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SPEECH THERAPY REHABILITATION IN VICTIMS OF SPINAL CORD TRAUMA WITH OROPHARYNGEAL DYSPHAGIA

REABILITAÇÃO FONOAUDIOLÓGICA EM VÍTIMAS DE TRAUMA RAQUIMEDULAR COM DISFAGIA OROFARÍNGEA

Jaqueline Gonçalves dos Santos Rocha [1]
Ana Catarina Moura Torres [2]

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Abstract
Objective: to describe the rehabilitation strategies and techniques used and the effects of the speech therapy approach in dysphagic patients victims of spinal cord trauma. **Method:** this is a retrospective and documentary study. Data collection was performed through documentary analysis, from July to December 2019. Included were individuals admitted and followed up by the speech therapy service of a reference hospital in trauma in the state of Bahia, with oropharyngeal dysphagia, without compromising the system central nervous system or during the traumatic event. The data collected were tabulated in the Excel program (Version 2007), a descriptive statistical analysis was performed, and the variables were described by absolute frequency. **Results:** as a therapeutic method, in the group of tracheostomized subjects, indirect and direct therapy was used in 100% of the sample. In the group of non-tracheostomized subjects, direct therapy was predominant. Most of the sample had their oral diet already released in the speech-language evaluation, except for tracheostomized individuals, as they presented severe dysphagia at the beginning of rehabilitation. Most of the subjects in the group of non-tracheostomized patients were already on an oral diet when admitted by speech therapists. Oral feeding was the main result in all individuals and decannulation among tracheostomized subjects. **Conclusion:** The strategies and techniques used for rehabilitation through indirect and direct therapy contributed to the removal of SNE, progression of oral diet and decannulation in this population, as well as reducing the risks of clinical problems such as bronchoaspiration, demonstrating therapeutic efficacy.

Keywords: Spinal cord trauma; Traumatic spinal cord injury; Oropharyngeal dysphagia; Swallowing alteration; Speech therapy rehabilitation.

[1] Multiprofessional Residency in Health and Bachelor's Degree in Speech Therapy by the State University of Bahia.
ORCID: https://orcid.org/0000-0002-0762-7549
E-mail: jgrkely@gmail.com
[2] Doctoral student in Interactive Processes of Organs and Systems and Master in Food, Nutrition and Health at the Federal University of Bahia. Professor at the State University of Bahia.
ORCID: https://orcid.org/0000-0002-3529-8287
E-mail: anacathi@hotmail.com

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Resumo
Objetivo: descrever as estratégias e técnicas de reabilitação utilizadas e os efeitos da abordagem fonoaudiológica em pacientes disfágicos vítimas de trauma raquimedular. **Método:** trata-se de um estudo retrospectivo e documental. A coleta dos dados foi realizada através de análise documental, no período de julho a dezembro de 2019. Foram incluídos indivíduos admitidos e acompanhados pelo serviço de fonoaudiologia de um hospital referência em trauma do estado da Bahia, portadores de disfagia orofaringea, sem comprometimento do sistema nervoso central prévio ou durante o evento traumático. Os dados coletados foram tabulados no programa Excel (Versão 2007), realizada análise estatística descritiva e as variáveis descritas por frequência absoluta. **Resultados:** como método terapêutico, no grupo dos sujeitos traqueostomizados, foi utilizada a terapia indireta e direta em 100% da amostra. Já no grupo dos sujeitos não traqueostomizados foi predominante o uso da terapia direta. A maioria da amostra teve a dieta oral liberada já na avaliação fonoaudiológica, exceto os indivíduos traqueostomizados, por apresentarem disfagia grave no início da reabilitação. A maior parte dos sujeitos do grupo dos não traqueostomizados já estava com dieta oral liberada quando admitidos pelos fonoaudiólogos. A alimentação por via oral foi o principal resultado em todos os indivíduos e a decanulação entre os sujeitos traqueostomizados. **Conclusão:** As estratégias e técnicas utilizadas para a reabilitação através da terapia indireta e direta contribuiu para retirada de SNE, progressão de dieta oral e decanulação nessa população, assim como reduziu os riscos de agravos clínicos como a broncoaspiração, demonstrando eficácia terapêutica.

Palavras-chave: Trauma raquimedular; Lesão medular traumática**;** Disfagia orofaríngea**;** Alteração de deglutição; Reabilitação fonoaudiológica.

INTRODUCTION

Spinal cord trauma (SCI) occurs when there is damage to the spinal nerve tissue due to a traumatic mechanism affecting vertebral bodies by any type of injury to the spinal cord, resulting from compression, injury or laceration of the structure[1,2]. It is characterized by the partial or total interruption of the neurological signal resulting in motor and sensitivity loss from the level of the lesion downwards, including alterations in the genitourinary, intestinal and autonomous systems[2]. TRM can cause not only important physical sequelae, but also psychological and social repercussions[1,3]. It is important to determine or identify the anatomical location of the lesion through clinical examination performed by qualified professionals, as the location is directly related to the trauma mechanism and helps to understand the injuries and sequelae resulting from spinal cord trauma[1].

According to the Ministry of Health, in 2015, epidemiological data regarding the incidence of spinal cord trauma is about 6,000 to 8,000 new cases per year, 80% of the victims are male and 60% are in the age group between 10 and 30 years of age[4,5].

The main causes of TRM in Brazil are traffic accidents (car and motorcycle), firearm perforations (PAF), assaults, falls, diving in shallow water, among others[5,6,7]. Several studies mention pneumonia and other pulmonary complications as the most common cause of death among patients suffering from SCI, especially in the acute phase, resulting from laryngotracheal aspiration that in many cases occurs silently, that is, not detected only in the clinical evaluation speech therapy[3,8,9].

Laryngotracheal aspiration results from changes in the biomechanics of swallowing called oropharyngeal dysphagia. Studies carried out among patients with quadriplegia resulting from spinal cord injury showed that 40% of these patients have oropharyngeal dysphagia[10], which may occur due to a primary or secondary cause of spinal cord trauma, such as orotracheal intubation, soft tissue edema, involvement of peripheral nerves, surgery and tracheostomy[7,11].

The speech therapist can act using strategies and techniques such as consistency adaptation, swallowing maneuvers, compensatory exercises, surface electromyography, among other resources, aiming at the efficiency and safety of swallowing in diphagic individuals with traumatic spinal cord injury[7,12].

In view of the benefits that the speech therapy approach can bring to dysphagic patients with spinal cord trauma and given the scenario of little national evidence on this topic, the description of speech therapy activities for this population is relevant. Therefore, this work aims to describe the rehabilitation strategies and techniques used and the effects of the speech therapy approach in dysphagic patients victims of spinal cord trauma.

METHOD

This is a retrospective and documentary study. This research was approved by the Ethics and Research Committee of the University of the State of Bahia (UNEB), under approval number 3.908.169 and CAAE 29473619.60000.0057. The Free and Informed Consent Form - TCLE was waived.

Data collection was carried out through document analysis of the existing information in the database of the speech therapy service of the reference hospital in trauma in the state of Bahia. Data collection was carried out from July to December 2019. The sample consisted of patients with spinal cord trauma (SCI), of both genders, aged over 12 years, patients with oropharyngeal dysphagia, admitted and monitored by the service speech therapy at the hospital, without previous central nervous system involvement or during the traumatic event. Patients with previous dysphagia, those with incomplete information in the database and deaths were excluded from the research.

The clinical, speech-language and demographic data of the participants were collected using a collection form prepared by the researcher as an instrument (**Appendix 1**). Data regarding age, gender, length of stay (in days), time of speech therapy (in days), level of injury, as well as the degree of involvement of the spinal cord injury - based on the neurological injury classification protocol, were obtained American Spinal Injury Association[13] and Frankel scale[13] (**Chart 1**), causes of spinal trauma, need and duration of mechanical ventilation via orotracheal intubation (in days), need and duration of mechanical ventilation via tracheostomy (in days), type of tracheostomy and duration of use (in days), Blue Dye Test (BDT) and Modified Blue Dye Test (BDTM) results (positive or negative) - resource used to assess the presence of salivary and food aspiration in the patient tracheostomized[14], therapeutic objectives, speech therapy methods, decannulation time (time interval from speech therapy admission to decannulation), Functional Scale of Oral Ingestion (Functional Oral Intake Scale - FOIS) (**Table 1**) initial and final - allows evaluating the effectiveness of speech therapy in oral rehabilitation, food consistency released in the first assessment and

in the last visit[15] and food consistency released in the speech therapy assessment and at the end of the intervention.

The variable referring to the speech therapy method sought to describe the techniques and therapeutic strategies used. They were classified into two groups: direct therapy – occurs with the use of food, aiming to rehabilitate the function of swallowing, using changes in consistencies, volume and utensils, postural changes and swallowing maneuvers; and indirect therapy – without the use of food, using techniques aimed at reestablishing the mobility and sensitivity of the structures involved in the swallowing process, through sensory stimulation, exercises for oral, pharyngeal and laryngeal control[16,17].

To analyze the results, the sample was divided into two groups: tracheostomized and non-tracheostomized patients.

The collected data were tabulated in Excel (Version 2007) and descriptive statistical analysis was performed. Variables were described by absolute frequency. The analyzed results were described and displayed in tables and figures.

Chart 1. ASIA/Frankel Scale – classification of the degree of involvement of the spinal cord injury based on the neurological picture [13].

Frankel	Nomenclature	Clinical feature
A	Complete	There is no motor or sensory function in sacral segments S4-S5
B	Incomplete sensory	Preservation of sensitivity and loss of motor strength below the neurological level, extending to the sacral segments S4-S5.
C	Incomplete engine	Motor function is preserved below the neurological level, and most key muscles below the neurological level are less than or equal to 3.
D	Incomplete engine	Motor function is preserved below the neurological level and most key muscles below the neurological level have a grade greater than or equal to 3.
E	Ordinary	Sensitivity and normal motor strength.

RESULTS

For data collection, records of n=50 patients were analyzed and n=38 of them were excluded. Of those excluded, n=15 had TBI associated with TRM, n=8 for having a fractured vertebra, but no report of spinal cord injury, n=8 with incomplete information regarding follow-up time and speech therapy findings, n=6 with neurological diseases previous n=1 patient with a history of dysphagia prior to traumatic injury. The sample consisted of n=12 subjects. The median age was 34.5 years, with ages ranging between 17 and 59 years. All individuals were male.

Regarding the cause of spinal cord trauma, it was possible to observe that n=7 had no records as to the cause, n=2 had occurrences of perforation by firearm (PAF), n=2 by motorcycle accident and n=1 by fall of the own height.

With regard to length of stay, only 16.66% (n=2) of the sample had this record, with a minimum period of 36 days and a maximum of 53 days.

As for the time of speech therapy follow-up, the minimum time was 2 days and the maximum was 28 days, with a median equal to 5 days. The median time of speech therapy follow-up for the group of tracheostomized subjects was 17 days and 3.5 days for non-tracheostomized subjects.

With regard to the level of injury, 5 subjects had injuries at the cervical level between C3 and C7, 3 had injuries covering cervical and thoracic levels, between C1 and T9, 3 had injuries only at the thoracic level, between T1 and T5, and 1 had lesions at the lumbar and sacral level, L1 and S4. As for the degree of impairment of the spinal cord injury according to Frankel's classification, no records were found of the degree of impairment of 8 subjects, 3 had grade A – complete injury and 1 grade D – functional motor preservation.

With regard to orotracheal intubation (OTI), only 4 subjects underwent the procedure, with a median of 9 days, minimum time of 1 day and maximum time equal to 14 days in OTI.

The tracheostomy was performed in 4 individuals. As for the time of use, 1 subject had no record, the others had a time of 20, 26 and 39 days, with a median of 26 days.

Regarding mechanical ventilation (MV) via tracheostomy, 3 subjects remained on MV via TQT for 3 days and 1 for 14 days.

The Blue Dye Test (BDT) was positive in 100% of the sample in the first evaluation. In the first modified Blue Dye Test (BDTM) performed for semi-liquid, after the beginning of the therapies, 100% of the subjects had a negative result. The first BDTM for thin liquid, also after the beginning of the interventions, showed 50% of the results positive, 25% negative and 25% did not perform the test.

The therapeutic objectives, in the group of tracheostomized subjects, were reintroduction of oral diet (100%), optimize swallowing biomechanics (50%), optimize salivary swallowing (75%), decannulation (75%) and change from cannula to metallic (25%). Among non-tracheostomized subjects: progression of food consistency (87.5%), reintroduction of oral diet (25%) and oral management (50%).

As a therapeutic method, in the group of tracheostomized subjects, indirect therapy (**Figure 1**) and direct therapy (**Figure 2**) were used in 100% of the sample. In the group of non-tracheostomized subjects, the use of direct therapy was predominant (**Figure 2**).

Figure 1. Therapeutic method: description and occurrences of strategies and techniques applied during indirect therapy in the group of tracheostomized subjects.

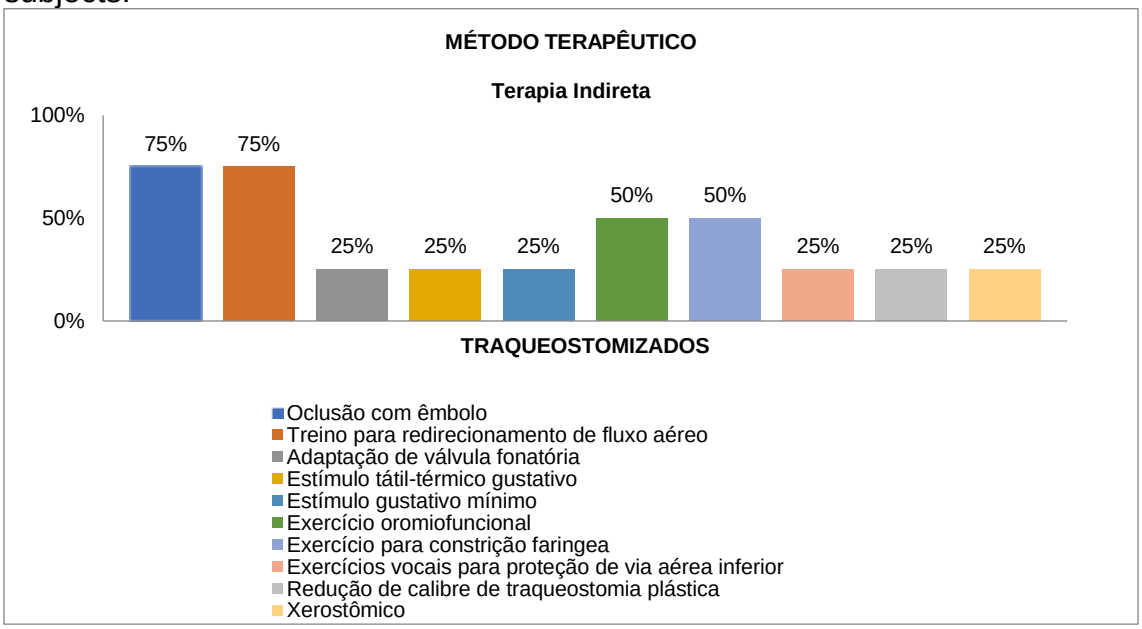
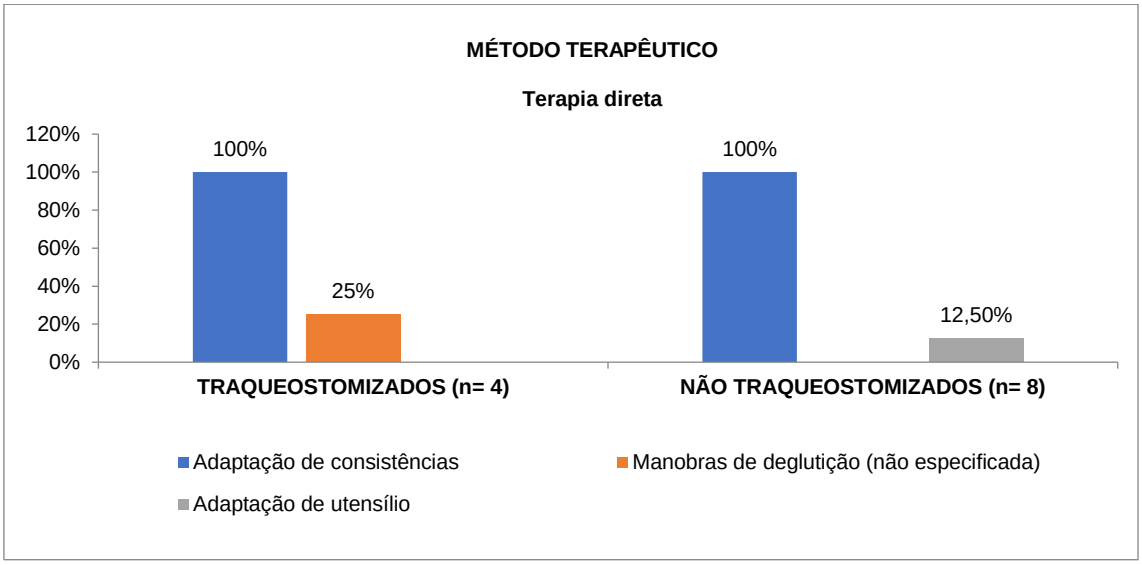


Figure 2. Therapeutic method: description and occurrences of strategies and techniques applied during direct therapy in the group of tracheostomized and non-tracheostomized subjects.



In the group of tracheostomized subjects (n=4), all were admitted for speech therapy with a plastic TQT cannula with an inflated cuff. Of these, 50% switched to the metallic TQT cannula during follow-up and 75% of them were decannulated. The absence of medical criteria made it impossible to decannulate 25% of this group.

As for the decannulation time, subject 1 decannulated within 14 days of speech therapy, subject 2 within 15 days and subject 3 within 21 days. All were already with an exclusive oral route. There was no discrepancy in the decannulation time between the subjects who exchanged the cannula for a metallic one, compared to those who did not undergo it. After decannulation, subject 1 remained in speech therapy for 1 day, subject 2 remained for 4 days and subject 3 for 7 days.

In the comparison between the level of oral intake and food consistencies released in the speech evaluation and at the end of the intervention, it was shown that more than 50% of the sample was discharged from speech therapy with total oral route without restrictions (FOIS 7), as indicated in the results in **Table 1**.

Data regarding the level of spinal cord injury, swallowing changes and time of speech therapy are described in **Table 2**.

As for the variable corresponding to the classification of the degree of dysphagia, according to the Risk Assessment Protocol for Dysphagia (PARD)(16), it was removed from the study due to the lack of information in the database.

Table 01. Comparison between level of oral intake and food consistencies released in the speech therapy evaluation and at the end of the intervention.

Variables	Initial		End	
	N	%	N	%
FOIS				
FOIS 1	6	50	0	0
FOIS 2	0	0	0	0
FOIS 3	0	0	1	8,33
FOIS 4	0	0	0	0
FOIS 5	2	16,66	1	8,33
FOIS 6	3	25	2	16,66
FOIS 7	1	8,33	8	66,66
Food consistency released				
LF e SL	2	16,66	0	0
LF, SL e SM	4	33,33	2	16,66
LF, SL e FM	1	8,33	0	0
LF, SL e PH	1	8,33	1	8,33
SL, SM e S	0	0	1	8,33
LF, SL, SM e S	0	0	8	66,66

Caption: N = number of occurrences; FOIS = Functional Oral Intake Scale – Level 1: Nothing orally; Level 2: Dependent on alternative route and minimal oral route of any food or liquid; Level 3: Dependent on alternative route with consistent oral route of food or liquid; Level 4: Total oral route of a single consistency; Level 5: Total oral use with multiple consistencies, but requiring special preparation or compensation; Level 6: Total oral use with multiple consistencies, but without the need for special preparation or compensation, but with dietary restrictions; Level 7: Total oral use without restrictions; LF = fine liquid; SL = semi-liquid; SM = soft solid; FM = soft fruit; PH = homogeneous pasty; S = solid.

Table 02. Description of the level of spinal cord injury, swallowing alteration and time of speech-language pathology follow-up

Groups	Participants	Level of Injury / Degree of Compromise	FOIS initial	Speech therapy follow-up time (days)
Tracheotomy	P1	T4 - T5	1	15
	P2	T1 - T4	1	12
	P3	C3/C4 e C5/C6	1	28
	P4	L1 + S4	1	19
Not tracheostomized	P5	C7 - T1	1	5
	P6	C6 - C7 (FRANKEL A)	7	2
	P7	C7 - T8	5	2
	P8	C1,C5,C7,T8 e T9 (FRANKEL A)	6	6
	P9	T4	5	4
	P10	C4 - C7	6	2
	P11	C6 - C7 (FRANKEL A)	1	5
	P12	C3 e C4 (FRANKEL D)	7	3

Caption: BDT = Blue Dye Test; FOIS = Functional Oral Intake Scale; C1, C3, C4,C5,C6 and C7 = cervical levels; T1, T4, T5, T8 and T9 = thoracic levels; L1 = lumbar level; S4 = sacral level.

DISCUSSION

Most of the sample had the oral diet released in the speech-language evaluation, except for the tracheostomized individuals, for presenting severe dysphagia at the beginning of rehabilitation. Most subjects in the non-tracheostomized group were already on an oral diet when admitted by the speech therapists. Oral feeding was the main result in all individuals and decannulation among tracheostomized patients.

Regarding age and gender, the results found are similar to other Brazilian studies, which indicate a higher occurrence of SCI in the age group between 10 and 30 years and in males around 80%[5,6]. Spinal cord traumas resulting from PAF and traffic accidents, especially those involving motorcycles, among subjects with this demographic profile, are among the main causes and have increased considerably over the years, reflecting the high level of urban violence, in addition to TRM by aggression and falls[5-7]. In the present research, there was a proximity between these variables.

As for the hospitalization time of a SCI victim, although there are few studies that discuss the subject, some national surveys found results for hospitalization time around one month[18] or above 100 days[19]. The hospital stay may vary according to the complexity and severity of the case, the longer the hospital stay, the greater the risk of clinical complications[18,19]. Thus, the period of hospitalization found in this research is close to the findings in the national literature.

With regard to the time of speech therapy, the difference between the follow-up period of tracheostomized and non-tracheostomized patients can be explained by the presence of greater changes due to exposure for a long time in mechanical ventilation[20] and by the presence of tracheostomy that can modify the swallowing biomechanics[1,10,21], demanding a longer period for reestablishment of the swallowing function. Studies show that individuals with dysphagia take a significantly longer period of time to start orally[10]. However, no studies were found

that report on the average length of speech therapy follow-up in patients with dysphagic spinal cord injury in a hospital environment.

Referring to spinal cord injury at the cervical level and degree of severe impairment, they are described as risk factors for dysphagia[7,11,12,22], diverging from the results of this study. Such divergence can be justified by the small sample size of this research. Oropharyngeal dysphagia in this population may also be related to other risk factors such as advanced age, nasogastric tube and tracheostomy[10], which may justify the occurrence of changes in the biomechanics of swallowing in subjects with SCI with lesions at lower levels.

Some authors[1,7,23] describe that oropharyngeal dysphagia in patients with SCI, in many cases, can be multifactorial, resulting from soft tissue edema, peripheral nerve damage, hematoma, esophageal displacement, head trauma associated with TRM , surgical complications, postoperative edema, in addition to positional problems due to excessive neck extension or low head.

Studies[24] indicate that the time of orotracheal intubation has an impact on the swallowing dynamic, reaching the mucosa, causing desensitization of the oropharyngeal and tracheal tracts due to the presence of the cannula and cuff, increasing the risk of dysphagia. Mechanical ventilation enhances changes in swallowing biomechanics due to mismatches in amplitude and tonicity of oropharyngeal structures[2)]. Most studies mention that a prolonged period of mechanical ventilation, greater than 48 hours, increases the chances of injury every hour[25].

As for the impact of tracheostomy on swallowing, the results obtained in the studied sample are similar to studies that consider tracheostomy as one of the predictors of oropharyngeal dysphagia in spinal cord trauma[1,11]. Tracheostomy is able to change the biomechanics of swallowing, offering a high risk of laryngotracheal aspiration due to factors such as reduced laryngeal mobility, loss of protective reflexes and change in propioception due to desensitization, decrease or absence of subglottic pressure, if cuff is inflated, and esophageal narrowing with risk of pressure injuries[1,10,21]. These changes justify the results of the BDT and BDTMs found in this research.

Regarding the tracheostomy time, no research was found that related the tracheostomy time in the subject with SCI. However, a review study conducted with a population with various underlying disorders such as neurological, oncological, facial trauma, cardiac, pulmonary disease, burns, among others, reported a mean TQT time of 35.5 days. Presenting a period similar to the tracheostomy time found in the present study[26].

The speech therapy objectives in this research were compatible with other studies[26,27] that describe its purpose. They are established to eliminate or reduce the risks of laryngotracheal aspiration and associated complications, enabling safe oral intake[27]. In the tracheostomized subject, decannulation is one of the main therapeutic objectives in order to reestablish the physiological biomechanics of swallowing[26].

As a therapeutic method, the strategies and techniques used by the therapists were compatible with those described by authors[8,9,12,28] who investigate patients with dysphagic traumatic spinal cord injury. Speech therapy intervention through exercises using neuromuscular electrical stimulation, oral motor exercises, exercises to strengthen the pharynx, thermal stimulation, among other possibilities, as well as tests with food or liquids associated with exercises and swallowing maneuvers before the introduction of complete diets are described in studies[12].

Still, regarding the therapeutic method, the most used therapeutic strategies in speech therapy intervention of swallowing in TRM, include the indication of tube feeding, modification of diet consistency and compensatory swallowing strategies[7].

As for the decannulation time, authors[26] found a mean decannulation time of 24.6 days. In the present study, the shorter median decannulation time can be explained by the efficiency of the applied techniques, the favorable general clinical condition, the tracheostomy time[26,29], or the relatively small sample size.

As it is a database of a sector, which contains information collected from medical records, some data were not recorded, a factor that limited the research by reducing its sample size and not clearly characterizing some variables. The exclusion from the research of subjects with TBI associated with the RT also contributed to the reduction in the sample size of the present study.

I suggest the production of more studies on the subject of research, with larger samples, in order to better describe the speech therapy practice in patients victims of spinal cord trauma and research comparing groups of individuals victims of SCI associated with TBI and not associated.

CONCLUSION

The present research concludes that the strategies and techniques used for rehabilitation through indirect therapy, such as training for airflow redirection, plunger occlusion and tactile-thermal taste stimulation, and direct therapy, such as the adaptation of consistencies and utensils, contributed to the removal of ENS, progression of oral diet and decannulation in this population, as well as reduced the risk of clinical problems such as bronchoaspiration, demonstrating therapeutic efficacy.

REFERENCES

1. Kirshblum S, Johnston MV, Brown J, O'Connor KC and Jarosz P. Predictors of dysphagia after spinal cord injury. Arch Med Rehabil 1999; 80: 1101–1105.

2. Mcdonald JW and Sadowsky C. Spinal-cord injury. Lancet, [S.l], v. 359, n. 9304, p. 417-25. Feb 2 2002.

3. Macedo FS, Paz CC, Rocha AF, Miosso CJ, Carvalhi HB & Mateus SR. Novas perspectivas de fisioterapia respiratória em lesão medular - uma revisão sistemática. Acta Paul Enferm. 2017; 30(5):554-64.

4. Brasil. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Ações Programáticas Estratégicas. Diretrizes de Atenção à Pessoa com Lesão Medular / Ministério da Saúde, Secretaria de Atenção à Saúde, Departamento de

Ações Programáticas Estratégicas e Departamento de Atenção Especializada. – 2. ed – Brasília : Ministério da Saúde, 2015.

5. Defino HLA. Trauma raquimedular. Medicina, Ribeirão Preto, 32: 388-400, out./dez. 1999.

6. Masini M. Estimativa da incidência e prevalência de lesão medular no Brasil. J Bras Neurocirurg 12(2): 97-100, 2001.

7. Valenzano TJ, Waito AA and Steele CM. Characterizing Dysphagia and Swallowing Intervention in the Traumatic Spinal Injury Population. Dysphagia. 2016 October ; 31(5): 598–609. doi:10.1007/s00455-016-9728-4.

8. Ihalainen T, Rinta-Kiikka I, Luoto TM, Koskinen EA, Korpijaakko-Huuhka A, Ronkainen A. Traumatic cervical spinal cord injury: a prospective clinical study of laryngeal penetration and aspiration. Spinal Cord. 2017;55:979–84.

9. Shin JC, Yoo JH, Lee YS, et al. Dysphagia in cervical spinal Cord injury. Spinal Cord. 2011;49:1008–13.

10. Shem K, Castillo K, Wong S and Chang J. Dysphagia in individuals with tetraplegia: incidence and risk factors. J Spinal Cord Med. 2011; 34: 85-92.

11. Brady, S, Miserendino R, Statkus D, Springer T and Hakel M. Vasilios Stambolis, MD. Predictors to Dysphagia and Recovery After Cervical Spinal Cord Injury During Acute Rehabilitation. The Journal of Applied Research • Vol. 4, No. 1, 2004.

12. Gordan W, Dale B, Brougham R, Spivack-David D, Georgeadis A, Adornato V, et al. Scirehab: The Speech language Pathology Taxonomy. J Spinal Cord Med 2009;32(3):306–17. DOI: 10.1080/10790268.2009.11760784.

13. American Spinal Injury Association. International standarts for neurological of spinal cord injury. [online]. Atlanta (US): American Spinal Injury Association; 2011. Disponsivel em: http://www.asia-spinalinjury.org/publications/59544_sc_Exam_sheet_r4.pdf.

14. Costa CC, Favero TC, Rosa FB, Steidl EMS & Mancopes R. Decanulação: atuação fonoaudiológica e fisioterapêutica. Distúrbios Comun. São Paulo, 28(1): 93-101, março, 2016.

15. Furkim AM & Sacco ABF. Eficácia da fonoterapia em disfagia neurogênica usando a Escala Funcional de Ingesta por via Oral (FOIS) como marcador. Rev CEFAC, São Paulo, v.10, n.4, 503-512, out-dez, 2008.

16. Padovani AR, Moraes DP, Mangili LD & Andrade CRF. Protocolo Fonoaudiológico de Avaliação do Risco para Disfagia (PARD). Rev Soc Bras Fonoaudiol. 2007;12(3):199-205.BARROS.

17. Najas M. (Coord.). I Consenso Brasileiro de Nutrição e Disfagia em Idosos Hospitalizados. 1 ed. Barueri, SP: Minha Editora, 2011.

18. Santos TSC, Guimarães RM & Boeira, S. F. Epidemiologia do trauma raquimedular em emergências públicas no município do Rio de Janeiro. Esc Anna Nery (impr.)2012 out - dez; 16 (4):747 – 753.

19. Viúdes MA A, Costa JM & Nunes CMP. Perfil dos pacientes internados por trauma raquimedular em hospital público de ensino. Rev Med Minas Gerais 2015; 25(3): 380-386. DOI: 10.5935/2238-3182.20150074.

20. Santana L, Fernandes A, Brasileiro AG & Abreu AC. Critérios para avaliação clínica fonoaudiológica do paciente traqueostomizado no leito hospitalar e internamento domiciliar. Rev. CEFAC. 2014 Mar-Abr; 16(2):524-536.

21. Eibling DE and Gross RD. Subglottic air pressure: a key component of swallowing efficiency. Ann Otol Rhinol Laryngol 1996;105(4):253–8.

22. Hayashi T, Fujiwara Y, Sakai H, Maeda T, Ueta T and Shiba K.Risk. Risk factors for severe dysphagia in acute cervical spinal cord injury. International Spinal Cord Society. Spinal Cord (2017) 55, 940–943.

23. Carucci LR, Turner MA, Yeatman CF. Dysphagia secondary to anterior cervical fusion: radiologic evaluation and findings in 74 patients. AJR Am J Roentgenol. 2015; 204:768–775.

24. Barros AB, Portas JG & Queija DS. Implicações da traqueostomia na comunicação e na deglutição. Rev. Bras. Cir. Cabeça Pescoço, v. 38, nº 3, p. 202 – 207.2009.

25. Sassi FC, Medeiros GC, Zambon LS, Zilberstein B & Andrade CRF. Avaliação e classificação da disfagia pós-extubação em pacientes críticos. Rev. Col. Bras. Cir. vol.45 no.3 Rio de Janeiro 2018. DOI: 10.1590/0100-6991e-20181687.

26. Medeiros GC, Sassi FC & Lirani-Silva C. Claudia Regina Furquim de Andrade2. Critérios para decanulação da traqueostomia: revisão de literatura. CoDAS 2019;31(6):e20180228 DOI: 10.1590/2317-1782/20192018228.

27. Silva RG. A eficácia da reabilitação em disfagia orofaríngea. Pró-Fono Revista de Atualização Científica, Barueri (SP), v. 19, n. 1, p.123-130, jan.-abr. 2007.

28. McRae J, Smith C, Beeke S, Emmanuel A. Oropharyngeal dysphagia management in cervical spinal cord injury patients: an exploratory survey of variations to care across specialised and non-specialised units. Spinal Cord Series and Cases. 2019;5(1) DOI: 10.1038/s41394-019-0175-y.

29. Bianchi A, Barbara M, Monini S. Selective rehabilitative approach to neurological dysfunctions of the oro-pharyngo-laryngeal trivium. Acta Otolaryngol. 2014;134(11):1172-8.

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ARTICLE (Continuous Flow)

Appendix 1. Collection form

GENERAL DATA		
Record of the medical record:	Initials of the name:	Gender: Age:
Hospital admission date:		Date of hospital discharge:
Length of stay:		
CLINICAL DATA		
Clinical picture/problems list:		
Level or location of injury (ASIA, 2011):	Extent of injury:	Cause of trauma or injury:
Did you need IOT? Yes ( ) No ( ) IOT time:	Mechanical ventilation via TQT? Yes ( ) No ( ) VM Time:	Type of tracheostomy: Time of tracheostomy:
Decanulação: Sim ( ) Não ( )	How long will the tracheostomy take:	
Hospital discharge with tracheostomy? No ( ) Yes ( ). If yes, what type? Cuffed? Yes ( ) No ( ) Insufflated? ( ) Not ( )		
SPEECH THERAPY DATA:		
Speech therapy admission date:		Follow-up time speech therapy:
Reason for requesting speech therapy:		
Dysphagia degree (initial) - according to PARD:		Dysphagia degree (initial) - according to PARD:
FOIS (initial): Released consistency:		FOIS (endl): Released consistency:
BDT (result):		BDTM (result):
Therapeutic objective: ( ) salivary swallowing ( ) optimize swallowing biomechanics ( ) reintroduction of oral diet ( ) decannulation ( ) MV feeding ( ) oral pleasure ( ) oral feeding management ( ) others:		
Therapeutic method: ( ) direct therapy ( ) indirect therapy ( ) bandaging ( ) occlusion training with plunger ( ) use of speaking valve ( ) use of speech valve in MV ( ) airflow redirection training ( ) minimal taste stimulation ( ) tactile-thermic stimulus (cold), (cold), (warm), (hot) ( ) gustatory tactile-thermal stimulus (sour), (sweet), (salty) ( ) temperature alternation ( ) texture alternation ( ) flavor alternation ( ) swallowing inducing maneuver (which ones)? ( ) others:		