

Effect of Dysarthria Rehabilitation Training on Dysphagia

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Objective

Dysphagia and dysarthria are common complications after stroke. In many stroke patients, dysphagia and dysarthria co-occur frequently. Because many oral, pharyngeal and laryngeal structures are used in the process of both speech and swallowing, there could be a certain association between the management of dysphagia and dysarthria. Several studies have established relationship between dysphagia and dysarthria, however, there are no study investigating whether rehabilitation of dysphagia or dysarthria can improve each other. The aim of this study was to investigate the effect of dysarthria rehabilitation training on dysphagia in post-stroke patients.

Methods

A quasi-experimental study was performed on participants who were admitted to department of physical medicine and rehabilitation. Inclusion criteria were as follow: 1) first stroke attack (diagnosed within 6 months); 2) proper cognitive function (Mini Mental State Examination ≥ 18); 3) dysphagia was confirmed by videofluoroscopic swallowing study (VFSS); 4) dysarthria was diagnosed using alternating motion rate (AMR), sequential motion rate (SMR). AMR and SMR, screening test of dysarthria, evaluate articulatory diadochokinesis and have age specific cut-off value. All participants were divided into two groups; dysarthria-dysphagia rehabilitation group and only dysphagia rehabilitation group. Two groups underwent 30 minutes dysphagia training, 5 times a week for 3 weeks. In addition to dysphagia training, dysarthria-dysphagia rehabilitation group underwent 40 minutes dysarthria rehabilitation training, twice a week for 3 weeks. VFSS was performed before and after the intervention and degree of dysphagia was assessed by American Speech-Language-Hearing Association National Outcome Measurement System (ASHA-NOMS), Clinical Dysphagia Scale (CDS), New VFSS Scale.

Results

Total 10 post-stroke patients with dysphagia and dysarthria were enrolled. 5 patients were allocated to dysarthria-dysphagia rehabilitation group (DD) and 5 patients were allocated to only dysphagia rehabilitation group (OD). There was no significant difference in demographic characteristics between two groups. Changes between before and after intervention were 1.5 ± 0.5 (ASHA-NOMS), 21.6 ± 14.0 (CDS), 18.1 ± 8.2 (New VFSS scale) in DD group and 3.0 ± 1.0 (ASHA-NOMS), 9.6 ± 10.5 (CDS), 5.8 ± 3.2 (New VFSS scale) in OD group, respectively (Table 1,2,3). CDS and New VFSS scale showed significant improvement between before and after intervention in DD group ($p=0.043$, respectively),

however, not in OD group. Also, there was significant difference between two groups in New VFSS scale ($p=0.009$).

Conclusion

Dysarthria rehabilitation training may be helpful to enhance swallowing function in stroke patients. However, larger sample size will be needed to clarify these Results.

Table 1. American Speech-Language-Hearing Association National Outcome Measurement System(ASHA-NOMS) before and after intervention

Variable	Group	Pre	Post	P-value*	Δ (Post - Pre)	P-value†
Score	DD	5.5±0.5	7.0±0.0	0.063	1.5±0.5	0.267
	OD	3.0±2.0	6.0±0.0	0.180	3.0±1.0	

DD, dysarthria-dysphagia rehabilitation group; OD, only dysphagia rehabilitation group

Data were reported as mean±standard deviation.

* P-values were calculated by Wilcoxon's signed-rank test.

† P-values were calculated by Mann-Whitney test.

Table 2. Clinical Dysphagia Scale (CDS) before and after intervention

Variable	Group	Pre	Post	P-value*	Δ (Post - Pre)	P-value†
Score	DD	24.6±13.2	3.0±2.4	0.043	-21.6±14.0	0.073
	OD	21.6±11.8	12.0±2.4	0.066	-9.6±10.5	

DD, dysarthria-dysphagia rehabilitation group; OD, only dysphagia rehabilitation group

Data were reported as mean±standard deviation.

* P-values were calculated by Wilcoxon's signed-rank test.

† P-values were calculated by Mann-Whitney test.

Table 3. New Videofluoroscopic Swallowing (VFSS) Scale before and after intervention

Variable	Group	Pre	Post	P-value*	Δ (Post - Pre)	P-value†
Score in oral phase	DD	8.4±4.0	5.8±2.5	0.042	-5.6±2.1	0.014
	OD	7.4±3.0	5.8±2.4	0.102	-1.6±1.4	
Score in pharyngeal phase	DD	28.4±16.3	12.0±7.0	0.043	-12.5±6.6	0.028
	OD	35.2±12.7	31.0±13.9	0.066	-4.2±2.9	
Total score	DD	36.8±20.0	14.8±8.8	0.043	-18.1±8.2	0.009
	OD	42.6±12.9	36.8±13.6	0.066	-5.8±3.2	

DD, dysarthria-dysphagia rehabilitation group; OD, only dysphagia rehabilitation group

Data were reported as mean±standard deviation.

* P-values were calculated by Wilcoxon's signed-rank test.

† P-values were calculated by Mann-Whitney test.