Functional rehabilitation of hemiplegic patients following a stroke at the Yaoundé General Hospital

Abstract

According to the World Health Organization (WHO), stroke is a rapid development of localized or global clinical signs of central nervous system dysfunction or deficit of vascular origin, lasting more than 24 hours. Our work focuses on the description of rehabilitation protocols for patients for a better socio-professional integration. The general objective of this work was to describe the different rehabilitation techniques and to evaluate the response to the rehabilitation of disabled post-stroke patients at the Yaoundé General Hospital. We worked with 07 male patients. Two main techniques were used: Bobath and exercise training. We assessed 4 parameters in each patient: muscle strength, walking ability, degree of disability and autonomy. At the end of the study, the patients had an improvement in their health status compared to the beginning of their physiotherapy treatment. The assessment of muscle strength of the upper limb showed that 28.6% on arrival were rated at 1/5, 28.6% at 2/5 and 28.6% at 3/5 and that of the lower limb showed that 28.6% were rated at 1/5, 14.2% at 2/5 and 28.6% at 3/5. At the end of the stay, the results of the muscle strength of the upper limb show that: 0% had 1/5; 33.3% had 2/5; 33.3% had 3/5. For the lower limb, 57.1% had 3/5 and 42.9% had 4/5. The assessment of walking ability showed 42.9% in class 0 and 14.3% in class 6 at the beginning of the care; at the end of the stay, 33.3% were in class 6 and 16.7% in class 7. The evaluation of autonomy shows that at the beginning of the stay, 14.2% of patients had a Barthel score lower than 25/100 and 42.9% had a Barthel score higher than 75/100. At the end of the stay, 16.7% had a Barthel score between 25 and 50/100 and 66.6% were over 75/100. The evaluation of the degree of disability shows that 14.3% had a severe disability and 14.3% no disability, 33.3% had no disability and 16.7% had a moderate disability.

In conclusion, physical therapy in post-stroke hemiplegics allows improvement and recovery of motor deficits with Bobath techniques and exercise training.

Key words: Stroke, functional rehabilitation.

Introduction

CONTEXT AND RATIONALE :

According to the World Health Organisation (WHO) definition, stroke is a rapid development of localised or global clinical signs of central nervous system dysfunction of vascular origin, lasting more than 24 hours, unless interrupted by surgery or death, when no other non-vascular cause is apparent (1). This is a common and serious condition. According to the WHO, cardiovascular disease is the leading cause of death in the world. Nearly 17.1 million deaths are attributable to cardiovascular disease, which represents 29% of total mortality. Of these deaths, an estimated 7.2 million are due to coronary heart disease and 5.7 million to stroke. More than 82% of deaths occur in middle- and low-income countries and affect both men and women(2). Stroke is responsible for an extremely high rate of disability and handicap today and is a major public health problem. Stroke management must be rapid and effective in order to reduce mortality and disability(3). At the same time as the patient is medically managed, he or she must also benefit from paramedical care, particularly physiotherapy(4). Numerous studies have shown the effectiveness of rehabilitation in both the acute and chronic phases of the disease. Physiotherapists with experience in practice have a subjective way to evaluate and follow the patient during their rehabilitation.

The aim of our study is to evaluate physiotherapy management techniques for post-stroke hemiplegic patients.

The general objective is to identify the different rehabilitation techniques that exist, to evaluate the physiotherapy management practiced at the Yaoundé General Hospital.

The specific objectives are:

- Describe the physiotherapy management practiced at all stages of the disease;
- Identify the different rehabilitation techniques used in the physiotherapy department.

- Evaluates the progress of each patient followed by physiotherapy

Materials and **Methods**

It is an analytical, prospective and interventional study conducted within the Physiotherapy unit of the Yaounde General Hospital. It lasted 3 months from March 3 to June 30, 2015 and involved 7 patients selected out of 35 hemiplegic patients received during the study period, aged between 50 and 75 years, i.e. an average age of 67 years, all of them male.

Patients admitted to the physiotherapy department after a stroke with motor deficits, aged at least 30 years, who have been followed for at least two months for rehabilitation in the physiotherapy department and who have agreed to participate in the present study after verbal informed consent according to the Declaration of Helsinki II, are included in the study.

Excluded from the study were hemiplegic patients from the Yaounde General Hospital not followed up in the physiotherapy department with hemiplegia of other origin than stroke, post-stroke hemiplegic patients with a duration of physical treatment inferior to 2 months or less than 30 years old and hemiplegic patients who refused to participate in the present study;

Patients are examined and the following indicators are collected: demographic data (identity, sex and age), anthropometric data (body weight and height), gait assessment (Functional ambulation classification modified), muscle strength assessment: *Held and Pierrot - Desseilligny scoring* (assessment of motor control in the hemiplegic), assessment of autonomy (BARTHEL scale) and assessment of disability (modified RANKIN scale);

Patients are removed from their shoes and stood on a SECA scale. The weight is expressed in kilograms. The height is taken at the same time thanks to the ruler directly mounted on this scale. It is expressed in metres.

Assessment of muscle strength, the *Held and Pierrot Desseilligny score* can be used in stroke assessment to assess muscle strength, which is scored from 0 to 5. The patient is in the supine position. It assesses the patient's ability to overcome gravity and the resistance is done manually.(5)

Gait assessment: The scale used for this step is the functional ambulation classification modified (FAC modified). This scale determines whether or not the patient is able to walk, whether or not they can cross obstacles (stairs) that may be in their way. It also determines on which terrain the patient is able to move.

RANKIN scale; The *Rankin* scale offers a very global approach to disability. It has six scores from 0 to 5 ranging from "No symptoms" (score 0) to "Severe disability" (score 5)

BARTHEL scale: The Barthel index is an index also used preferentially after hemiplegia. In addition to its simplicity, its interest is to give a quick indication of the functional situation. The maximum score is 100, corresponding to complete independence. A bedridden state is rated between 0 and 20, and a dependence that allows a return to the home to be envisaged is above 60,(5)

The rehabilitation techniques practised at the physiotherapy unit of the Yaoundé General Hospital are functional therapy and home exercises.

- **Functional therapy:** Functional therapy includes all activities of daily living, the treatment of which depends on each phase of the hemiplegia, depending on the goal. These phases are: the flaccid phase, the recovery phase and the after-effect phase.
- **Home exercises: These are** follow-up home exercises or activities of daily living that can be performed during or at the end of treatment. The aim is to ensure maintenance.

Each rehabilitation session lasts an average of 30 minutes and is performed three times a week.

er After this examination, the first assessment is carried out on the 1st day of the patient's rehabilitation programme, and the others at intervals of an average of 4 sessions.

The focus of our study is on hemiplegic stroke patients, whose psychological state is very often affected by their sudden and total dependence.

Sampling: Participants were selected for the study regardless of gender, race or ethnicity and those selected to complete the questionnaires were those who gave their free consent.

RESULTS

III-1.1 Population survey

Of the 35 patients with hemiplegia following stroke received during our study period, 7 patients were selected for our study. All of them were male and the number of rehabilitation sessions ranged from 7 to 16 with an average of 11 rehabilitation sessions for 4 assessments.

42.5% of the participants who started their programme less than 03 months after their illness at the YGH while 57.5% did so beyond 03 months (**Table 1**).

Table 1: Distribution of respondents by time to physiotherapy treatment

Time of onset of stroke	Number of patients	Percentage
Less than 3 months	3	42,9%
3-6 months	1	14,3%
6 months to 1 year	1	14,3%
More than 1 year	2	28,5%
Total	7	100%

57.1% of the participants were hypertensive while 42.9% were diabetic. Apart from age, no other factors were cumulative. 100% had the average age of stroke onset (above 50 years)

57.1% of the participants have already followed a rehabilitation programme compared to 42.9% who have not.swc vd

A The physical examination :

Muscular strength

1) **The upper limb**

- During the first visit, 28.6% of the participants had a muscle strength rated between 1/5; 28.6% were at 2/5 and 42.8% had a strength of 3/5 or higher.
- At the 2ème assessment, 57.1% of patients had muscle strength rated at 2/5; 42.9% had strength greater than or equal to 3/5.
- At the last assessment, 33.3% of the patients had a muscle strength of 2/5 while 50% have a strength between 3 and 4/5; and finally, 16.7% had reached 5/5 (**Table 2**).

Table 2: Distribution of patients according to 3 successive assessments of upper limb muscle strength

	1er evaluation		2e evaluation		3e evaluation (final)	
Overall upper limb strength	**Number of patients**	**%**	**Number of patients**	**%**	**Number of patients**	**%**
1	2	28,6%	0	0	0	0
2	2	28,6%	4	57,1%	2	33,3%
3	2	28,6%	1	14,3%	2	33,3%
4	0	0%	1	14,3%	1	16,7%
5	1	14,2%	1	14,3%	1	16,7%
total	7	100%	7	100%	7	100%

2) The lower limb

- During the 1ère assessment, 28.6% of participants had a strength rating of 1/5, 14.2% had a strength of 2/5 and 57.2% had a strength rating between 3 and 4/5
- During the 2ème assessment, all patients had more than 1/5 muscle strength. 57.2% had strength ranging from 2 to 3/5 while 42.9% were at 4/5
- During the last assessment, 57.1% of the participants were at 3/5 and 42.9% of them were at 4/5 (**Table 3**).

Table 3: Distribution of patients according to 3 successive assessments of upper limb muscle strength

	1er evaluation		2e evaluation		3e evaluation (last)	
Overall upper limb strength	**Number of patients**	**%**	**Number of patients**	**%**	**Number of patients**	**%**
1	2	28,6%	0	0	0	0
2	1	14,2%	2	28,6%	0	0
3	2	28,6%	2	28,6%	**3**	57,1%
4	2	28,6%	3	42,9%	**4**	42,9%
5	0	0	0	0	0	0
total	7	100%	7	100%	7	100%

Assessment of walking ability according to the Functional ambulation classification Modified (FAC Modified)

- During the first evaluation, 42.9% of the participants were in class 0; 14.3% in class 4; 28.5% in class 5 and 14.3% in class 6.
- In this second evaluation, we have only 14.3% in class 0; 28.6% in class 1. There was an improvement between class 0 and class 1
- At the last assessment, we have 16.7% in class 1; 16.7% in class 2; 16.7% in class 5; 33.2% in class 6 and 16.7% in class 7.

All patients were above class 1. Some moved from class 1 to class 2, while others moved from class 4 to class 6, and others from class 6 to class 7 (**Table 4)**

Table 4. Distribution of patients according to 3 successive assessments of walking ability according to the functional ambulation classification modified

	1er evaluation		**2e evaluation**		**3e evaluation (last)**	
FAC	**Number of patients**	**Percentage**				
Class 0	3	42,9%	1	14.3%	0	0
Class 1	0	0	2	28.6%	1	16.7%
Class 2	0	0	0	0	1	16.7%
Class 3	0	0	0	0	**0**	0
Class 4	1	14,3%	1	14.3%	0	0
Class 5	2	28,5%	2	28.6%	1	16.7%
Class 6	1	14,3%	1	14.3%	2	33.2%
CLASS7	0	0	0	0	1	16.7%
TOTAL	7	100%	7	100%	7	100%

Evaluation of the degree of autonomy according to the BARTHEL index

- 14.2% had a Barthel score of less than 25/100; 42.9% had a Barthel score of between 25 and 75/100 and 42.9% had a Barthel score of more than 75/100
- At the second assessment, only 14.3% of the participants went from a score of 25 to 30/100 to a score between 50 and 75/100. The rest of the participants showed no improvement in their autonomy
- At the end of the last assessment, there was a clear improvement as 66.7% of the participants had more than 75/100 and 33.4% were between 25 and 75/100 (**Table 5**).

Table 5: Distribution of patients according to 3 successive assessments of *the degree of autonomy according to the Barthel index*

	1er evaluation		2e evaluation		3e evaluation (Last)	
Barthel Index	**Number of patients**	**%**	**Number of patients**	**%**	**Number of patients**	**%**
Less than 25	1	14.2%	1	14.3%	1	16.7%
Between 25 and 50	2	28.6%	1	14.3%	1	16.7%
Between 50 and 75	1	14.3%	2	28.6%	5	66.6%
Plus 75	3	42.9%	3	42.8%	7	100%
Total	7	100%	7	100%	1	16.7%

Evaluation of the degrees of autonomy according to the RANKIN score

At baseline, 14.3% had a severe disability (Rankin 5); 71.4% had a moderately severe to mild disability and 14.3% had no disability

At the second assessment, 85.8% had a mild disability for 50% of them and moderately severe for 50% of them; 14.2% had a moderate disability

At the last assessment 66.7% had mild or no disability while 33.4% had moderate or moderately mild disability (**Table 6**).

Table 6. **Distribution of patients according to 3 successive assessments of the degree of autonomy according to the Rankin score**

	1er evaluation		2e evaluation		3e evaluation	
Rankin score	**Number of patients**	**%**	**Number of patients**	**%**	**Number of patients**	**%**
1	1	14.3%	1	14.2%	2	28.5%
2	3	42.9%	3	42.9%	3	42.9%
3	0	0			1	14.3%
4	2	28.5%	3	42.9%	1	14.3%
5	1	14.3%	0	0	0	0
TOTAL	7	100%	7	100%	7	100%

DISCUSSION

This study was carried out at the Yaoundé General Hospital on the functional rehabilitation of hemiplegic patients following a stroke. It was based on a small sample of 7 patients, all male with an average age of 67 years. Other authors such as BILECKOT et al found patients of both sexes with a predominance of males, whereas PETRILLI et al found patients of both sexes without a predominance of either sex. In our study, this selectivity of males would be due to the unavailability of females to fill in the documents, allowing them to take part in our study. The average age of our study was 67 years; it is described in BILECKOT et all as 58 years and in PETRILLI et all as 64.8 years(6,7)

In most of them (57.1%), high blood pressure was the probable cause of the stroke. The patients underwent an average of 11 sessions of functional rehabilitation, i.e. an average stay of one month in a physiotherapy unit. The Bobath technique and exercise training are the rehabilitation techniques used in the physiotherapy department.

The duration of rehabilitation of patients varies from 2 weeks to 2 months, which is less than the consensus. This is due to difficulties in transporting disabled people, lack of information

on the importance of physiotherapy, the cost of treatment and lack of patience which delay the start of rehabilitation and reduce patient attendance.

The evaluation of :

- Upper limb muscle strength shows that 28.6% on arrival are rated at 1/5, 28.6% at 2/5 and 28.6% at 3/5; lower limb muscle strength assessment 28.6% have 1/5, 14.2% have 2/5 and 28.6% have 3/5. At the end of the stay, the results of the upper limb strength show that: 0% have 1/5; 33.3% have 2/5; 33.3% have 3/5; 16.7% have 4/5. For the lower limb, 57.1% have 3/5 and 42.9% have 4/5.
- Walking ability shows 42.9% in class 0; 14.3% in class 6 at the beginning of the care. At the end of the assessment we have 33.2% in class 6 and 16.7% in class 7.
- Autonomy shows that on arrival, 14.2% of patients have a Barthel score below 25/100 and 42.9% have a Barthel score above 75/100. At the end of the stay, 16.7% have a Barthel score between 25 and 50/100 and 66.6% have a Barthel score above 75/100.
- The degree of disability shows that 14.3% have a severe disability and 14.3% have no disability. At the end of the stay, 28.5% have no disability and 28.6% have a moderately severe to moderate disability.

This study shows through these parameters that physiotherapy improves mobility, movement and reduces disability. The results we obtained show an overall improvement in all participants with regard to muscle strength, walking ability and independence.

Several hypotheses can explain these results: a higher initial ACF and Barthel index at study inclusion, participant compliance.

These results would have been better if all participants had followed their physiotherapist's instructions and prescriptions, including home electrical stimulation, mobility exercises and home strengthening. Apart from these instructions, some patients faced many financial problems and were therefore unable to afford a stimulator, unable to attend rehabilitation sessions, unable to pay for at least 20 rehabilitation sessions.

In order to assess the effectiveness of rehabilitation, it is necessary to use scales of disability and handicap. The most commonly used for basic activities of daily living is the Barthel Index. This scale, which is very useful in the initial phase, is limited by a ceiling effect after a few months of evolution, i.e. the patient may still experience a margin of progression while the score may be at its maximum. Furthermore, this instrument assesses the patient's ability to compensate for his motor deficit (with the other hand, using technical aids, etc.) rather than the extent of this deficit (9,10)

The sensitivity of the Barthel index is too low for the different items. Indeed, the Barthel does not measure either thymic or cognitive functions. However, these two parameters influence the ability to recover from neurological sequelae. The small number of patients is also a limitation because 20 patients are necessary to demonstrate an improvement in autonomy but most of the patients did not agree to participate in the study. Moreover, during the training period, we did not receive a large number of vascular hemiplegic patients: 35 patients during the training period (03 months), of which 7 were retained in the study.

The lack of evaluation by scientific reference tests and the absence of well-defined physiotherapy protocols beforehand makes it difficult to follow up and evaluate the physiotherapy sessions. Nevertheless, we came out of this study with a lot of experience.

CONCLUSION

Functional rehabilitation of hemiplegic patients following a cerebrovascular accident is a major contribution to the care of patients at the Yaoundé General Hospital

In view of the small sample size of our study. The assessment techniques used, Rankin score, Barthel index, functional ambulation classification modified and motor strength assessment, yielded results that showed improvement in the patient's clinical and rehabilitation status. Temporary cessation of rehabilitation of lost functions results in loss of the benefits obtained. Therefore, the future could be to implement a simple self-training programme followed by the

patient. These self-training techniques have shown significant effectiveness at a lower cost to the patient.

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