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Functional Prognosis and Professional Reintegration at 3 Months of Young Patients Victims of a First Episode of Stroke in 2024 in Congo

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Abstract

Introduction: Strokes are a major cause of disability. In working-age individuals, this disability has socioeconomic, occupational, and psychological consequences that can lead to depression and difficulty returning to work, especially in younger individuals. **Objective:** To identify factors associated with functional recovery and professional reintegration 3 months post-stroke. **Methodology:** This was a multicenter, cross-sectional study conducted in Brazzaville and Pointe-Noire over a period of 8 months. Patients aged 18 to 55 years, hospitalized for a first stroke confirmed by brain imaging, were included. The study variables included sociodemographics, clinical characteristics, and progression (functional rehabilitation, motor disability, and recovery time during follow-up, return to work, and time to return to work after stroke). Statistical analyses were performed using SPSS 27 software. **Results:** The mean age of patients was 46.8 ± 6.9 years, with a male predominance (53%). The mean Rankin score was 2 ± 1. One hundred and thirty-two patients had a disability, including 57 (43.2%) in Brazzaville and 75 (56.8%) in Pointe-Noire. The mean time to initiation of functional rehabilitation was 3 days ± 1.8. One hundred and eight (81.8%) patients received functional rehabilitation. Factors associated with functional recovery were: mild-moderate Rankin score (OR = 3; p < 0.038), functional rehabilitation (OR = 5.5; p < 0.001). Those associated with professional reintegration: being employed (OR = 2.1; p = 0.032); Moderate disability (OR = 2.2; p = 0.021); start of rehabilitation <

5 days (OR = 10; p = 0.024). **Conclusion:** It is important to encourage and refer patients early to rehabilitation centers to ensure good functional recovery and facilitate professional integration.

Keywords

Functional Prognosis, Professional Reintegration, Young Subject, Stroke, Congo

1. Introduction

Stroke is a neurovascular emergency, they are responsible for 5.7 million deaths according to the World Health Organization (WHO) [1]. They are the third leading cause of mortality after cancers and ischemic heart disease and the leading cause of acquired disability in adults [2] [3]. It is recognized that strokes are a major cause of disability. Due to the resulting limitations in activities such as walking, language and social participation [4] [5]. In working-age subjects, this disability has socioeconomic, professional and psychological consequences that can lead to depression [6]-[8]. In Congo, although the socio-professional reintegration of stroke patients is possible, it remains very limited [9], due to the absence of dedicated support programs to help adapt workstations according to the disability presented by the patients. The aim of this work was to identify factors contributing to functional recovery and professional reintegration 3 months post-stroke.

2. Patients and Methods

This was a longitudinal analytical study, running from March 1st to October 31st, 2024, a period of 8 months, conducted in the neurology departments and the neurovascular care unit of the CHUB in Brazzaville, as well as the neurology, multidisciplinary intensive care, and emergency departments of the Loandjili and Adolphe Cisé general hospitals in Pointe-Noire.

All patients aged 18 to 55 years, hospitalized in these departments and suffering a first stroke confirmed by brain imaging, were included. Patients with a preexisting disability secondary to a non-neurological or neurological condition other than stroke were excluded from the study. The variables studied were: sociodemographic (age, sex, marital status, professional category, educational level and socioeconomic level); clinical characteristics of the stroke (reason for admission and time to admission, state of consciousness at admission: Glasgow Coma Scale (GCS), blood pressure, type of neurological deficit, severity of the stroke according to the NIHSS score, use of a physiotherapist, motor disability at discharge (Rankin score)); progressive (complications, time to initiation, motor disability and recovery time during follow-up, return to work and time to return to work after stroke).

The modified Rankin score was used to assess the disability of patients with

disabilities, it is rated from 0 - 5: no disability (0 - 1), mild to moderate disability (2 - 3), severe disability (4 - 5).

Early rehabilitation was carried out in the physiotherapy department of the hospitals mentioned. It was performed at a frequency of 3 sessions per day during the acute phase of hospitalization and daily upon discharge.

For patients with mild to moderate disability (Rankin score 2 - 3):

- Muscle strengthening;
- Early mobilization;
- Mirror therapy;
- Constraint-induced mobilization;
- Exercise retraining.

For patients with severe disability (Rankin score 4 - 5):

- Improve transfers;
- Sitting and standing postural balance;
- Early mobilization;
- Sit-stand/stand-sit transition work;
- Adapted physical work;
- Walking work.

A flat sort of the database was performed. The qualitative variables were presented in tables containing the absolute and relative counts. For quantitative variables, the trend (mean, median) and dispersion (standard deviation) parameters were calculated. Comparisons of proportions were made using Pearson's Chi-square test or Fisher's exact test when the conditions for applying the Pearson test were not met. The Chi-square test was applicable when the theoretical numbers were greater than 5. To identify factors associated with mortality, recovery and socio-professional reintegration, two types of analyses were performed:

- a univariate analysis where the variable of interest was crossed with the explanatory variables (sociodemographic, clinical, evolutionary). The crude hazard ratios (HR) were estimated with 95% confidence intervals;
- Following the univariate analysis, a multivariate analysis was performed, including all variables with p-values less than or equal to 20% during the univariate analysis.

Interpretation of hazard ratios/odds ratios:

- OR/HR > 1, the association is a risk factor;
- OR/HR < 1, the association is a protective factor;
- OR/HR = 1, there is no association between the exposure and the event.

The significance threshold was set at 5%.

Data were entered into Kobotoolbox. Data processing was performed in Excel 2019. Statistical analyses were performed using SPSS 27 software

3. Results

During the study period, 553 patients were hospitalized for stroke, including 290 in Brazzaville and 263 in Pointe-Noire. Among the 553 patients, 232 met the in-

clusion criteria, giving a hospital frequency of stroke in young people of 42% for both cities. The hospital frequency in Brazzaville was 34.8% and in Pointe-Noire 49.8%, including 92 with an ischemic stroke (39.6%) and 104 with a hemorrhagic stroke (60.4%).

The mean age of the patients was 46.8 ± 6.9 years with extremes of 26 - 55 years. There were 123 (53%) men and 109 (47%) women, *i.e.* a *sex ratio* of 1.1.

The distribution of patients according to marital status and professional category is presented in Table 1. Table 2 shows the distribution of patients according to educational and socioeconomic level.

Table 1. Distribution of patients according to marital status and professional category.

	Effective	Percentage
Marital status		
Married/in a relationship	138	59.5
Bachelor	73	31.5
Divorce	19	8.1
Widower (ve)	2	0.9
Category professional		
Worker independent	112	48.3
Employee	91	39.2
Unemployed	29	12.5

Table 2. Distribution of patients according to educational and socioeconomic level

	Effective	Percentage
Level instruction		
Secondary	111	47.8
Primary	81	34.9
Superior	39	16.9
Illiterate	1	0.4
Level socioeconomic		
Average	129	55.6
Down	83	35.8
Good	20	8.6

Among the 232 patients, two (0.9%) patients had neither motor nor language disorders.

One hundred and thirty-three patients had hemiplegia (57.9%), 96 had hemiparesis (41.7%), 9 had dysarthria (39.1%), 80 had aphasia (38%).

At arrival, thirty-seven patients had a major stroke (15.9%), 73 a severe stroke

(31.5%), 97 a moderate stroke (41.8%), 25 a minor stroke (10.8%).

3.1. Functional Prognosis and Functional Rehabilitation

Rankin score was 2 ± 1.

The mean time to initiation of functional rehabilitation was 3 days ± 1.8 with extremes ranging from 1 - 10 (Figure 1). Among the 163 survivors, 132 patients had a disability of which 57 (43.2%) in Brazzaville and 75 (56.8%) in Pointe-Noire. Functional rehabilitation was performed by 108 (81.8%) patients versus 24 (18.2%). The recovery rate in the two cities was 60.6% (80/132), including 35 in Brazzaville (61.4%) and 45 in Pointe-Noire (60%). Table 3 shows the comparisons

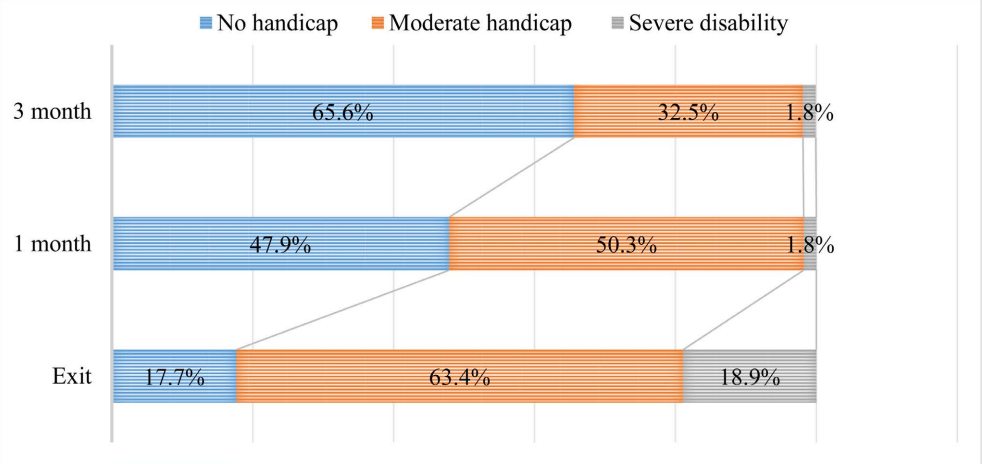

Figure 1. Rankin score at discharge, 1 and 3 months.

Table 3. Comparison between Rankin score, stroke type, rehabilitation and delay initiation

	Functional recovery		p-value
	Yes n (%)	No n (%)	
Rankin			
Mild-moderate disability	70 (63.6)	33 (64.2)	**<0.038**
Severe disability	10 (9.1)	19 (35.8)	
Stroke type			
Ischemic stroke	27 (33.8)	30 (57.7)	
Hemorrhagic stroke	53 (66.2)	22 (42.3)	**0.020**
Functional rehabilitation			
Yes	80 (100)	28 (53.8)	**<0.001**
No	-	24 (46.2)	
Rehabilitation initiation time			
≤5 days	77 (96.3)	11 (39.3)	**<0.001**
>5 days	3 (3.7)	17 (60.7)	

between Rankin score, stroke type, functional rehabilitation and initiation time. And Table 4, the factors associated with functional recovery.

Table 4. Factors associated with functional recovery.

	Functional recovery		p-value	HR IC
	Yes n (%)	No n (%)		
Rankin				
Mild-moderate disability	70 (63.6)	33 (64.2)	**<0.038**	3 [1.5 - 5.6]
Severe disability	10 (9.1)	19 (35.8)		1
Functional rehabilitation				
Yes	80 (100)	28 (53.8)	**<0.001**	5.5 [3.2 - 9.4]
No	-	24 (46.2)		1

3.2. Professional Reintegration

At the end of the study, 144 patients were alive and previously employed, including 60 (41.7%) in Brazzaville and 84 (58.3%) in Pointe-Noire.

The professional reintegration rate was 66.7% (n = 96), including 40 in Brazzaville (66.7%) and 56 in Pointe-Noire (66.7%).

Univariate analysis of factors potentially associated with professional reintegration is presented in Table 5 and Table 6. The factors associated with professional reintegration in the multivariate analysis are presented in Table 7.

Table 5. Correlation between sociodemographic variables and professional reintegration.

	Professional reintegration		p-value	HR IC
	Yes n (%)	No n (%)		
Age				
26 - 35	6 (6.3)	5 (10.4)	0.477	1.3 [0.5 - 3.3]
]35 - 45]	27 (28.1)	11 (22.9)	0.471	1.3 [0.5 - 3.1]
]45 - 55]	63 (65.6)	32 (66.7)	0.759	1
Sex				
Male	55 (57.3)	26 (54.2)	0.891	1 [0.6 - 1.4]
Female	41 (42.7)	22 (45.8)		1
Professional category				
*Employee	51 (53.1)	17 (35.4)	**0.059**	2 [1 - 3]
**Self-employed	45 (46.9)	31 (64.6)		1
Socioeconomic level				
Down	17 (17.7)	27 (48.9)		1
AVERAGE	65 (67.7)	21 (46.7)	**<0.001**	3.1 [1.8 - 5.4]
Good	14 (14.6)	-	**<0.001**	4 [2 - 8.2]

*Employee: an agent of a public or private institution or company. **Self-employed: someone who works on their own account.

Table 6. Correlation between Rankin score, functional rehabilitation and initiation time.

	Professional reintegration		p-value
	Yes n (%)	No n (%)	
Rankin			
No handicap	28 (29.2)	1 (2.1)	**<0.001**
Mild-moderate disability	58 (60.4)	31 (64.6)	**0.021**
Severe disability	10 (10.4)	16 (33.3)	
Rehabilitation			
Yes	67 (98.5)	27 (57.5)	**<0.001**
No	1 (1.5)	20 (42.5)	
Start of rehabilitation			
≤5 days	66 (98.8)	10 (55.8)	**<0.001**
>5 days	1 (1.2)	17 (44.2)	

Table 7. Factors associated with professional reintegration

	Professional reintegration		p-value	HR IC
	Yes n (%)	No n (%)		
Professional category				
*Employee	51 (53.1)	17 (35.4)	**0.032**	2.1 [1 - 4.5]
**Self-employed	45 (46.9)	31 (64.6)		1
Rankin				
No handicap	28 (29.2)	1 (2.1)	**0.001**	5.4 [2.6 - 11.2]
Moderate disability	58 (60.4)	31 (64.6)	**0.021**	2.2 [1.1 - 4.3]
Severe disability	10 (10.4)	16 (33.3)		1
Start of rehabilitation				
≤5 days	66 (98.8)	10 (55.8)	**0.024**	10 [1.3 - 13.4]
>5 days	1 (1.2)	17 (44.2)		1

*Employee: an agent of a public or private institution or company. **Self-employed: someone who works on their own account.

4. Discussion

4.1. Frequency of Strokes in Young People

The hospitalized stroke frequency in young people in Brazzaville and Pointe-Noire was 42%. In Abidjan in 2024, Sai *et al.* [10] observed a similar frequency, estimated at 46%. However, Mapouré *et al.*, and Sounga Bandzouzi *et al.,* [11] [12] reported a significantly lower frequency, 15.26% and 12.1%, respectively. This difference could reflect a trend toward increasing stroke frequency in young people in sub-Saharan Africa.

Brazzaville, the capital of Congo, is an administrative city where the majority of employees are civil servants, as evidenced by the higher number of employees in Brazzaville in our study population. However, in Pointe-Noire, a coastal city and the economic capital of Congo, jobs are primarily filled by private companies, with a high incidence of subcontracting, indicating the precarious nature of this type of employment and difficulties in accessing employment. Thus, the majority of patients predict greater societal stress in Pointe-Noire than in Brazzaville, influencing access to functional rehabilitation and professional reintegration.

4.2. Functional Prognosis and Factors Associated with Recovery

At the end of the follow-up, the recovery rate observed in our study was 60.6%. This recovery rate was similar between Brazzaville (61.4%) and Pointe-Noire (60%). The factors associated with recovery were a Rankin score ≤ 3 and the completion of functional rehabilitation. A low Rankin score has been reported as a factor associated with recovery in several studies [13] [14]. These results also highlight the importance of functional rehabilitation in the recovery process. In sub-Saharan Africa, although patients and their families prefer to resort to traditional treatments, some have become aware of the importance of functional rehabilitation.

4.3. Professional Reintegration and Factors Associated with Reintegration

Return to work concerned 66.7% of survivors at 3 months, with no difference between Brazzaville and Pointe-Noire. Similar results were reported by Bonner *et al.* as well as Peters *et al.,* [15]-[17] where more than half of the patients returned to work. Indeed, professional reintegration after a stroke is generally observed between 3 and 6 months when rehabilitation is well conducted [18] [19]. However, Boubayi *et al.* reported a much lower return to work rate of 17.85% in 2022 in Congo [8].

The factors associated with professional reintegration in our study were being an employee, a low Rankin score, early initiation of functional rehabilitation. The same factors have been found by several authors [2] [15] [17] [20] [21]. The factors positively related to return to work in stroke patients, as they appear in the literature, are age less than 65 years, male gender and white collar [22]. The factors that negatively influence return to work found are advanced age, female gender, diabetes, as well as the initial severity of functional signs [23] [24].

5. Conclusion

The rate of recovery and professional reintegration was high in Congo. Factors associated with recovery were a low Rankin score and the achievement of early functional rehabilitation. This provides useful information to encourage and refer patients very quickly to the appropriate rehabilitation centers in order to allow good functional recovery and facilitate professional integration.

Conflicts of Interest

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

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