

## Diagnosics and Treatment of Neurogenic Dysphagia after Carotid Stroke

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**Received:** October 19, 2019; **Published:** November 07, 2019

### Abstract

In the clinical picture of ischemic stroke, dysphagia is considered to be the most frequent life-threatening complication. Complications of dysphagia are aspiration, airway obstruction, pneumonia, dyshidria, malnutrition etc. Dysphagia can appear in combination with vocal and cognitive disorders. When restoring swallowing control functions and determining therapy tactics, it is important to provide adequate nutrition of patients with neurogenic dysphagia.

**Keywords:** Stroke; Dysphagia; MASA Scale; Swallowing Control; Larynx Mobility; Choline Alfoscerate; Succinate Acid; Combined Treatment

### Introduction

The research was conducted to determine the efficacy of post-stroke dysphagia treatment by choline alfoscerate (ChA), succinate combination (SC), and their combination with sip, larynx and swallowing exercises.

### Materials and Methods

The study involved 80 patients of both genders (average age of 62 years  $\pm$  7.2 years) with primary carotid ischemic stroke. Four groups of patients were randomized, comparable by gender, age, stroke severity, and degrees of dysphagia (Table 1). Treated groups received pharmacological support of logotherapy: ChA 14 mg/kg (2<sup>nd</sup> gr.), SC 0.5 mg/kg in terms of succinate (3<sup>rd</sup> gr.), and a combination of the two compounds (4<sup>th</sup> gr.). Controls (1st group) received a placebo. For an integrative assessment of swallowing function, a modified scale was used (Mann assessment of swallowing ability - MASA) [8], with the help of which the swallowing components and the degree of dysphagia were quantified, its development mechanisms were revealed, and risk of aspiration complications determined.

Index	First (n = 18)	Second (n = 20)	Third (n = 20)	Forth (n = 22)
Gender m/f, %	32.5/67.5			
Age, years	62+/- 7.2			
IS in the left segment of the middle cerebral artery, %	82.5%	60%	70%	70%
IS in the right segment of the middle cerebral artery, %	17.5%	40%	30%	30%
Overall MASA performance (n=10)	3.03 $\pm$ 0.3	2.9 $\pm$ 0.3	2.9 $\pm$ 0.4	4.0 $\pm$ 0.3

**Table 1:** Characteristics of diagnosed patients

MCA: Middle Cerebral Artery.

### Results and Discussion

The differences were significant and observed on the 5<sup>th</sup> day of treatment. ChA mostly improved sip control, and larynx mobility (38% above controls;  $p < 0.1$ ), while SC improved the closure of vocal cords (55% above controls;  $p < 0.1$ ). This may reflect the differences in synaptic control of these functions. Combined treatment was more effective than monotherapy: 15% above ChA, 15% above SC for swallowing function ( $p = 0.01$ ), 33% and 22% for vocal closure, 37% ( $p = 0.05$ ) and 76% ( $p = 0.01$ ) for larynx mobility, which may be due to synergism between two medications [1-4].

### Conclusion

Sip, larynx, and swallowing exercises with pharmacological support of ChA and SC ameliorated dysphagia after IS. SC solely mostly affected the larynx mobility indicator, while ChA affected vocal cord closure. Pharmacodynamics analysis allows us to assume that the prescription of ChA and SC could give a summation effect for restoration of swallowing functions for patients with post-stroke dysphagia. Thus, neurogenic post-stroke dysphagia treatment with intravenous induction of ChA and SC as monotherapy in a dosage of 0.5 mg/kg in terms of succinate and 14 mg/kg respectively improves swallowing functions. Prescription of SC mostly affects larynx mobility, and ChA mostly affects vocal cord closure. Combined pharmacotherapy restores sip control, and vocal cord closure is more efficient by 2.2 times, 1.7 times, and 1.6 times compared to the controls.

### Conflict of Interest

Authors declare that they have no financial interest or any conflict of interest exist.

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**Volume 8 Issue 12 December 2019**

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