

# Post Stroke Depression: Experience at Abakaliki Nigeria

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#### Abstract

**Background:** Post stroke depression (PSD) is the most common psychiatric complication following stroke. There has not been any study to demonstrate its burden in Abakaliki, Nigeria. It is against this backdrop that we embarked on this study of the frequency and pattern of PSD in Abakaliki Nigeria. **Me-thod:** This is a cross-sectional observational hospital based study undertaken at the Adult Neurology Outpatient Clinics of Alex Ekwueme Federal University Teaching Hospital Abakaliki, Nigeria from February 2021 to July 2021 (6 months period). **Results:** Amongst the 110 stroke survivors enrolled in the study, 36 (32.7%) had Post Stroke Depression (PSD) with preponderance of mild type. Female gender and young age were associated with the presence of PSD. **Conclusion:** Post stroke depression is prevalent amongst stroke survivors in Abakaliki, Nigeria and more preponderant in women and young individuals.

## **Keywords**

Stroke, Depression, Neurology Clinics, Abakaliki, Nigeria

## **1. Introduction**

Stroke is characterized as a neurological deficit attributed to an acute focal injury of the central nervous system (CNS) by a vascular cause, including cerebral infarction, intracerebral hemorrhage (ICH), and subarachnoid hemorrhage (SAH) [1].

Among stroke survivors, over half have significant physical disabilities and/or psychiatric complications, the most common of which is post-stroke depression

(PSD) [2]. A systematic review and meta-analysis of 51 studies revealed a pooled frequency of PSD as 33% [3]. A hospital based study in Nigeria reported a frequency of 22.9% [4].

Martin Roth was the first to study the association between depression and stroke [5]. Later, Folstein reported that depression was more common in stroke patients than in patients with a similar level of motor disability caused by orthopedic problems [6].

The pathogenesis of PSD is complicated and multi factorial with biological and psychosocial components and may vary depending on timing after event. Several studies suggested that large lesions in critical areas of the brain, post stroke activation of immune system, and hypercortisolism induced by stress or inflammation after stroke, might be the key mechanisms underlying PSD [7].

PSD is considered as the strongest predictor of quality of life (QoL) in stroke survivors and is associated with an increased disability, increased cognitive impairment, increased mortality, both in short and long term, increase risk of falls and, finally, with worse rehabilitation outcome [8]. Conversely, the absence or improvement of PSD is associated with a better functional recovery and ability to return to work [8].

Khedr *et al.* reported that PSD was significantly associated with low educational level, low socioeconomic status, and smoking, while age, gender, residence, marital, and job status were not significantly different between depressed and non-depressed stroke patients though Dong *et al.* reported a higher female preponderance of PSD [2] [9].

There has not been a study of the pattern of PSD at Alex Ekwueme Federal University Teaching Hospital Abakaliki Nigeria despite its strong effect on post stroke functional recovery. It is against this backdrop that we embarked on this study of the frequency and pattern of PSD in Abakaliki Nigeria. The data generated from this study will form the data base for future reference and planning purposes.

#### 2. Methodology

This is a cross-sectional observational hospital based study undertaken at the Adult Neurology Outpatient clinics of Alex Ekwueme Federal University Teaching Hospital Abakaliki, a tertiary hospital in Abakaliki Nigeria from February 2021 to July 2021 (6 months period). The hospital is a referral hub for Ebonyi state, and the surrounding states. The clinics hold on Tuesdays and Thursdays and they are run by teams made up of the consultant neurologist, and resident doctors. The patients seen were mainly subacute and chronic stroke survivors on follow-up visit after discharge from the medical wards, and patients referred from peripheral hospitals. The inclusion criteria were adult stroke survivors who had no premorbid depression, severe speech impairment, dementia or psychiatric disorder. The stroke diagnosis was made with brain Computed Tomography (CT) Scan. The consecutive stroke survivors who came to the stroke clinics over the study period and met the inclusion criteria were enrolled for the study. A structured pretested questionnaire which contained questions on biodata, and clinical information was used to collect demographic and clinical data from the enrolled stroke survivors. Modified Rankin scale (mRS) was used to assess stroke severity while Beck Depression Inventory (BDI) [10] was used to assess for the presence of depression. BDI has been extensively used and validated in Nigeria [11]. The presence of PSD was defined as BDI score of >10 [12] (**Table 1**). The data were analyzed with Statistical Package for the Social Sciences (SPSS) version 25. The categorical variables were presented as proportions and percentages while numerical variables were presented as means and standard deviations. Chi-square was used for test of statistical significance with p-value of <5 as significant.

## 3. Results

One hundred and ten (110) stroke survivors who fulfilled study criteria were seen and recruited for the study over the period of 6 months. Thirty six of them (32.7%) had PSD according to the study protocol. Female gender and young age were statistically associated with the presence of PSD. The other details of the findings are shown in Table 2.

Severity	Score
Normal	1 - 10
Mild Depression	11 - 20
Moderate Depression	21 - 30
Severe Depression	>30

Table 1. Beck depression inventory (BDI).

Table 2. Distribution of post stroke depression.

Variable	Variable	Depression Not Present n (%)	Depression Present n (%)	p-value
Sex	Male	56 (50.9)	7 (6.3)	< 0.05
	Female	18 (16.4)	29 (26.4)	
Age range	18 - 40 years	7 (6.4)	16 (14.5)	< 0.05
	>40 years	67 (60.9)	20 (18.2)	
Type of stroke	Ischemic	54 (58.2)	26 (18.2)	>0.05
	Hemorrhagic	20 (20.0)	10 (3.6)	
Duration after stroke	<6 months	42 (45.5)	21 (13.6)	>0.05
	$\geq$ 6 months	38 (32.7)	15 (8.2)	
Stroke severity (mRS)	0 - 2	46 (49.1)	8 (16.4)	>0.05
	3 - 5	28 (29.1)	28 (5.5)	
Educational level	0 - 6 years	40 (46.4)	26 (15.5)	>0.05
	>6 years	34 (31.8)	10 (6.4)	

#### 4. Discussion

This is the first study on PSD in Abakaliki Nigeria despite its huge negative impact on stroke functional outcome [13]. The reported 32.7% prevalence rate of PSD in this study was high and similar to other hospital based studies in Nigeria and in other sub-Saharan African countries [4] [14]. The high prevalence of PSD is not unexpected as the aetiology is multifactorial and includes the psychological effects of the disease, the effect of stroke on the brain, and the effects of some of the medications [15]. The proposed biological factors contributing to PSD include lesion location, genetic susceptibility, inflammation, neurogenesis in response to ischemia, alterations in neurotrophic factors, disruption of cortico-striato-pallido-thalamic-cortical projections, and alterations in serotonergic, noradrenergic, and dopaminergic pathways, leading to changes in amine levels [16] [17].

The prevalence of PSD was significantly higher in female folks than their male counterparts which is similar to the report from other studies [12] [18]. Various factors, including coagulation status, sex hormones, genetic backgrounds, social interactions, and lifestyle might independently or together help to explain gender differences [19].

Young stroke survivors (<40 years) had statistically significant higher prevalence of PSD than their older counterparts. This is similar to other hospital based studies [12] [20] [21] [22] [23]. This finding could result from the difficulty contending with socioeconomic demands in the family, occupation and general society due to the morbidity caused by the illness [4] [24].

Stroke survivors with Ischemic stroke type had higher prevalence of PSD though not statistically significant. This is similar to the reports from other hospital based studies [25] [26]. Some other studies reported higher prevalence in hemorrhagic stroke [27]. The finding above is not unexpected as the pathophysiology of both types of stroke are similar and also the occurrence of PSD is dependent on the part of the brain affected [16].

The prevalence of PSD was not significantly associated with the duration of stroke. This is similar to the report from a meta-analysis [28]. The above finding is not unexpected as all longitudinal studies of PSD revealed a dynamic natural history, with new cases and recovery of depression occurring over time [29]. The dynamic natural history could be related to the variable outcome of stroke morbidity and also the socio-economic consequences [15].

PSD was preponderantly seen in stroke survivors with severe disability than in those with slight disability, though not statistically significant. This is similar to the report of other studies [30] [31]. This could be due to the pathophysiologic and psychological effects of post stroke disability [15]. Severe disability is also associated with loss of job, social deprivation and more dependence (Table 3).

PSD was predominantly seen in stroke survivors with low educational status. This is similar to the report from other studies [2] [32] [33] [34]. This may be due to defective coping strategies occasioned by poverty, ignorance and less social support seen more in less educated subjects.

Severity	N (%)
No Depression	74 (67.3)
Mild Depression	19 (17.3)
Moderate Depression	10 (9.1)
Severe Depression	7 (6.3)

 Table 3. Pattern of post stroke depression.

## **5.** Conclusion and Recommendations

Poststroke depression is highly prevalent amongst stroke survivors in Abakaliki, Nigeria and it is more preponderant amongst female and young individuals.

There is the need to screen all stroke survivors for PSD, and also the need to incorporate psychotherapy as part of standard protocol for stroke management.

#### **Limitations of the Study**

The study was single centre hospital based cross-sectional study with relatively small sample size. This may affect the strength of the conclusions. A multi-centre collaborative study is recommended to improve the strength of the findings.

## **Conflicts of Interest**

The authors declare that there are no competing or potential conflicts of interest.

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