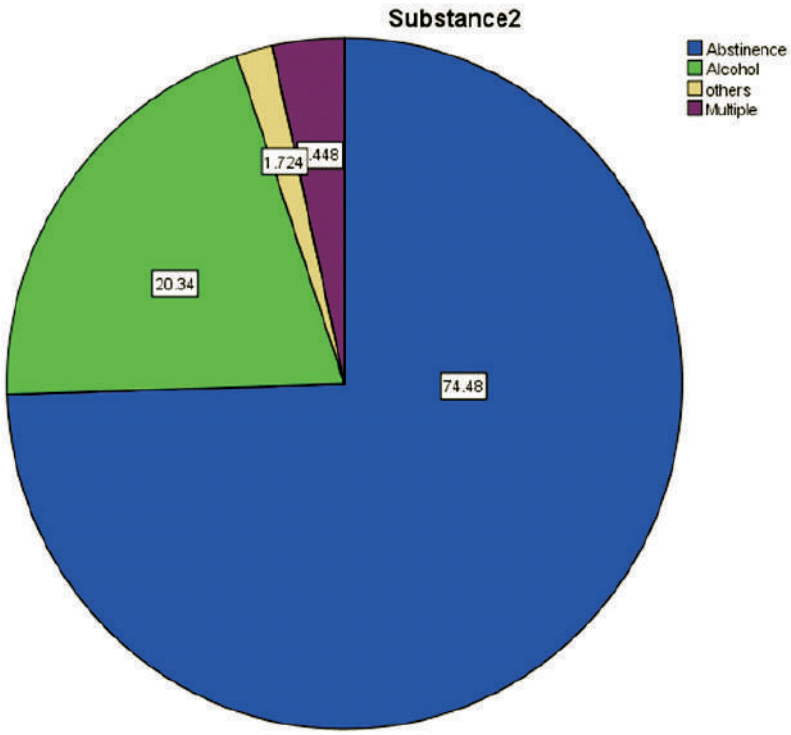

Figure 1:
Distribution
of respondents
according
to type of substance use

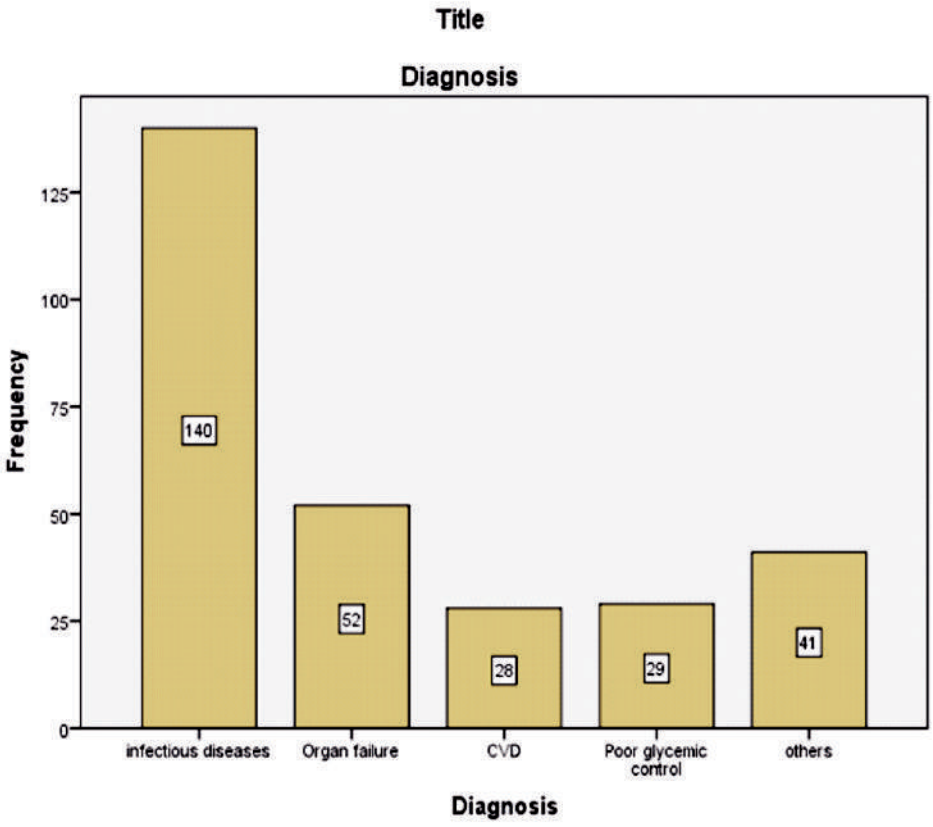

Figure 2:
Distribution
of Respondents
according to
Current
Medical
Diagnoses

Prevalence of Delirium in Medical Inpatients at Accident and Emergency Unit of JUTH

This study found that the proportion of 290 adult-respondents meeting the DSM 5 diagnostic criteriafor delirium was 104(35.9%)using Confusion Assessment Method. See Table2.

Table 2: Prevalence and Distribution of Delirium among the Respondents

Delirium	Frequency	Percentage
Yes	10 4	35. 9
No	18 6	64. 1
Total	29 0	10 0

Socio-demographic and Clinical Predictors of Delirium

Among the medical inpatients, being inthe age groups 18 – 34years and 35-64 was more than four times likely to predict delirium compared to those age group 65-100 years(P≥0.014 and P ≥ 0.003). In the same manner, having estimated monthly income less than 20,000 and 20-49,000.00 was 13 and 4 times more likely to predict the development of delirium compared to having income ≥ 50,000.00 respectively, (P<0.001 and P≥0.008).

On the other hand, the odds of having delirium were decreased by 0.241 among those without prior cognitive decline compared to those withand this decrease was statistically significant (P ≥ 0.020). Similarly, the odds of having delirium was significantly reduced by 0.236 among those having diagnosis of organ failure compared to those who were classified as having other medical diagnosis (P≥ 0.016). Those that were non users of substance were over 37.7 times more likely to have delirium compared to participants using multiple substances (P≥0.002), so also was the use of alcohol being 13.2 times more likely to predict delirium compared to

Table 3: Predictors of Delirium among Medical Inpatients

Variable	Odd Ratio	95%Confidence Intervall	P
Age in years			
18 - 34	4.24 9	0.01 4 — 13.51 6	**0.01 4**
35 - 64	4.67 7	0.00 3 — 12.74 8	**0.00 3**
65 - 100	1.00 0		
Gender			
Male	1.33 6	0.39 6 — 2.61 0	0.39 6
Female	1.00 0		
Occupation			
Professionals± degree	1.29 0	0.63 0 — 3.63 7	0.63 0
Non professionals	0.83 6	0.67 6 — 1.93 4	0.67 6
Unemployed	1.00 0		
Income			
N<20,000.0	13.82 7	0.00 0 — 51.54 7	**0.00 0**
N20 - 50,000.0	4.87 9	0.00 8 — 15.64 2	**0.00 8**
>50,000.0	1.00 0		
Prior cognitive decline			
N0	0.24 1	0.02 0 — 0.80 1	**0.02 0**
Yes	1.00 0		
Medical Diagnoses			
Infectious Disease	0.58 9	0.31 6 — 1.65 8	0.31 6
Organ Failure	0.23 6	0.01 6 — 0.76 2	**0.01 6**
CVD	0.57 8	0.41 6 — 2.16 9	0.41 6
Poor Glycemic Control	0.42 4	0.21 9 — 1.66 7	0.21 9
Others	1.00 0		
Past Year Substance Use/ Type			
Abstinence	37.65 5	0.00 2 — 362.35 8	**0.00 2**
Alcohol	13.24 1	0.02 6 — 128.29 5	**0.02 6**
Others	8.37 2	0.13 8 — 138.96 3	0.13 8
Multiple	1.00 0		

Discussion

This study found that the proportion of adult-respondents meeting the DSM 5 diagnostic criteria for delirium was 35.9% using CAM. This finding is similar to those of Ajiboye and Adelekan[16] from Nigeria, and Gonzalezet al[11] from Spain. Ajiboye and Adelekan[16] in a study conducted among inpatients in a Nigerian Teaching hospital reported 32% of their patients as having delirium using ICD-10. Gonzalez et al on the other hand was a study carried out in Spain among medical inpatients and found prevalence of 35.4% using CAM to diagnose delirium. In addition, a systematic review of some studies conducted in United Kingdom also documented prevalent rates of delirium ranging between 10-31%[7].

However, the prevalence found in this study was considerably higher than the rates found in similar studies conducted inUSA (9%)[8] and Australia (18%)[10].

The high rate of delirium prevalence (35.9%) found in this study is expected. This is because the study was conducted in A&E unit where broad spectrum of illnesses, some of which may be severe and life threatening that may require immediate attention to prevent acute complications such as delirium. This situation was reflected in this study which found that a high proportion of the respondents presented with life threatening illnesses and previous studies have documented a linear relationship between life threatening condition and the development of delirium[14,21].

Furthermore, the considerably higher prevalence of delirium found in this study vis a vis the lower rates recorded in USA and Australia is presumed to occur due to variability in factors such as differences in methodology, cultural factors, as well as respondents' Knowledge, Attitude and Practice (KAP) of diseases and poverty level[22,23]. Some of these factors may have largely contributed to late hospital presentation or presentation only when the condition became severe or after failed traditional/self-medications.

In addition, it is a well-known fact in Nigeria, and perhaps other low income Countries that most hospital and indeed emergency units are traditionally underserved in terms of manpower and facilities amidst large patient's volume. Bookings in the outpatient clinics are often as long as more than 3 to 6 months, this also meant that patients in A&E unit will have to wait a while before been attended to thereby increasing the risk of developing delirium. In support of this, most respondents complained of several hours of waiting before they were finally attended to.

Socio-demographic and Clinical Predictors of Delirium

In this study, the variables that were found to predict delirium among medicalinpatients admitted through A and E unit include: age, estimated monthly income, prior cognitive decline, medical diagnosis and the use of psychoactive substances.

Thus, being aged 18-64 years was found to be predictive of delirium compared to age group 65 years and above. This seems to contradict the findings from several studies which observed higher risk of delirium in the elderly[14,24].The current sample had more of the young and middle aged adults who had more of infectious diseases including HIV with associated wide range of other illnesses not specified in this study compared to the fewer elderly population who may have more of organ failures. This in turn may explain the protective effect of organ failure when compared to other conditions classified under medical diagnosis. This implies that having conditions classified as other medical diagnosis was rather predictive of delirium

compared to having organ failure. So also was not having prior cognitive decline protective of delirium as against those with cognitive decline who by implication had their odds of developing delirium increased by over four times. This finding is consistent with observations by Han et al[25] and Kennedy et al[8] who both found prior cognitive impairment to independently predict delirium at emergency unit. Fong et al[4]in their study, cited from previous research that cognitive decline is associated with decreased cerebral flow and metabolism, cholinergic deficiency and inflammation that may increase the risk of delirium generally.

Similarly, having income of at most N49, 000.00 as against having income of at leastN50, 000.00 was found to be associated with delirium. This is because people with higher income are more likely to go to private hospitals or travel abroad while more severe cases are the ones referred to JUTH. In addition, low income/education and being unemployed/low paid job are indicators of low socioeconomic status with consequent increased morbidity. This is because they are more vulnerable to communicable and infectious diseases such as meningitis, gastroenteritis, malaria etc., yet they do not have the resources to present early in the hospital coupled with malnutrition that further lowers their immunity. Hence, they may likely present with severe form of illness and therefore at risk of developing delirium.

This study also revealed that being abstained as well as alcohol use were predictive of delirium compared to multiple substance use. It has been well established that alcohol withdrawal if not attended to will progress to delirium and the prevalence of delirium among alcohol users have been reported to be variously high[15, 26,].

However, the predictive strength of delirium among the non-users should be interpreted with caution because a disproportionately high percentage of the subjects in this study were non-users, with substantial number of them having delirium.

Conclusion

This study established that delirium is highly prevalent among medical inpatients at A&E and similarly found that variables such as age, estimated monthly income, prior cognitive decline, medical diagnosis and the use of psychoactive substance to be predictive of delirium.The findings are comparable with previous studies and provide more robust evidence of how common delirium is, in a highly chaotic environment like A&E unit.

Recommendation

It is recommended that Screening instrument like CAM, which can be administered in less than 2minutes by the emergency physicians and nurses can be included in normal evaluation and assessment of high risk patients presenting to the A&E unit.

Conflict of Interest: None

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