

Post-Stroke Language: Case Study of Medical Rehabilitation Patients at Dr. Suyoto Hospital Bintaro South Jakarta

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Abstract— The purpose of this research is to describe the post-stroke language in the case review of hospital medical rehabilitation patients Dr. Suyoto Bintaro South Jakarta; explains the differences of pre- and post-stroke language, speech-language barrier and stroke patient writings. The methodology of this research is qualitative with research method from cognitive psychologist, Robert J. Sternberg. Therefore, data collecting is done by combining case study as well as self-reports such as verbal storytelling, self-assessment, or diaries. Data collection techniques are complemented by interview techniques, and medical documentation of medical rehabilitation records. The results of this research are the findings of post-stroke language disorders in the form of speech impediment (aphasia), delayed speech-language, and the barrier of the language of writing. In the first trimester to the second, the patient's speech impedance was overcome so that the aphasia disorder is discontinued. In addition, patient also faces syntactic and semantic barriers. Syntactically, the patient has difficulty forming long and complex words. While semantically, the patient would experience difficulty in connecting the meaning of the word he thinks and what she actually meant. The language barrier of the patient's writing is difficult to read, except the post 2 years of stroke. For written language, there is a change in the shape of the writings and reduced ability to write with her right hand from before.

Keywords— *Language, stroke, patient, post-stroke, disorder*

I. INTRODUCTION

Language is the value that results from the intellectual activity [1], [2]. This activity marks human privilege over other creatures. Due to the human mind's capability to speak, both from the level of receptive (listening and reading) to the productive (speaking, writing) [3]. However, it is hampered when a person gets a stroke, a brain attack or a brain attack related to a person's neurology or nerves [4], [5].

One of the effects of the stroke is the stroke patient will be hampered to produce sounds to the sequence of the human language. While human language comes from sounds that are repeatedly spoken, translated from words, and sentences that are then agreed upon in society. Therefore, language as the sounds expressed by each community to is used to convey its goals [6]. For stroke sufferers who are attacked on the brown nerve, they will experience difficulty in language.

As a result, language as a communication tool used to convey the thoughts of someone with others is also hampered. Moreover, language as a social network is used to transmit sounds and language systems through social groups such as family, neighbors, friends and others [7]. They will also experience communication constraints with stroke patients. Humans never stop speaking especially when they relate and interact well with their children, husbands, wives, loved ones [8]. Therefore, the activity of language and human speech will always take place in the earth.

But after a stroke, how can a stroke patient perform his or her language functions? Will the stroke patients face obstacles in communicating speech and writing languages? On the basis of these problems, the research of language post stroke becomes important.

II. METHODS

This research uses qualitative method. This research is done through observation of the facts and empirical phenomena experienced by the researcher. Therefore, the source of this research data is I myself, both as the subject (researcher) and the object (one of the stroke patients at Suyoto Hospital Bintaro Medical Rehabilitation). Besides being a data source, this patient is also a research sample. Data collection techniques uses one of the methods of cognitive psychology research, I choose by combining case studies as well as self-reports such as verbal storytelling, self-assessment, or diary) [9, pp. 14–17]. Data analysis technique used in this research is inductive and deductive technique (back and forth), based on the theory that has been proposed.

III. RESULTS AND DISCUSSION

A. *Language Barrier in Speaking*

The human speech tool has two main functions which are biological and linguistic functions. Biological functions such as the lungs to breathe, tongue to taste, and teeth to chew. But the linguistic function is to use speech tools to speak. The linguists agree that the tools of speech must be in harmony to produce the language, consisting of 25 utterances including: lungs, windpipe, throat, vocal cords, cricoids, thyroid, arthenoid, throat cavity wall, epiglottis, tongue root, base of the tongue, middle of the tongue, tongue leaves, tongue tip,

throat, soft palate, hard palate, gum (dental arch, upper teeth, lower teeth, upper lip, lower lip, mouth, oral cavity, and nasal cavity)[10].

In the case of a stroke, the patient's speech-tool for producing language begins to look non-harmonized. The obstacles that occur can be observed in the first trimester until the second trimester after the occurrence of stroke. The patient says "ask for ginger clothes" for the meaning of "ask for green clothes"; "Please have the baygon turned on" for the meaning of "please have the lights turned on" to her assistant. The patient also said the word "mbak Sari" for the word "mbak Sri"; "Mbak Serar" for the word "mbak Sekar"; "Doctor Ferdi" for the word "doctor Fredi"; and "doctor Avin" for the word "doctor Alvin" [11]. Impaired speech communications of the patient, affected the nervous system from the backbone and brain consisting of the brain stem (brain stem) and cerebral cortex (cerebral cortex) became very severe. Because the spinal cord and cerebral cortex, which is the central nervous system of the patient at that time, is disturbed, the physical and mental activities controlled by the nervous system are also disrupted, including the language of his speech [12, p. 203]. Stroke also becomes one of the cerebrovascular diseases that kill the neurons by cutting and even stopping the blood supply to get the oxygen directly[13, p. 68].

Intra-lingual, speech-language disorder occurs in the phonological, syntactic, and semantic domains. In the phonological domain especially phonetics, the patient has difficulty in compiling double consonant on letters such as sr / kr / fr / lv. Barriers to air or airflow coming out of the lungs can occur from the deepest place, the vocal cords, to the outer place, the upper and lower lips. The sounds mentioned before are transmitted to the listener's ear through the airwaves. When a sound is ejected, the air is shaken by it and forms a wave. The waves carrying this sound move from the front of the speaker's mouth to the listener's ear. With the mechanisms that exist in the ear, humans receive this sound and through sensory sound nerves that are then sent to the brain for processing and then captured [12, p. 48]. As a result, sensory sound nerves are said to be disturbing stroke patients and are not in harmony with sounds spoken with the desired meaning. Textually, the SPOK syntax is correct in word order, but it is unacceptable to say "ask for ginger clothes" because the word "ginger" which describes the word "clothes" is explained to be unacceptable. Similarly, in the semantic level, the phrase "ask for ginger clothes" can only be interpreted contextually between speakers (patients) and speakers (assistants). To get the proper meaning, speakers take steps such as observing the clothes that speakers use often and or using sign language for the clothes the speaker wants.

In addition to intra-lingual disorders, extra lingual patients experience communication barriers. Patients tend to be quiet, especially when in a crowd for example in meetings and discussion forums. Conditions felt by the patient when hearing a voice is metalingual and metacognition at a time, then the endurance of her brain to accommodate information is still heavy. As a result, the patient experiences pain in her brain's

nerves, hence the thing that the patient is feeling when hearing the variant sounds, such as crowds (formal and non-formal), debates such as patient discussion forums, they will feel very strong pain in the eardrum, head, and eyes. In fact, the patient feels the right side of the body burning as she listens for the variant voices at one time simultaneously. Therefore, acceptable sounds in the patient's condition in the early post-stroke period that can make limited communication, or one-to-one dialogue between speakers and speakers.

Even in that situation the patient feels that a series of spinal cord is stiff and numb. According to Gleason, stroke patients who get an attack on the left hemisphere will experience some language function disorders. If *Broca* states that the *nous parlons avec l'hemisphere gauche*, we speak regarding the left hemisphere, then it is estimated between 200 million fibers --- the number of fibers from 2 hemispheres --- the so-called *corpus calosum* on the left hemisphere of this research patient becomes disturbed [13, p. 78].

Looking at the speech-language barrier of the patient above, thus in the early period to a year post-stroke, the patient faced disorders of *broca* and *anomic aphasia* [14]. *Aphasia broca* is a speech disorder when producing speech. Disturbances that occur are in areas adjacent to the motor cortex hence speech utilities, including the shape of the mouth becomes disturbed. Hence this *apashia* causes disruption of speech planning and expression. The sentences produced were broken. And often the pronunciation is not comprehensible. In addition to *broca aphasia*, patients also experience *anomic aphasia*, which is a speech disorder in the form of the patient's inability to relate the concepts and sounds or words that represent them.

B. Language Barriers in Writing

In contrast to the spoken language, is a way of conveying, expressing feelings and sharing personal experiences from a writer to a reader, using written language [15]. However, writing skills are not an easy skill to achieve, as the writing process does not merely transfer letters and linguistic symbols as they are. Writing skills require a process of thinking, experience, and enrichment of the writer's cognitive abilities.

For that reason, the form of writing made by the patient who has the disorder is shown below:

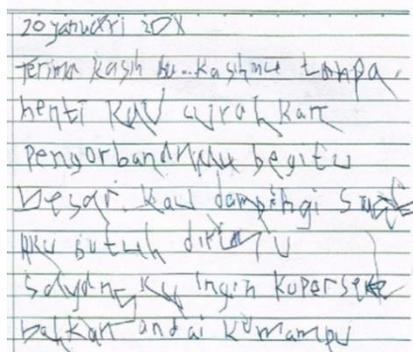


Fig. Post Patient Post 3 Months, January 20, 2011

The Figure 1 above shows that the language and biology or anatomy of the patient are interconnected. Biologically, the cerebral cortex or often called the cerebrum shows the midbrain and the forebrain. It is this cortex that gives humans the extraordinary ability to process information in the form of speech and writing language. This cortex or cerebrum receives information from the whole body that comes from the hundreds of thousands of sensory receptors in the eyes, skin, ears, muscles, and joints [16, pp. 82–83]. *Serebrum* (in Latin meaning small brain) controls body coordination, balance and muscle conformity, and some aspects of memory involving procedure-related movements [9, p. 41]. Damage to this section will cause difficulties to perform powerful, fast, and directional movements [16, p. 85]. This includes attempts to perform writing activities. Therefore, when a stroke occurs in the left hemisphere of the patient, the sensory receptors on the skin surface of the left hemisphere redirects the motor responses to the right side of the body. This event is often called contralateral where counter means opposite and lateral means side or it can also be referred to from one side to the opposite side [9, p. 43].

In the case of this research, due to the stroke of the patient that happens on the left hemispheric in a *contralateral* way, therefore the contralateral part of her right side is impaired and cannot be used to the maximum. The patient cannot use her right hand to eat, picking up and moving objects, and write. As a result, the patient's right hand has not been able to receive the maximum response, because the muscles of her right side are disturbed. Therefore, the patient has not been able to coordinate and balance her hand when writing. Her right hand's muscle was still weak while holding the pen and the letters that she wrote were seen as a picture of unorganized grass.

According to an occupational therapist who handles hers, "the patient's writing is very difficult to read. In every letter she writes, it looks as if there is hair or grass). Coordination when holding the pen is not good. To hold the pen alone was so difficult that the scratch letters are hard to read. Her muscles are weak and she needs an occupational therapy stage. In occupational therapy, the stroke patient therapy in writing passes through three stages. The first stage is stretching by doing small exercise to stretch and flex the hand muscles from the bottom and up motion. The second stage is balancing which is to exercise moving goods or stand while writing or painting. The third stage is fine motor exercises which is to train the muscular abilities associated with hand function including the writing function. (Safitri, Ainil, 2013, occupational therapist at RS.DR. Suyoto, July 18, 2003).

The written language barrier and the patient's speech above are the impact of the patient's left-brain attack. The type of stroke of the patient is included as the type of heavy stroke. According to dr. Endang, "This is called a stroke, it must be heavy. If it is light, the name would not be a stroke but transition. This transition is a brief attack and within 24 hours it is back to normal. But if the stroke is severe then the healing leaves the remaining symptoms of post-stroke (squelle). Even if the patient faces a language barrier, her memory and

cognition can be saved. That's what happens to this patient (Ernandini, Endang SPRM, medical rehabilitation specialist for the hospital of Dr. Suyoto, July 22, 2013).

IV. CONCLUSIONS

Language barriers can occur in people who have a stroke (brain attack) in the left hemisphere section. For this research, the patient has a brain attack on the left hemisphere and also the middle area of the brain. As a result, the patient experiences speech-language barriers or acute post-stroke aphasia during the first trimester until the second trimester. After taking the therapy, the patient can go through a sustained aphasia disorder. Nevertheless, the effect of the remainder of the stroke in her speech is still visible like slower and sometimes discontinuous speech, systematic utterance that is sometimes unstable, and the lack of endurance of listening or maintaining an opinion.

In addition, the patient of this research also experienced a barrier in the language of writing. The language barrier has a longer duration, especially in the form of writing using her right hand directly. The muscles of her right hand are still weak causing the coordination and balance of the attraction of the letter she writes to be not as strong as before the occurrence of the stroke. Therefore, the patient experiences agraphia (writing disability) post-stroke. This research requires further research in the form of a multidisciplinary approach (language, medicine, and psychology) which requires further observation of the function of language, brain, and post-stroke cognition.

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