



## Case Report

# A Case Report of a Stroke Patient with Dysarthria Treated with Korean Medicine



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## ABSTRACT

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This case study examined the effect of Korean Medicine on a 72-year old male with a habitual history of smoking and drinking, and a family history of hypertension who had suffered an acute stroke. A couple of months later he complained of upper extremity weakness and was diagnosed with dysarthria. The patient received Korean Medicine treatment of acupuncture and herbal medicine for 39 days at the Samse Oriental Hospital, in conjunction with physiotherapy and Western medicine. Articulation accuracy, vowel accuracy, alternation and speed of reading sentences were evaluated every 7 days. The results showed that the patient had improvement of articulation (10%) and vowel (37%) accuracy, alternation (12%) and speed of reading sentences (28%) suggesting that Korean Medicine treatment contributed to this progress.

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## Introduction

Strokes are the 2<sup>nd</sup> most common cause of death worldwide [1], and approximately 20%–30% of stroke survivors suffer dysarthria [2]. Dysarthria is associated with physiological function and self-identity, social and emotional confusion, and feelings of stigmatization [3]. Dysarthric speech is incoherent because of poor control of oral articulator muscles, particularly the tongue and lips, and poor respiratory control [4]. In the Western world, speech therapy is used to improve dysarthria. In Korea, there are few studies of treatment of dysarthria after a stroke. In this case study, the results of using Korean medicine to treat a patient suffering from dysarthria are reported. The patient was admitted to Samse Oriental hospital on April 8, 2017 and had treatment until discharge on July 1, 2017.

## Case Report

A 72-year-old male, habitual smoker of 40 years and daily drinker, with a family history of hypertension on his father's side,

was admitted to Samse Oriental Hospital (April 8, 2017) where blood tests and an MRI brain scan was performed. Clinical chemistry results were in the normal range but radiology showed acute infarction in the right basal ganglia region (Fig. 1). On the T2WI and Flair images, multiple small high signal intensities in both periventricular white matter were noted (Fig. 1). There was no evidence of the pathologic condition in the cerebral arteries, and he was diagnosed as having had an episode of acute stroke. On June 4, 2017, after waking up, the patient had a feeling of weakness in his left arm. He received treatment at the Samse Oriental Hospital until July 1, 2017.

## Treatments

**Acupuncture:** A Korean medical doctor with 3 years clinical experience, performed acupuncture at 7 acupoints: “Seven points of CVA”; Baekhoe (GV20), Gokbin (GB7), Gyeonjeong (GB21), Pungsi (GB31), Joksamni (ST36), Hyeonjong (GB39), Gokji (LI11). Disposable 0.20 mm × 30 mm-sized stainless-steel needles (Dongbang Acupuncture Inc., Korea) were used every morning

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Fig.1. Brain MRI (April 08, 2017).

at 9:00 AM, the treatment lasted for about 15 minutes. In the afternoon, sterilized, single use needles (0.20 mm × 30 mm, stainless steel, Dongbang, Korea) were used for the intervention using directional supplementation and draining (DSD), needles that were inserted at Joksamni (ST36). It remained for 7 minutes and 30 seconds in the supplementation direction and then the direction was changed and maintained for 7 minutes and 30 seconds more. At the same time, a needle was inserted at Yeongok (KI2) along the draining direction, at Igan (LI2) along the supplementation direction for 15 minutes.

**Herbal medicine:** Banhahoobagtang powder insurance medicine (mixed extract, JungWoo Medicines, Seoul, Korea) was prescribed from May 29, 2017 until July 2, 2017. One packet was taken 3 times a day, after meals.

**Physiotherapy:** Transcutaneous Electrical Nerve Stimulation (TENS) and infrared heat therapy were performed on the injured part of the patient's body once a day from May 29, 2017 until July 2, 2017.

**Western medicine treatment:** Western medicine was prescribed daily during from May 29, 2017 until July 2, 2017 (Table 1).

**Speech Assessments:** The assessment tools used in this study were developed by Lee [5] to evaluate the effects of articulatory organ training on speech enhancement of patients with a paralytic speech disorder.

**Articulation accuracy:** An articulation evaluation sheet was used to check the accuracy of the phonemes according to the test site, and the number of correctly pronounced phonemes were calculated as an average percentage of 3 tests. On May 23,

the accuracy of articulation was 87.29% and on June 29, it was at 97.09% (Fig. 2).

**Vowel accuracy:** 10 basic vowels were used in the articulation test, and the number of correctly articulated words were recorded. On the first day of treatment (May 23), 6 words were articulated correctly, and the last day of treatment (June 29), 10 vowels were pronounced correctly (Fig. 3).

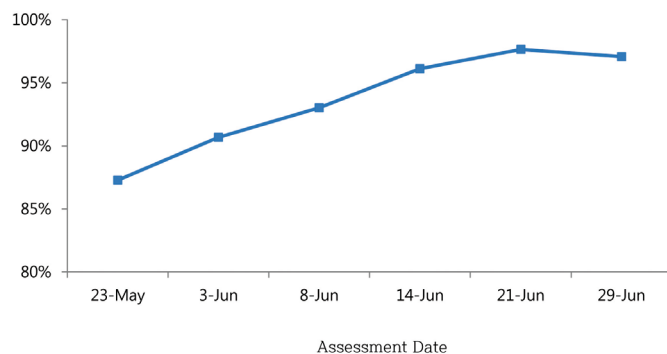


Fig. 2. The treatment effect on articulation accuracy over time.

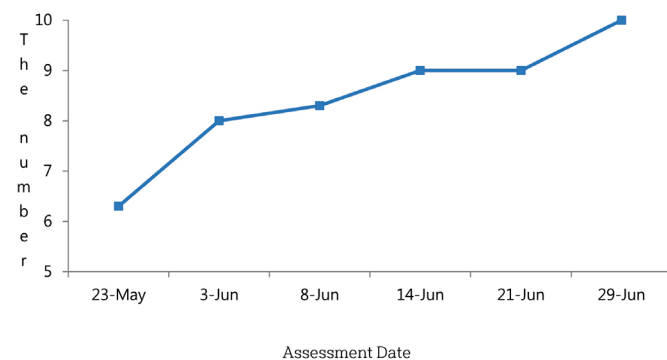


Fig.3. The treatment effect on vowel accuracy over time.

Table 1. Medication Administered at Samse Oriental Hospital Following the Diagnosis of an Acute Stroke.

Medication	Dose	Medication Purpose
Lavit-A Tablet	1T BID (8AM,7PM)	Antiulcerants
Plvix Tablet	1T QD (8AM)	Antithrombotics
Sermion Tablet	1T BID (8AM,7PM)	Circulatory Improvement Agents

BID, bis in die (twice a day); P, post meridiem; QD, quaque die (once a day); T, tablet; TID, ter in die (3 times a day).

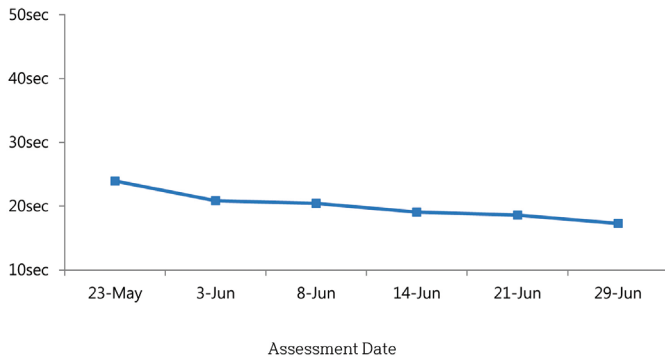


Fig. 4. The treatment effect on alternate exercise velocity over time.

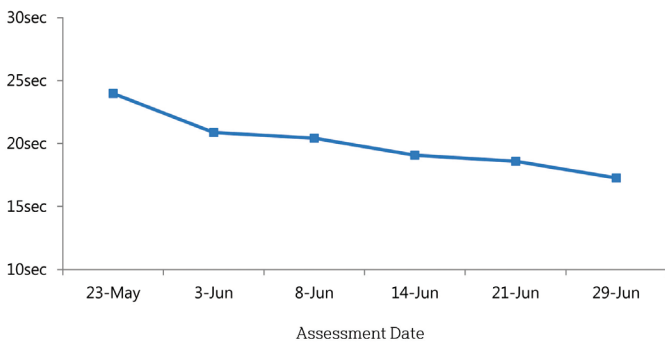


Fig. 5. Treatment effect on the speed of reading a sentence containing 69 syllables over time.

**Alternate exercise velocity test:** To evaluate the degree of continuous articulation, we noted the time spent repeating “Papapa,” “Tatata” and “Kakaka” 10 times, respectively. On May 23, the time taken to repeat 10 cycles of “Papapa,” “Tatata” and “Kakaka” was 27.47 seconds, and on the June 29, 24.21 seconds was recorded (Fig. 4).

**Speed of reading sentences:** The patient was asked to read a sentence containing 69 syllables that was presented to him and the time taken was recorded. On May 23, it took 23.96 seconds to read the sentence and on June 28, it took 17 seconds (Fig. 5).

## Discussion

Speech disorders are conditions that include; aphasia, dysarthria, and neurological abnormalities [6]. Aphasic patients may have trouble understanding the spoken word and may not understand what someone is saying in conversation or on TV [7]. Dysarthria is caused by damage to areas of the brain that control language; as a result, their speech may sound slurred because they have problems making sounds correctly [7]. Neurological abnormalities are caused by fundamental changes in the cerebral cortex; such as dementia [8]. In this case study, the patient had no difficulty in understanding spoken language, but his speech was slurred and he had difficulty in communicating, indicating that the patient had dysarthria.

Acupuncture treatment for dysarthria used 3 main acupoints; Joksamni (ST36), Yeongok (KI2) and Igan (LI2) with reference

to “Sa-amdoinchimguyogyeo!” According to a study conducted by Song et al [6], these acupuncture points have a significant therapeutic effect on language, compared to body acupuncture; “Joksamni” helps vocal energy, “Yeongok” protects the lungs by releasing heat, and “Igan” also acts to help the lungs as a “suyangmyeongdaejang-gyeong” [8]. Furthermore, the patient’s sputum was assessed and thought to impede the effectiveness of the acupuncture treatment, so herbal medicine was administered to remove the sputum.

The accuracy of articulation increased from 87.29% at the start of treatment to 97.09% at the time of discharge. In the vowel accuracy test, the average score increased from 6.3 words out of 10 correctly pronounced at the time of treatment, to 10 at discharge. The speed of the alternating exercise where the time taken to repeat 10 cycles of “Papapa,” “Tatata” and “Kakaka” decreased from 27.47 seconds to 24.21 seconds, indicating that the degree of continuous articulation had improved. In the reading sentence test where 69 syllables were read, the time decreased from 23.96 seconds to 17.26 seconds.

Korean medicine seems to be effective in improving speech disorders, as reported in this case study. At the point of hospitalization, the patient’s words were incoherent but at the time of discharge, language crumbling was reduced, and the patient was less likely to repeat words.

There are several limitations to this study. It is unclear whether the western medicines and physiotherapy treatment affected the improvement of language as this could not be controlled for. Also, this is a case study of 1 patient and many more patients would be needed to test a hypothesis and power a study.

## Conflicts of Interest

The authors have no conflicts of interest to declare.

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