Scientific Research Publishing

Study of Factor Associated with Post Stroke Depression in the Teaching Hospital of Fann (Dakar-Senegal)

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Abstract

Introduction: Strokes are becoming more common in Africa, they are often accompanied by depressive symptoms, hence the need to investigate the factors associated with it for better management and prevention. **Methodology:** We conducted a prospective cross-sectional study amongst patients hospitalized with stroke at the Neurology/Neuroscience Clinic of the FANN UNHC (Dakar) in 2016. After a clinical diagnosis, patients are subjected to socio-demographic questionnaire and were administered with modified Rankin and MADRS scores. **Results:** Among the patients, 33.7% had Post-Stroke Depression, most were aged 50 to 70 years, male and married. History of stroke and depression was strongly associated with Post-Stroke Depression, while functional or cognitive impairment caused by stroke contributed to the development of Post Stroke depression. The type of ischemic or haemorrhagic stroke did not appear to affect the occurrence of the Post-Stroke Depression, but Post-Stroke Depression was more frequent in subjects with a left hemispheric lesion 47.8% (p < 0.05). **Discussion:** The occurrence of a Post-Stroke Depression is a factor of poor prognosis, early diagnosis and holistic care lead to improved quality of life.

Keywords

Factor, Depression, Stroke, Dakar

1. Introduction

Strokes are becoming more common in our clinical practice in Sub Sahara Afri-

ca [1] [2]. They often lead to physical and cognitive impairments and deficits, which are often accompanied by emotional disturbances and symptoms of depression [3]. Depression is a common and serious complication after stroke. According to epidemiological studies, nearly 30% of stroke patients develop depression, either in the early or in the late stages after stroke [4] [5].

Although depression may affect functional recovery and quality of life after stroke, such condition is often ignored [2]. In fact, only a minority of patients are diagnosed and even fewer are treated in the common clinical practice [6]. In particular, depression is considered as the strongest predictor of quality of life in stroke survivors, it is associated with an increased disability, increased cognitive impairment, increased mortality, both on short and long term, increase risk of falls and with worse rehabilitation outcome [2] [7]. So far, there has been no effective preventive intervention for post-stroke depression. We, however, found it necessary to study post-stroke depression to determine the patient profile and explore preventive strategy.

2. Objectives

The overall objective of our study was to determine the epidemiological profile of patients hospitalized for stroke at the Ibrahima Pierre Ndiaye Neurological/Neurosciences Clinic of National University Hospital Centre (CHNU) during the period from January 1, 2016 to December 31, 2016.

The specific objectives were to:

- Describe the socio-demographic characteristics of patients with Post-stroke depression hospitalized at the Neurological/Neurosciences I P Ndiaye Clinic of the CHNU de Fann during the period January 1, 2016 to December 31, 2016.
- Estimate the frequency of Post-stroke depression in patients hospitalized at the Neurological/Neurosciences I P Ndiaye Clinic of the CHNU de Fann during the period from January 1, 2016 to December 31, 2016.
- Estimate the frequency of motor deficits in patients hospitalized during the outflow of a stroke at the Neurological/Neurosciences I P Ndiaye Clinic of the CHNU de Fann during the period from January 1, 2016 to December 31, 2016.

3. Material and Methods

3.1. Study Framework

We conducted a study at the Neurology/Neurosciences Ibrahima PierreNdiaye Clinic of National University Hospital Centre (CHNU) of FANN in Dakar/Senegal. The CHNU de Fann is a level three public health institution.

3.2. Type of Study

It was a descriptive, prospective and quantitative study over a period of twelve (12) months from January 1, to December 31, 2016.

3.3. Population Study

The study involved stroke patients during 2016 and admitted in the hospital at the Neurology/Neurosciences Ibrahima Pierre Ndiaye Clinic of National University Hospital Centre (CHNU) of FANN.

3.4. Inclusion Criteria

We included patients in our study the stroke victims confirmed by a brain scan in 2016 and hospitalized in the unit; who can be reached by telephone and/or able to travel (to return to the hospital), and be agreed to participate in the study.

3.5. Exclusion Criteria

We did not include patients with co-morbidities such as dementia or psychiatric disorders other than depression; with alertness disorders; undergoing neuroleptic treatments because of the probable psychomotor slowdown due to their sedative effect, and these who have been in the hospital for less than seven days.

3.6. Data Collection

We received all patients referred by the external consultation of the CHNU of Fann for hospitalization in the same department in which the stroke diagnosis is made. We subjected them to an investigator-administered questionnaire at admission during personal interview, and/or in the presence of their caregiver. The questionnaire explored socio-demographic, clinical and evolutionary information. Stroke was diagnosed using the clinical examination and brain scan results. Whereas, the diagnosis of depression was made according to the criteria of DSM V. The latter covers the different items of depression: mood, psycho-cognitive disorders, sleep and appetite disorders, psychomotor slowdown and somatic disorders.

The clinical evaluation was conducted using a variety of tools. Patients' functional status was assessed using the modified Rankin scale; it was used to measure the degree of disability or dependence in the daily activities of people who have had a stroke or other causes of motor neurological disability. In our study we considered any patient with a Rankin score higher than 3 (a judgment criterion very often used in neurovascular therapeutic studies) as having disability. The severity of depression was assessed using the MADRS scale, the scale is an investigator administered 10-item questionnaire used to assess the severity of depression in patients with mood disorders. The score not only confirms the diagnosis of depression but also determine its severity. The score can range from 0 to 60. We selected patients that had a score above 20; this corresponds to moderate to severe depression.

3.7. Data Entry and Analysis

Data analysis was performed using Sphinx plus software version 5.1.05 and Epi

info 7. We carried out a descriptive and bi-varied analysis, with dependent and independent variables. The results are expressed with a risk of error α equal 5%.

4. Results

4.1. Description of Patients

The average age of our study population was 58.5 (±13.7) years. The median age was 60 years with extremes ranging from 30 to 84 years. In a study population of 98 stroke patients, 33 patients (33.67%) were diagnosed with depression. Among patients who showed signs of depression on clinical examination, the MADRS found that severe depression was present at 3.03 %. The light depression was found in 63.64% of the patients (see Figure 1).

4.2. Analysis of Depression by the Characteristic of Patients

The prevalence of depression was 32.56% among females and 34.55% among males. Active patients were more likely depressed 39.22% than non-active patients 27.66%. This difference was not statistically significant. In the same line, depression was more found in married patients 38.71% compared to single one. But this difference was not statistically significant.

Patients with history of stroke were depressed in 42.86%. Depression was found in patients with diabetes in 22.22% compare to non-diabetes ones in 36.25%. This difference was not statistically significant. The frequency of depression was 27.94% in hypertensive individuals and 46.67% in non-hypertensive individuals. This difference was not statistically significant. In the field of history of psychiatry disorders, we found 55.56% cases of depression.

According to our results, patients with aphasia were depressed in 42.86% and 21.43% in non-aphasic patients. This difference was statistically significant with a p-value equal to 0.02. Patients with aphasia were 2.75 times more likely to be depressed IC = [1.10 - 6.81]. The prevalence of depression was 31.82% in subjects
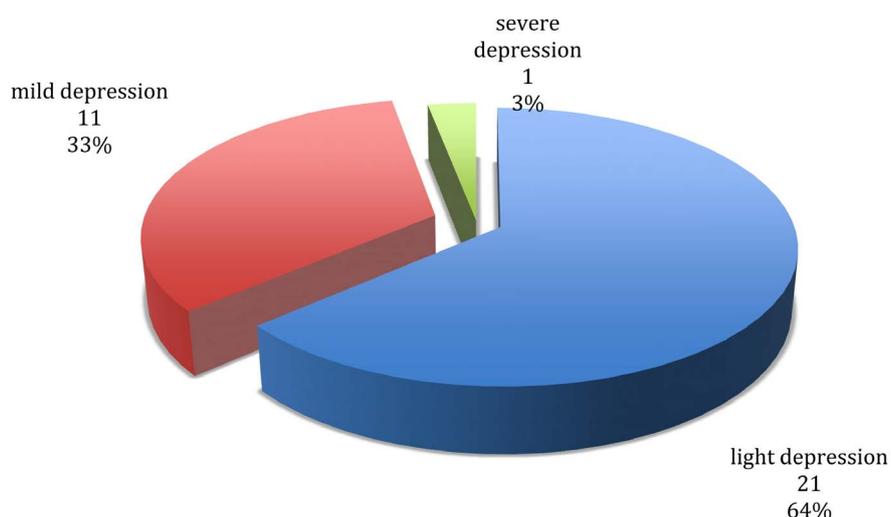

Figure 1. Distribution of patients according to the severity of depression (N = 33).

with haemorrhagic stroke and 34.21% in subjects with ischemic stroke. This difference was not statistically significant (p = 0.83). About the location, depression was found in 47.83% of patients with left hemispheric lesions and 22% in patients with right hemispheric lesions. This difference was statistically significant with p-value equal to 0.008. Left hemispheric impairments were 3.25 times more likely to be depressed than right hemispheric impairments IC = [1.34 - 7.87].

The accuracy of depression was 32.61% among individuals who had had functional rehabilitation and 40% among individuals who had not. This difference was not statistically significant.

The prevalence of depression was 75.76% in patients considered to have disability (Rankin > 3) and 24.24% in autonomous patients (Rankin ≤ 3). This difference was statistically significant (p-value = 0.04). Patients with post-stroke disability were 2.56 times more likely to be depressed IC = [1.34 - 7.87].

Among patients with depression 39% or 13 patients died, 36% lost eye sight (12 patients). A favourable evolution under treatment is reported in six patients, representing 18% of cases. While in two patients (7% of cases), we noted a persistence of depressive symptoms. Table 1 shows all the factors associated with depression among the patients with stroke.

Table 1. Associated factor of depression among stroke patient.

Variables		Depression n (%)		TOTAL N (%)	P
		Yes	No		
Gender	Female	14 (32.56)	29 (67.44)	43 (43.88)	0.83
	Male	19 (34.55)	36 (65.45)	55 (56.12)	
Employment	Active	20 (39.22)	31 (60.78)	51 (52.04)	0.25
	Non Active	13 (27.66)	34 (72.34)	47 (47.96)	
Matrital Statut	Married	24 (38.71)	38 (61.29)	62 (63.27)	0.16
	Non married	9 (25.00)	27 (75.00)	36 (36.73)	
Family Assistance	Yes	31 (33.70)	61 (66.30)	92 (93.87)	0.49
	No	2 (33.33)	4 (66.67)	6 (6.13)	
School Enrolment	Yes	20 (35.09)	37 (64.91)	57 (58.16)	0.72
	No	13 (31.71)	28 (68.29)	41 (41.84)	
Stroke History	Yes	6 (42.86)	8 (57.14)	14 (14.29)	0.61
	No	27 (32.14)	57 (67.86)	84 (85.71)	
Diabetes History	Yes	4 (22.22)	14 (77.78)	18 (18.37)	0.39
	No	29 (36.25)	51 (63.75)	80 (81.63)	
History of Hypertension	Yes	19 (27.94)	49 (72.06)	68 (69.39)	0.07
	No	14 (46.67)	16 (53.33)	30 (30.61)	
History of Psychiatric Disorders	Yes	5 (55.56)	4 (44.44)	9 (9.18)	0.27
	No	28 (31.46)	61 (68.54)	89 (90.82)	

Continued

Aphasia	Yes	24 (42.86)	32 (57.14)	56 (57.14)	0.02
	No	9 (21.43)	33 (78.57)	42 (42.86)	
Stroke Type	Haemorrhagic	7 (31.82)	15 (68.18)	22 (22.45)	0.83
	Ischemic	26 (34.21)	50 (65.79)	76 (77.55)	
Stroke Territory	Left	22 (66.67)	25 (38.46)	47 (47.96)	0.008
	Right	11 (33.33)	40 (61.54)	51 (52.04)	
Rankin Modified	Autonomous	8 (21.62)	29 (78.38)	37 (37.76)	0.004
	Invalid	25 (40.98)	36 (59.02)	61 (62.24)	
Rehabilitation	Yes	31 (32.61)	62 (67.39)	93 (94.90)	0.99
	No	2 (40.00)	3 (60.00)	5 (5.10)	
Anti HTA Treatment	Yes	21 (28.77)	52 (71.23)	73 (74.49)	0.07
	No	12 (48.00)	13 (52.00)	25 (25.51)	

5. Discussion

In our study, the frequency of the post-stroke depression was 33.67%. This is close to the 38% reported in the literature [6]. Although some variation has been reported by region and study, this can range from 18% to 60% depending on the studies [7] [8] [9], however, two studies in Germany reported a higher frequency of 72.3% [10] [11]. These large differences can be explained by the variability of the methods used, higher reported frequency of depression in the European countries could also explain the difference [12].

According to our results, the post-stroke depression was more frequent in subjects aged 50 to 70 years, male and married, please note that, life expectancy in the general population in Senegal is 64.8% [1]. Data found in literature also points in the same direction for age [9] [13] [14] [15], marital status [16] [17] and gender [9] [18] [19]. It's also important to notice that in our study, the prevalence of post-stroke depression is higher among active patients (39.2%) compared to non-active subjects (27.66%), this is however not of statistical significance. Stroke in this context translates into a loss of physical autonomy and financial resources for both the subject and his or her family. Often, the one who has hitherto been providing for the family often becomes a family financial burden. In a context of limited economic resources associated with a lack of medical coverage; it is easy to understand that the occurrence of stroke can impact the quality of marital, family and even social relationships [20]. Therefore, very often, among these active subjects, there is also the question of returning to the premorbid job or professional reorientation in relation to the deficit caused by stroke. In the same way, the medical history of the patient seems to be important to consider. Patients with a medical history of diabetes (22.2%) or hypertension (27.9%) have a lower incidence of Post-stroke depression compare to these without the same history. The chronic nature of these conditions, combined with the work of raising awareness of possible complications, may lead to greater

patient compliance and in the event of a stroke, lesser complication and better resilience. This experience may be quite the opposite in subjects with no such long-standing history of diabetes and/or hypertension. In contrast, according to some authors [21] [22], a history of stroke (before the actual incident) may be strongly associated with the onset of a Post-stroke depression. The same applies to a history of psychiatric disorders, particularly depression. These are a risk factor for the development of Post-stroke depression [5] [23] [24] [25]. In our study, the prevalence of depression was 55.6% among individuals with history of psychiatric disorder and 31.5% among individuals who did not have.

From a clinical point of view, stroke is determined by three major factors: the deficit caused the type of stroke and its location. In this study, aphasia was the most frequently encountered symptom (57.1%); we found statistically significant high post-stroke depression (42.9%) among aphasic subjects compared to 21.4% non-aphasic subjects (p < 0.05). This finding is similar to those reported in European countries [3] [21]. Language disorders correlate with the loss of the symbolic ability [26], impacting the relationship with the others and particularly among couples [27].

Several studies have shown the link between functional disability and the occurrence of Post-stroke depression [2] [28] [29] [30]. We also observed this relationship in our study where depression was 75.8% (p = 0.04) more frequent among patients who were unable to walk alone and/or support themselves. According to Carota *et al.* [31], the intensity of depressive symptoms strongly correlates with the degree of functional disability. Thus, the presence of motor, perceptual or cognitive disability leads to devastating effects on sense of autonomy. Therefore, the resulting feelings of frustration could be a major aetiological factor in depression after a stroke.

In this study, the type of stroke does not appear to affect the occurrence of Post-stroke depression. The prevalence of Post-stroke depression was slightly higher in patients with ischemic stroke (34.2%) than in patients with haemorrhagic stroke (31.8%) without statistically significant difference. This is similar to the findings in larger proportions reported by Seetlani [9].

We found that patients with right cerebral hemisphere lesions were 52.1% of the population. However, Post-stroke depression was more common among those with a left hemispheric lesion 47.8% compared to right hemispherical lesions with 22%, this difference is statistically significant with a p = 0.08. This finding is similar to those frequently reported in the literature [14] [31] [32] [33]. It is further supported by the valence hypothesis where she argues that, under physiological conditions, the left hemisphere is specialized in controlling positive emotions and the right hemisphere in controlling negative emotions. In case of dysfunction of the left hemisphere, there is a dominance of negative emotions of the right hemisphere, thus explaining the depressive symptoms. However, there are other authors who report association of post-stroke depression more with right hemispheric lesions [34] [35] and therefore, this debate is not yet settled.

In treatment aspects Post-stroke depression was more frequent among subjects who did not receive functional rehabilitation (40%) as compared to those who received functional rehabilitation (32.6%), however, this difference is not statistically significant (p = 0.99). According to some authors, the beneficial effect of rehabilitation on motor skills and therefore independence can have an impact against post-stroke depression [2] [36]. However, it is important to consider the irregularity of rehabilitation sessions in the Senegalese context, which is doubly justified by the lack of physiotherapists and the high cost of sessions by Senegal standard, between 4000 and 10,000 francs ($8 to $20). According to Capron *et al.* [37], depression can be seen as a deficit phenomenon with a decrease in psychomotor functioning and a disinvestment in rehabilitation work. On the other hand, it can also be seen as an active phenomenon. The principle of cognitive-motor interference considers depression as a cognitive task in its own right, which can be responsible for a monopolization of attention and executive resources through fixed ideas and depressive ruminations, competing with rehabilitation work in a dual-task model.

There are few studies on the evolution of the post-stroke depression [8], though generally the its' occurrence should be considered a poor prognostic factor. Studies have shown that post-stroke depression increases mortality by 3.5 folds among stroke patients compared to those without depression [38]. In addition, post-stroke depression increases the length of recovery time and the burden of sequelae, as such quality of life remains significantly reduced as caregivers are also over burdened [39].

In our study, we found that the progression during treatment is marked by a clear regression in depressive symptomatology with a decrease in the MADRS score in most patients at 3 months and 6 months, we found that 18% of the patients progressed well both psychologically and functionally. This highlights the need for psychological support for all patients and antidepressant treatment if necessary for some. From this perspective, selective serotonin reuptake inhibitors (SSRIs) have been shown to fewer side effects [22] [40] [41].

The majority of our study population benefited from family support, we, however, found that the frequency of depression was slightly higher among patients who did not receive family support. Though we are tempted to opine that family support should be seen as a factor of resilience, we cannot categorical make this conclusion due to the limitation of this study.

Educational level does not seem to have an impact on the occurrence of depression, but it could play a fundamental role in the follow-up of post-stroke patients. Indeed, our study population had 40.8% out-of-school subjects, which is in line with the national prevalence of 45.4% [1].

6. Conclusion

Stroke is longer uncommon in Africa and constitutes a public health problem whose prognosis is clouded by the occurrence of post-stroke depression. Post-stroke

depression has long been under-diagnosed; it is now necessary to pay more attention to the mental state of patients with stroke. Without drawing hasty conclusions, we think that the existence of certain clinical elements should make fear of the occurrence of post-stroke depression. Among these, we can note the right location of the stroke, aphasia and a loss of autonomy. Early diagnosis of post-stroke depression associated with holistic care may improve patients' quality of life.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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