



Original Article

# A comparison of the swallowing function and quality of life by oral intake level in stroke patients with dysphagia

DEOK GI HONG, PhD, OT<sup>1)</sup>, DOO HAN YOO, PhD, OT<sup>2)\*</sup>

<sup>1)</sup> Department of Occupational Therapy, Wonkwang University, Republic of Korea

<sup>2)</sup> Department of Occupational Therapy, Konyang University: 158 Gwanjeodong-ro, Seo-gu, Daejeon 302-832, Republic of Korea

**Abstract.** [Purpose] This study was conducted to compare the swallowing function and quality of life (QOL) in stroke patients with dysphagia by oral intake level. [Subjects and Methods] Seventy-nine stroke patients with dysphagia were enrolled. All subjects were evaluated by using the Swallowing Function Test (SFT) and the Swallowing Quality of Life (SWAL-QOL) questionnaire. The subjects were divided into two group based on the SFT score: oral intake (OI) and non-oral intake (NOI) groups. The SFT and SWAL-QOL scores were then compared between the groups. [Results] There were significant differences in items in the SFT, except for the respiratory item, between the OI group and the NOI group. There were significant differences in all items on the SWAL-QOL, except for the sleep item, between the OI group and the NOI group. [Conclusion] Oral intake was positively associated the swallowing function and QOL in stroke patients with dysphagia. Safe intervention using oral intake treatments during dysphagia rehabilitation may have a positive effect on the patients' swallowing function and QOL.

**Key words:** Dysphagia, Oral intake, Swallowing Function Test

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## INTRODUCTION

Previous studies estimate that the prevalence of dysphagia after stroke ranges from 33–73%<sup>1, 2)</sup>. Dysphagia after stroke can cause complications such as aspiration pneumonia, malnutrition, dehydration and asphyxia, which may lead to increases in medical expenses, delays in rehabilitation, and decrease in quality of life (QOL)<sup>3–5)</sup>.

Many treatments have been developed for the successful rehabilitation of dysphagia patients<sup>6)</sup>. There is expensive research, previous and ongoing, regarding dysphagia treatments and recently studies focusing on QOL are being actively pursued<sup>7–9)</sup>.

The validity of the Swallowing Quality of Life (SWAL-QOL) questionnaire for assessing QOL in stroke patients with dysphagia has been established through studies carried out in multiple countries<sup>10–12)</sup>. Additionally, studies comparing the QOL before and after various electrical stimulation treatments have been published<sup>7, 9)</sup>.

## SUBJECTS AND METHODS

Seventy-nine participants diagnosed as having stroke with dysphagia participated in the present study. The study participants were enrolled from inpatients in a rehabilitation hospital in South Korea. All participants provided written informed consent to participate in the experiment in accordance with the ethical standards of the Declaration of Helsinki. The following research was approved by the bioethics review board at Konyang University Hospital. Descriptive statistics for the participants are presented in Table 1.

\*Corresponding author. Doo Han Yoo (E-mail: glovia@konyang.ac.kr)

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**Table 1.** Descriptive statistics for the participants (n=79)

Characteristics	OI group (n=44)	NOI group (n=35)
Age (years) <sup>a</sup>	61.3 ± 12.6	67.1 ± 14.3
Gender (male/female)	26/18	21/14
Affected side (right/left)	19/25	10/25
Type (Infarction/Hemorrhage)	24/20	20/15
Time since stroke (months) <sup>a</sup>	3.21 ± 2.56	3.52 ± 2.52

OI: oral intake; NOI: non-oral intake

<sup>a</sup>Values are mean ± SD. All other values are numbers of patients.

**Table 2.** Comparison of SFT between the two groups (n=79)

	OI group (n=44)	NOI group (n=35)
Alertness*	2.91 ± 0.28	2.13 ± 1.04
Cooperativeness*	2.91 ± 0.28	1.90 ± 0.98
Respiratory	2.94 ± 0.23	2.25 ± 0.99
Head control*	2.82 ± 0.45	2.27 ± 0.99
Maintain posture*	2.80 ± 0.47	2.13 ± 0.97
Tongue movement*	2.65 ± 0.48	1.90 ± 0.91
Tongue strength*	2.45 ± 1.63	1.63 ± 0.86
Jaw control*	2.88 ± 0.32	1.77 ± 0.88
Lip tone*	2.80 ± 0.40	1.90 ± 0.88
Buccal tone*	2.60 ± 0.49	1.59 ± 0.81
Palate reflex*	2.88 ± 0.32	1.75 ± 0.99
Saliva swallowing*	2.88 ± 0.32	1.54 ± 0.95
Voluntary cough*	2.48 ± 0.70	1.29 ± 0.87
Laryngeal elevation*	2.60 ± 0.65	0.29 ± 0.50
Cough pre/post swallowing*	2.31 ± 0.63	0.31 ± 0.60
Voice change*	2.40 ± 0.65	0.36 ± 0.57
Throat clearing*	2.37 ± 0.68	0.25 ± 0.48
Total score*	45.80 ± 3.85	25.52 ± 10.05

\*p<0.05; Values are mean ± SD of SFT score.

SFT: swallowing function test

**Table 3.** Comparison of SWAL-QOL between the two groups

	OI group (n=44)	NOI group (n=35)
Food selection*	7.91 ± 2.18	5.13 ± 2.48
Burden*	7.85 ± 2.03	4.88 ± 2.18
Mental health*	20.00 ± 4.30	13.54 ± 6.03
Social functioning*	20.40 ± 4.40	12.31 ± 6.31
Fear*	13.88 ± 3.61	8.70 ± 4.30
Eating duration*	5.77 ± 0.59	4.52 ± 1.78
Eating desire*	7.91 ± 1.03	5.68 ± 2.50
Communication*	7.20 ± 2.39	4.38 ± 2.19
Sleep	6.42 ± 2.37	5.47 ± 2.45
Fatigue*	8.68 ± 2.69	6.27 ± 3.15
Total score*	110.93 ± 39.90	159.40 ± 24.60

\*p<0.05; Values are mean SWAL-QOL scale scores ± SD.

SWAL-QOL: swallow-quality of life questionnaire

The Swallowing Function Test (SFT) is a clinical examination developed for stroke patients based on the Rasch model<sup>13</sup>). The SFT consists of 17 items in four categories, measured on a three-point scale with a higher score indicating a higher level of swallowing function. Scores less than 37 points indicate aspiration. The test has been found to be both sensitive and specific (94.28% and 90.90%, respectively)<sup>14</sup>). The SWAL-QOL is a self-report questionnaire developed for dysphagia patients<sup>5</sup>). The SWAL-QOL consists of 44 items in 11 categories. The scoring structure is the 5-point Likert scale: one point for strongly agree, two points for agree, three points for neutral, four points for disagree, and five points for strongly disagree. The total score ranges from 44 points at the minimum to the maximum; a higher score indicates a higher QOL. The reliability of the SWAL-QOL is 0.85 and the validity is 0.95<sup>5</sup>). All participants were evaluated by using the SFT and SWAL-QOL. The participants were classified into the oral intake (OI) group (n=44) if they scored of 37 points or more on the SFT and the non-oral intake (NOI) group (n=35) if they scored 36 points or less on the SFT.

All analyses were conducted using SPSS for Window version 18.0. For the general characteristics of the subjects, descriptive statistics were used. An independent t-test was used to compare each item in the SFT and SWAL-QOL for each group. To test statistical significance, p-values less than 0.05 were considered significant.

## RESULTS

The difference in the detailed SFT items between the two groups is presented in Table 2. There were significant differences in all items, except for the respiratory item and mean total score, between the OI group and the NOI group. The differences in SWAL-QOL responses are presented in Table 3. There were significant differences in all items, except for the sleep category and mean total score, between the OI group and the NOI group.

## DISCUSSION

Eating is the ability to keep, chew, and swallow bolus in one's mouth and function is more than that of satisfying basic needs and simply eating<sup>15</sup>). Therefore, the QOL of stroke patients with dysphagia is influenced by an inability to meet basic human needs<sup>16</sup>).

This study found a significant association between the swallowing function and QOL according to the oral intake level of stroke patients with dysphagia. The OI group showed a significantly higher level of swallowing function in all items, except for the respiratory item, in the SFT. Therefore, participants who are able to perform oral intake have better swallowing functions than participants who are unable to perform oral intake. The OI group reported a significantly higher QOL in all items, except for the sleep category, than the NOI group. In other words, both swallowing function and QOL were higher in the OI group. These results suggest that as the swallowing function improves, QOL increases. Additionally oral intake may be associated with QOL because it satisfies basic human needs.

Maslow's original hierarchy of needs is a motivational theory, which classifies human needs into five levels<sup>17</sup>). Physiological needs are at the lowest level and are considered to be the most fundamental needs, those that need to be satisfied before progressing to higher level needs. Stroke patients with dysphasia demonstrate low motivation and QOL due to a difficulty in meeting a basic physiologic need: eating. Thus, it is expected that oral intake treatment for stroke patients with dysphagia will have a positive effect on the swallowing function and QOL. Additionally, the rehabilitation motivation of the patients may be increased when a modified diet reflecting the patients' needs on oral intake is provided.

One limitation is that only stroke patients were included in the present study. Therefore, the results may not be generalized to patients with dysphagia caused by other diseases. Additionally, the analysis was limited to the ability for oral intake and did not consider the effect of any specific type of oral diet. In the future, research on the QOL of patients with dysphagia caused by various diseases, as well as the effect of the type of oral intake on QOL, should be pursued.

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