International Journal of Research in Medical Sciences
Wardojo SSI et al. Int J Res Med Sci. 2023 Jan;11(1):347-350
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20223661

Case Report

Physiotherapy management of acute phase ischemic stroke with Broca's aphasia: a case study

Sri Sunaringsih Ika Wardojo[1]*, Rakhmad Rosadi[1], Kristiyono Putro[2], Ainun Fahadiniyah[1], Nungki Marlian Yuliadarwati[1]

[1]Department of Physiotherapy, Faculty of Health Science, University of Muhammadiyah Malang, Indonesia
[2]Physiotherapy Clinic, Dungus Regional General Hospital, Madiun, Indonesia

Received: 06 November 2022
Revised: 03 December 2022
Accepted: 06 December 2022

***Correspondence:**
Sri Sunaringsih Ika Wardojo,
E-mail: srisunaringsihika@gmail.com

ABSTRACT

According to the WHO, the second most prevalent cause of death worldwide is a non-communicable condition called stroke. According to DALY (disability-adjusted life-year), Indonesia has the second-highest rate of stroke deaths after Mongolia, with 3,382.2/100,000 people. Physical difficulties brought on by this illness includes issues with language and communication. Communication and language difficulties brought on by brain damage are referred to aphasia. Aphasia affects 21-38% of patients with acute stroke, and its effects include short- and long-term morbidity, high death rates, and patient social interaction restrictions. A case study of a 63-year-old patient who spent four days in the Dungus Regional General Hospital and complained of right-side weakness. Despite having trouble speaking, the patient can understand other people's language and instructions. The patient was relaxing after working in the fields before developing problems. The patient's first stroke occurred in 2020, and he later complained of facial pain and trouble walking. The patient had a history of coronary heart disease, diabetes, and hypertension. An increase in the 3rd therapy was seen in a case study that involved an acute ischemic stroke patient treated at the Dungus Regional General Hospital with positioning, sweep tapping and approximation, passive ROM, and PNF for three days. Joint range of motion and muscle tone both exhibit improvements. The patient's capacity to respond to the therapist is also being developed.

Keywords: Acute, Ischemic, Stroke, Aphasia

INTRODUCTION

According to the WHO, the second most prevalent cause of death worldwide is a non-communicable condition called stroke. In 2011, 6.2 million people died from stroke. According to DALY, Indonesia has the second-highest rate of stroke deaths after Mongolia, with 3,382.2/100,000 people.[1] The number of stroke deaths in Indonesia grew by 3.9% over the previous five years in 2018, reaching 10.9%.[2]

According to the WHO, a stroke is a neurological condition that results in localized and generalized neurologic symptoms that can last for 24 hours or longer and may result in death. A stroke can happen when a blood vessel in the brain becomes blocked or bursts, preventing oxygen-rich blood from reaching the brain and causing cell or tissue death. Based on anatomic pathology and clinical manifestations, stroke is split into two categories: ischemic stroke and hemorrhagic stroke. An obstruction in the intracranial blood arteries that reduces the amount of blood flowing to the brain is what causes an ischemic stroke.[1,3]

Stroke is a condition that results in physical disability, including language and communication problems. Aphasia affects between 21 to 38% of those who have experienced an acute stroke, and its effects include short- and long-term morbidity, high death rates, and patient social interaction restrictions. Communication and language difficulties brought on by significant brain damage are referred to as aphasia. often has a left hemisphere impact. The expressive and receptive components of communication, including speaking, understanding, writing, reading, and gestures, can all be impacted by aphasia. Aphasia is a cognitive deficiency disorder that results in functional limitations and psychological discomfort in its victims.[4,5]

CASE REPORT

It is a case study of a 63-year-old patient who spent four days in the Dungus Regional General Hospital and complained of right-side weakness. Despite having trouble speaking, the patient can understand other people's language and instructions. The patient was relaxing after working in the fields before developing problems. The patient's first stroke occurred in 2020, and he later complained of facial pain and trouble walking. The patient had a history of coronary heart disease, diabetes, and hypertension.

Table 1: Laboratorium test results per 17th July 2022.

Variables	Results	Reference values	Status
Two hour PP Glucose, mg/dl	200	100-139	High
Glucose fasting, mg/dl	141	70-100	High
eAG, mg/dl	211.6	70-139	High
HbA1c	9.0%	5,7	High
LDL CHOL, mg/dl	139	130	High
Triglicerides, mg/dl	142	70-140	High
Uric acid	5.3	2-6	Normal

PP: post prandial; eAG: estimated average glucose; LDL: low density lipoprotein; CHOL: cholesterol.

Table 2: MMT results on right-side of body parts.

Region	T0 (baseline)	T1 (1st treatment)	T2 (2nd treatment)	T3 (3rd treatment)
Shoulder	1	1	1	1
Elbow	1	1	1	1
Wrist	1	1	1	1
Hip	1	1	1	2
Knee	1	1	1	2
Ankle	1	1	1	1

T: treatment.

Table 3: Asworth scale result on right-side of body parts.

Region	T0 (baseline)	T1 (1st treatment)	T2 (2nd treatment)	T3 (3rd treatment)
Shoulder	1	1	1	1
Elbow	1	1	1	1
Wrist	1	1	1	1
Hip	1	1	1	2
Knee	1	1	1	2
Ankle	1	1	1	1

T: treatment.

Table 4: Barthel index results.

Activities	T0 (baseline)	T1 (1st treatment)	T2 (2nd treatment)	T3 (3rd treatment)
Feeding	0	0	0	0
Bathing	0	0	0	0
Grooming	0	0	0	0
Dressing	0	0	0	0
Bladder control	10	10	10	10

Continued.

Activities	T0 (baseline)	T1 (1st treatment)	T2 (2nd treatment)	T3 (3rd treatment)
Bowel control	10	10	10	10
Toilet use	0	0	0	0
Transfers (bed to chair and back)	0	0	0	0
Mobility on level surfaces	0	0	0	0
Stairs	0	0	0	0
Total	20	20	20	20

T: treatment.

Vital signs included a temperature of 36°C, a blood pressure of 160/120 mmHg, a pulse rate of 72 beats per minute, breathing 20 times per minute, a height of 170 cm, and a body weight of 70 kg. Uric acid levels were steady, while blood sugar and cholesterol levels rose as a result of the testing (Table 1). The results of the ECG indicated that there had been an anterior myocardial infarction. The patient received pharmaceutical care while in the hospital, including intravenous sodium chloride (NaCl), intravenous pantoprazole, intravenous citicolin, amlodipine, bisoprolol, aspirin, alprazolam, glimepiride, and CP6.

Physical examination revealed that the patient still exhibited right-side weakness, hypotonic muscles, was unable to turn his body to the right or left, was unable to support his own weight when sitting, and was given an adult diaper to help with feces and urine excretion. The patient frequently sobbed inconsolably because he had trouble expressing himself.

While all physiological reflexes were normal, the specific examination conducted produced negative results for the Chaddok reflex but positive results for the pathological Babinsky and Oppenheim reflexes. The right side of the body received a score of 1 on the Asworth scale and the manual muscle testing test in every area. A value of 20 on the Barthel index assessment indicates that the patient was still reliant or need whole assistance from others.

For three days of treatment, patients received activities such as sweep tapping and approximate motion, passive range of motion (ROM), and proprioceptive neuromuscular facilitation (PNF). The outcomes revealed that there was an improvement after the third day of treatment (Table 2). Although there was a rise in hip and knee muscle tone and the patient can do hip and knee flexion motions, they were not regulated, and they were unable to undertake functional activities on their own. The patient could communicate by making sounds and saying a few phrases. The patient's family was instructed to move the patient to the left or right every two hours to prevent decubitus.

The patient's family can perform the exercises and doses recommended by the therapist to improve the patient's functional capacity. Exercise in the proper amount was anticipated to stop any muscular contractures and restore the patient's capacity for independent activity daily living (ADL).

DISCUSSION

When there is a disruption in blood flow, the supply of glucose and oxygen to the brain will either decrease or cease entirely, which can result in an ischemic stroke. Global ischemia (stroke from hypertension) and embolism account for 20%, 45%, and 45%, respectively, of ischemic strokes.

The other causes are unknown.[6] Vascular blockage, the most common cause of ischemic stroke, is characterized pathologically by atherosclerosis. When atherosclerotic plaques are present, blood flow to the target location will dwindle or even cease. The part that lacks blood flow will receive blood flow as compensation from collateral blood arteries that are still functional. However, if the collateral system is insufficient, there will be damage at the cellular level and potentially cell death in the area. Symptoms won't show up as long as the collateral system is still functioning properly. Clinical symptoms have not yet been noticed when blood flow has decreased to a certain amount, but they will manifest once it is insufficient to meet the brain's basic requirements.[7]

Aphasia is one of the clinical signs that can be observed. Aphasia is a language impairment that impairs a person's ability to comprehend and express themselves in verbal and nonverbal communication, including reading, writing, speaking, gesturing, drawing, and counting. All language modalities, including spontaneous speech, language comprehension, repetition, naming, reading, and writing, can be impacted by this condition.[8]

Aphasia can happen when a lesion in the brain results from an infarction brought on by inadequate blood flow. One will have Broca's aphasia, also known as motor aphasia and expressive aphasia, if a lesion affects the frontal lobe, which contains the Broca's region, which is located in the dominant hemisphere.

When a person has this type of aphasia, their ability to pronounce words is compromised, while they can still grasp language and have difficulty expressing themselves verbally or in writing.[9] Positioning, sweep tapping and approximation, passive ROM exercise, and propioceptive neuromuscular facilitation were used as therapies in this case study (PNF). Positioning was recommended to lower the risk of decubitus ulcers and other problems where local tissue damage resulted from the skin being depressed for an extended period of time, leading to

abnormalities of the microcirculation, tissue hypoxia from ischemia, and tissue necrosis.[10] To enhance muscle tone in patients with acute ischemic stroke, sweep tapping and approximation are provided. The stimulation of proprioceptives in muscles, tendons, and joints with withdrawal, tension, and stimulation causes proprioceptive impulses to arise.[11] By focusing on the joints, approximate is a proprioceptive stimulation technique that encourages the surrounding muscles to contract and maintain joint position.[12] Sweep tapping, which involves massaging the patient's limbs with the palm of the hand to stimulate tactile sensations and cause the proper muscular contraction response, aims to increase muscle tone.[13]

Patients receive passive range of motion exercises usually twice daily in doses of 1 set of 8 repetitions for the upper and lower extremities on the body's weak side. The purpose of these workouts was to considerably improve muscle strength and functional capacity. Long muscles will be able to contract with more force than short muscles. Sarcomeres at the ends of muscle fibers vanish if a muscle was kept in an ongoing state of contraction. The muscles were continuously altered during this process to have a length appropriate for muscle contraction and return to necessary functions. Within a few weeks, the process of altering shape (diameter, length, strength, blood supply) occurs; typically, muscle contraction proteins can be entirely replaced within two weeks.

If hemiparase patients were not given ROM exercises, contractures will develop as a result of muscular atrophy, weakness, and lack of muscle balance, which causes the muscles to shorten due to joint swelling and stickiness. There may also be joint and spastic discomfort.[14]

PNF administration as a form of therapy aims to support the neuromuscular system by enhancing proprioception. This technique involved presenting stimuli that corresponded to the intended response, which will ultimately result in coordinated ability or movement. The brain will exhibit plasticity throughout this stage, or the capacity to adjust to and change organizational and functional requirements. The PNF approach tries to inculcate appropriate movement patterns, enhance coordination, and bring out muscular tone in a postural manner.[15]

CONCLUSION

An increase in the 3rd therapy was seen in a case study that involved an acute ischemic stroke patient treated at the Dungus Regional General Hospital with positioning, sweep tapping and approximation, passive ROM, and PNF for three days. Joint range of motion and muscle tone both exhibit improvements. The patient's capacity to respond to the therapist is also being developed.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Organizations WH. Noncommunicable Disease. Available at: https://www.who.int/health-topics/non communicable-diseases#tab=tab_1. Accessed on 20 October 2022.
2. RIKESDAS. Balitbang Kemenkes RI. Riset Kesehatan Dasar. Balitbang Kemenkes RI; 2018. http://repository.litbang.kemkes.go.id/3514/. Accessed on 20 October 2022.
3. Mardjono M, Sidharta P. Neurologi Klinis Dasar. Penerbit PT Dian Rakyat; 1989.
4. Berthier M. Post stroke aphasia: epidemiology, pathophysiology, and treatment. Drugs Aging. 2005;22(2):163-82.
5. Berthier M, Davila G, Garcia-Casares N, Moreno-Torres I. Post stroke aphasia. In: Schweizer T, Macdonald L, eds. Behavi: Springer; 2014.
6. Hickey J. The clinical practice of neurological and neurosurgical nursing. Lippincot William & Willkins; 2003.
7. Machfoed MH, Susilo H, Suharjanti I, Pambudi P. The 12th continuing neurological education. 12th ed. In: Machfoed MH, Susilo H, Suharjanti I, Pambudi P, eds. Pusat Penerbitan dan Percetakan Unair (AUP); 2010.
8. Kusumoputro S. Gangguan Berbahasa. Balai Penerbit FKUI; 1992.
9. Amila A, Sitorus R, Herawati T. Pengaruh Pemberian The effect of augmentative and alternative communication (AAC) on the functional ability of communication and depression in motor aphasia patients. Indon J Nurs. 2015;18(2):95-101.
10. Wayunah W. Effectiveness of sleep position change time on the incidence of decubitus in stroke patients in X Hospital, Indramayu district. J Kesehat Indra Husada. 2018;6(2).
11. Morén C, Welmer AK, Hagströmer M, Karlsson E, Sommerfeld DK. The effects of “physical activity on prescription” in persons with transient ischemic attack: a randomized controlled study. J Neurol Phys Ther. 2016;40(3):176-83.
12. Sidharta P. Tata Pemeriksaan Klinis Dalam Neurologi. 3rd ed. Dian Rakyat; 1995.
13. Sukadarwanto I. Assesment Pada Penderita Stroke Pelatihan FT VI Optimalisasi Fungsi Senso-Motorik Pada. Penderita Stroke; 2002.
14. Guyton. Basics of public health nursing/Nasrul Effendy. 2nd ed. Jakarta EGC; 1998.
15. Setiawan. Teori Plastisitas. Workshop Dimensi Baru Penatalaksanaan Fisioterapi Pada Kasus Stroke Secara Paripurna; 2007.

Cite this article as: Wardojo SSI, Rosadi R, Putro K, Fahadiniyah A, Yuliadarwati NM. Physiotherapy management of acute phase ischemic stroke with Broca’s aphasia: a case study. Int J Res Med Sci 2023;11:347-50.