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Brief Communication
Comunicação Breve

Functional development of swallowing in ICU patients with COVID-19

Evolução funcional da deglutição em pacientes com COVID-19 internados em UTI

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ABSTRACT

Purpose: to describe de functional development of swallowing in Intensive Care Unit (ICU) patients with COVID-19, who were submitted to a swallowing intervention. **Methods**: participants of the study were 77 patients (both gender, mean age 53.4±15.9; score on the Glasgow Coma Scale ≥14 and stable respiratory condition). The functional scale of swallowing used for assessment was the American Speech-Language-Hearing Association National Outcome Measurement System (ASHA NOMS). **Results**: the results indicate that there was a significant recovery of the functional swallowing patterns when comparing the measurements pre and post swallowing intervention. **Conclusion**: 83% of the patients needed up to 3 swallowing interventions to recover a safe swallowing pattern.

RESUMO

Objetivo: descrever a evolução funcional da deglutição em pacientes com COVID-19 submetidos à intervenção fonoaudiológica na Unidade de Tratamento Intensivo (UTI). **Método**: participaram do estudo 77 pacientes (ambos os gêneros; idade média 53.4±15.9; escore na Escala de Coma de Glasgow ≥14; e condição respiratória estável). A escala funcional utilizada para a avaliação da deglutição foi a *American Speech-Language-Hearing Association National Outcome Measurement System* (ASHA NOMS). **Resultados**: os resultados indicam que houve recuperação significativa nos padrões funcionais da deglutição na comparação pré e pós-intervenção fonoaudiológica. **Conclusão**: 83% dos pacientes necessitam de até 3 intervenções para a recuperação dos padrões seguros de deglutição.

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INTRODUCTION

Patients admitted to intensive care due to Coronavirus Disease (COVID-19) (severe respiratory syndrome caused by the SARS-CoV-2 virus), often require intubation and prolonged mechanical ventilation[1,2]. Recent studies indicate that these patients may present damage to the central and peripheral nervous system as a direct result of the virus or due to the innate and adaptive immune response to infection[3]. Patients, whether due to prolonged intubation or neurological damage, are at high risk of oropharyngeal dysphagia[4-8].

The presented report comprises a prospective observational study, of 12 months, on the impacts of COVID-19 on the swallowing of patients admitted to the Intensive Care Unit (ICU), submitted to prolonged orotracheal intubation (≥48h)[8]. The purpose of this report is to describe the functional progress of patients' swallowing for safe return to oral feeding, submitted to speech-language therapy intervention in the ICU.

METHODS

This survey was composed of 77 patients (both genders; mean age 53.4 ± 15.9), during the first 4 weeks of speech-language therapy in the ICU/COVID-19 in a large hospital. The project was approved by the institutional ethics committee and includes consent for participation and disclosure of data (CAPPesq Report no. 3,992,554). All participants were informed of the research objective and procedures, and signed the Free and Informed Consent Form.

The patients included in the study were those referred by the medical team (Glasgow Coma Scale ≥14 and stable respiratory condition) for evaluation and recovery of swallowing capacity. The functional scale used was the American Speech-Language-Hearing Association National Outcome Measurement System (ASHA NOMS)[9]. The ASHA NOMS for swallowing is a multifunctional instrument that indicates the degree of swallowing impairment on a scale from 1 (necessary to use an alternative feeding route) to 7 points (fully functional).

RESULTS

The collected data were submitted to statistical analysis using the IBM SPSS software version 25. The analyzes presented are intragroup, comparing the results obtained before and after the speech-language therapy intervention, using Pearson's chi-square test. The level of significance adopted was 5% (Table 1). The number of treatment units was also considered (each unit corresponds to 40 to 50 minutes of stimulation) until the patient was allowed for the oral administration (Table 2). The most used techniques for the rehabilitation of swallowing were: Coaptation and glottal vibration; isometric orofacial exercises.

Table 1. Progress of the functional level of swallowing using the ASHA NOMS scale

Level	Definition	Initial Result		Final Result		*p*-value
		Number of cases	Total in each level	Number of cases	Total in each level	
Level 1 and 2	The individual is not able to swallow anything safely by mouth. Almost all nutrition and hydration are received by an alternative method of feeding (eg: nasogastric tube, gastrostomy).	7	9.1%	0	0	*<0.001**
Level 3	Alternative method of feeding is necessary, since the individual ingests less than 50% of the nutrition and hydration through the mouth; and/or swallowing is safe with the moderate use of clues to use compensatory strategies; and/or requires maximum diet restriction.	7	9.1%	0	0	*<0.001**
Level 4	Swallowing is safe, but often requires moderate use of clues to use compensatory strategies; and/or the individual has moderate dietary restrictions; and/or still need tube feeding and/or oral supplement.	22	28.6%	1	1.3%	*<0.001**
Level 5	Swallowing is safe with minimal dietary restrictions; and/or occasionally requires minimal leads to use compensatory strategies. You can occasionally monitor yourself. All nutrition and hydration are received by the mouth during the meal.	21	27.3%	5	6.5%	*0.001**
Level 6	Swallowing is safe and the individual eats and drinks independently. It rarely requires minimal clues to use compensatory strategies. It is often self-monitoring when difficulties occur. It may be necessary to avoid certain specific food items (eg, popcorn and peanuts); additional time for feeding may be necessary (due to dysphagia).	9	11.7%	18	23.4%	*0.020**
Level 7	The individual's ability to feed independently is not limited by the swallowing function. Swallowing is safe and efficient for all consistencies. Compensatory strategies are used effectively when necessary.	11	14.3%	53	68.8%	*0.016**

Table 2. Progress of the functional level of swallowing using the ASHA NOMS scale

		Total number of participants (percentage)
Number of treatment units until the patient is allowed for oral administration	1	16 (20.8%)
	2	21 (27.3%)
	3	19 (24.7%)
	4	8 (10.4%)
	5	7 (9.1%)
	6	1 (1.3%)
	7	4 (5.2%)
	8	0 (0.0%)
	9	1 (1.3%)

DISCUSSION

There is a bibliographic basis indicating that patients with severe manifestations of COVID-19 may present, in addition to respiratory conditions that require prolonged intubations, neurological, central and peripheral sequelae[1-3]. The complex conditions of these patients can be caused by the direct action of the virus or by the immune response to infection[10]. Longitudinal monitoring of these patients is an attempt to reduce disabilities and the need for long-term care[11,12]. Oropharyngeal dysphagia in an intensive care setting is still poorly studied, but it is frequently reported as a common symptom in several complex health conditions[13].

In a pandemic condition, it is even more important that the bedside swallowing assessment protocols are applied, since endoscopic procedures are potentially infectious aerosol generators and, therefore, not recommended[14]. The clinical authorization of the patient for oral feeding, without speech-language assessment of swallowing, of patients with COVID-19, as indicated by the data of this research, is of high risk for these patients, since almost 20% of the patients do not have conditions minimum safe food and approximately 29% of these patients need compensatory strategies and dietary restrictions for the function of swallowing to be performed. The data of this research also indicate that the vast majority of patients (72.8%) need up to 3 speech-language therapy interventions to recover swallowing, that is, the early intervention of swallowing rehabilitation promotes the quicker removal of the patient from the ICU.

Complications in swallowing skills, in non-COVID-19 situations, imply an increase of up to 4 times in patients' hospitalization time; lead to malnutrition; dehydration; and aspiration pneumonia. It is expected that, for patients with COVID-19, whose respiratory condition is severe, there may be an even greater risk of complications[8]. There are a number of new physical conditions (long immobilization in the pronated position, muscle weakness, fatigue, etc.) and mental conditions (isolation from family, work, etc.) that must be followed even after the patient has reached a safe functional level for swallowing[4,12].

CONCLUSION

The results indicate that there was a significant recovery in the functional patterns of swallowing in the comparison before and after speech-language therapy intervention. There is information that 83% of patients need up to 3 interventions to recover safe swallowing patterns.

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Author contributions

MSL and GCM were responsible for the collection, data analysis, initial writing and article review; FCS was responsible for the data analysis and writing of the final version and review of the article; APR was responsible for the data analysis and interpretation; CRFA was responsible for the project design, writing the final version and revising the article.