

Impact of speech and swallowing therapy on oropharyngeal dysphagia in patients with systemic sclerosis and dermatomyositis: a pilot study

Impacto de la terapia del habla en la disfagia orofaríngea en pacientes con esclerosis sistémica y dermatomiositis: un estudio piloto

Impacto da terapia fonoaudiológica na disfagia orofaríngea em pacientes com esclerose sistêmica e dermatomiosite: um estudo piloto

Maria Tavares da Rosa^{1*}

ORCID: 0009-0006-6111-2884

Krys Soraya Rocha Cirio Paes¹

ORCID: 0000-0003-1251-2970

Márcio José da Silva Moreira²

ORCID: 0000-0003-0072-9507

Verônica Vilela¹

ORCID: 0000-0002-8676-4268

Sueli Carneiro¹

ORCID: 0000-0001-7515-2365

¹Universidade do Estado do Rio de Janeiro. Rio de Janeiro, Brazil.

²Universidade Federal Fluminense. Rio de Janeiro, Brazil.

How to cite this article:

Rosa MT, Paes KSRC, Moreira MJS, Vilela V, Carneiro S. Impact of speech and swallowing therapy on oropharyngeal dysphagia in patients with systemic sclerosis and dermatomyositis: a pilot study. Glob Acad Nurs. 2026;7(3):e553. <https://dx.doi.org/10.5935/2675-5602.20200553>

***Corresponding author:**mariatavaresdarosa@gmail.com**Submission:** 03-25-2026**Approval:** 05-07-2026**Abstract**

This study aimed to evaluate the impact of speech-language therapy on oropharyngeal dysphagia in patients with systemic sclerosis (SSc) and dermatomyositis (DM), comparing structured therapy combined with speech-language management versus speech-language management alone. An observational pilot study was conducted with 19 participants (7 DM and 12 SSc) aged 18 to 65 years who had oropharyngeal dysphagia. Participants were assigned to two groups: Group A (structured speech-language therapy + speech-language management) and Group B (speech-language management alone). After eight months, they were re-evaluated using the same initial parameters. In patients with SSc, a reduction in symptoms was observed in both groups, with a greater magnitude in Group A. In patients with DM, there was slight improvement, with no significant difference between the groups. Speech-language therapy was associated with improvement in clinical parameters of dysphagia, especially in patients with SSc. Due to the small sample size, the results should be interpreted as exploratory.

Descriptors: Dermatomyositis; Polymyositis; Scleroderma, Systemic; Deglutition Disorders; Speech Therapy.

Resumen

Este estudio tuvo como objetivo evaluar el impacto de la terapia del habla y el lenguaje en la disfagia orofaríngea en pacientes con esclerosis sistémica (ES) y dermatomiositis (DM), comparando la terapia estructurada combinada con la terapia del habla y el lenguaje frente a la terapia del habla y el lenguaje sola. Se realizó un estudio piloto observacional con 19 participantes (7 con DM y 12 con ES), de 18 a 65 años, con disfagia orofaríngea. Los participantes se dividieron en dos grupos: grupo A (terapia del habla y el lenguaje estructurada + terapia del habla y el lenguaje) y grupo B (terapia del habla y el lenguaje sola). Tras ocho meses, se les reevaluó utilizando los mismos parámetros iniciales. En los pacientes con ES, se observó una reducción de los síntomas en ambos grupos, con mayor magnitud en el grupo A. En los pacientes con DM, se observó una leve mejoría, sin diferencias relevantes entre los grupos. La terapia del habla y el lenguaje se asoció con una mejoría en los parámetros clínicos de la disfagia, especialmente en los pacientes con ES. Debido al pequeño tamaño de la muestra, los resultados deben interpretarse como exploratorios.

Descriptores: Dermatomiositis; Polimiositis; Esclerodermia Sistémica; Trastornos de Deglución; Logopedia.

Resumo

O presente estudo teve como objetivo avaliar o impacto da terapia fonoaudiológica na disfagia orofaríngea em pacientes com esclerose sistêmica (ES) e dermatomiosite (DM), comparando terapia estruturada associada ao gerenciamento fonoaudiológico versus gerenciamento fonoaudiológico isolado. Conduziu-se um estudo piloto observacional com 19 participantes (7 DM e 12 ES), entre 18 e 65 anos, com disfagia orofaríngea. Os participantes foram alocados em dois grupos: grupo A (terapia fonoaudiológica estruturada + gerenciamento fonoaudiológico) e grupo B (gerenciamento fonoaudiológico isolado). Após oito meses, foram reavaliados com os mesmos parâmetros iniciais. Nos pacientes com ES, observou-se redução dos sintomas em ambos os grupos, com maior magnitude no grupo A. Nos pacientes com DM, houve melhora discreta, sem diferença relevante entre os grupos. A terapia fonoaudiológica esteve associada à melhora de parâmetros clínicos da disfagia, especialmente em pacientes com ES. Devido à amostra reduzida, os resultados devem ser interpretados como exploratórios.

Descritores: Dermatomiosite; Polimiosite; Esclerose Sistêmica; Transtornos de Deglutição; Fonoterapia.

Introduction

Dysphagia, defined as any alteration in the swallowing process, can involve issues ranging from impaired lip seal, food propulsion, and the swallowing reflex to difficulties with pharyngeal and esophageal transit, as well as esophageal anatomy and physiology¹. Dysphagia is not a disease in itself, but rather a symptom of an underlying condition; it is a significant comorbidity in patients with Systemic Sclerosis (SSc) and Dermatomyositis (DM), as it can compromise the patient's nutritional and hydration status and even interfere with their treatment^{2,3}. The primary goal of speech-language therapy is to improve swallowing by addressing the functions of the oral sensorimotor system (swallowing, chewing, sucking, breathing, and speech) and developing compensatory or adaptive mechanisms that enhance the quality of feeding and mitigate the risk of pulmonary aspiration⁴.

SSc is a chronic autoimmune disease characterized by vascular and tissue fibrosis. Its most frequent manifestation is cutaneous fibrosis, which varies widely, ranging from localized plaques to generalized disease with systemic involvement. More than 90% of patients exhibit esophageal involvement, with dysphagia being the most common symptom, although over half of the patients report no complaints⁵. DM is a chronic, idiopathic, inflammatory systemic disease of unknown cause, the primary manifestation of which is proximal muscle weakness, affecting striated muscle, the skin, and internal organs^{6,7}. It is the most common primary myopathy in adults and may be associated with gastrointestinal motility dysfunction⁵. Dysphagia is found in 10% to 15% of these patients and is a sign of severity^{3,6}. Currently, the management of dysphagia associated with these diseases relies primarily on pharmacological interventions; there is a scarcity of specific speech-language pathology protocols for assessment or treatment, as well as a lack of professionals specializing in this area⁸.

Investigating these two diseases in the same study is justified by the fact that both can present with dysphagia, albeit through distinct pathophysiological mechanisms. In SSc, fibrotic changes and upper gastrointestinal tract dysmotility predominate, whereas in DM, inflammatory involvement of the striated musculature can directly affect swallowing biomechanics. Thus, comparing these conditions is clinically relevant, as it enables the identification of differences in the profile of swallowing impairment and the response to speech-language pathology intervention, thereby helping to enhance the potential for a more targeted therapeutic approach.

In this regard, this pilot study aimed to evaluate the impact of structured speech-language therapy combined with speech-language management on oropharyngeal dysphagia in patients with DM and SSc, and to compare the results obtained with those of speech-language management alone.

Methodology

A pilot observational study involving participants of both sexes, aged 18 to 65, diagnosed with SSc and DM (12

with SSc and 7 with DM) by the Rheumatology team and with oropharyngeal dysphagia, diagnosed by an experienced speech-language pathologist using validated institutional protocols for oral motor function, along with assessments for xerostomia, reduced oropharyngeal muscle strength, decreased mobility, limited mouth opening, gastroesophageal reflux, dysphonia, and odynophagia. Patients with other connective tissue diseases or neoplasms, as well as those with uncontrolled diabetes mellitus, arterial hypertension, or thyroid disease, were excluded.

Follow-up was conducted at the Connective Tissue Diseases outpatient clinic within the Rheumatology Department of Pedro Ernesto University Hospital/Rio de Janeiro State University. Participants were enrolled consecutively as they attended follow-up appointments at the Connective Tissue Diseases clinic and met the eligibility criteria. After signing the Informed Consent Form, allocation was performed using a sequential, alternating method in a 1:1 ratio, stratified by underlying diagnosis (SSc or DM). Thus, within each diagnostic stratum, the first eligible patient was assigned to Group A, the second to Group B, and so on. There was no randomization process. Group A received structured speech-language therapy, which included myotherapy to optimize sensorimotor-oral system functions (swallowing, chewing, sucking, breathing, and speech) combined with speech-language management, consisting of guidance and training in swallowing-facilitation, airway-protection, and airway-clearing maneuvers, once a week for eight months, totaling 35 in-person sessions. Each session involved 30 minutes of myofunctional techniques aimed at optimizing sensorimotor-oral system functions, followed by another 30 minutes of training in swallowing-facilitation, airway-protection, and airway-clearing maneuvers. Additionally, a home-based regimen of myotherapy exercises was prescribed for 40 minutes, once daily. Participants in Group B also received 35 weekly in-person sessions over eight months, consisting exclusively of 30 minutes of speech-language management, including guidance and training in the same swallowing and airway-protection maneuvers, but without the home-based practice of myotherapy exercises.

Myotherapy was performed with the patient seated comfortably in front of a mirror. It initially consisted of relaxation exercises, lymphatic drainage, and mobilization and stretching of the face, cervical region, and shoulder girdle. Subsequently, the session included isometric oromyofunctional exercises (prioritizing the size and mobility of the targeted muscles) and isotonic exercises (focusing on muscle strength), as well as vocal exercises, exercises to optimize orofacial sensorimotor functions (swallowing, chewing, sucking, breathing, and speech), and proprioceptive work on the speech-articulation organs (structures involved in speech production). Vocal exercises aim to promote glottic closure and laryngeal excursion, which are important for protecting the lower airway during the pharyngeal phase of swallowing. Exercises targeting orofacial sensorimotor functions were also performed alongside direct swallowing therapy, that is, using liquid, semi-liquid, and solid food consistencies. The myotherapy



regimen was taught to and practiced with the participants during the initial consultation so they could replicate it at home once daily. At the follow-up visit, participants were questioned and assessed regarding their execution and reproduction of the technique, and corrections were made where appropriate. Speech-language pathology management involved advising patients on oral hygiene, the use of utensils during meals, and dietary adjustments regarding consistency, quality, volume, temperature, and viscosity to facilitate food intake and minimize the risk of pulmonary aspiration. It also included training in postural maneuvers (involving the head and/or trunk) and swallowing facilitation maneuvers, which were to be used preventively during meals.

During the sessions, biosafety protocols were followed: hand washing before and after patient contact, and the use of protective barriers such as gloves, masks, and gowns. Assessment tools included a Littmann® Cardiology III stethoscope (used for cervical auscultation), a penlight, gauze (for cleaning the oral cavity), wooden tongue depressors, a digital oximeter, and a caliper (to measure maximum mouth opening). Additionally, the following items were used: THICKEN UP CLEAR® food thickener (to achieve the desired consistency), liquids (juice), sliced bread, cream crackers, plastic spoons (holding approximately 5 ml), plastic plates, plastic cups, straws, and syringes (to control the volumes administered: 5, 10, and 15 ml). Patients with conditions such as pulmonary disease, diabetes, and hypertension maintained dietary restrictions appropriate for their clinical status. This took place over an eight-month follow-up period - a timeframe in which successful rehabilitation of mechanical dysphagia via speech therapy is typically observed¹⁰, and 35 in-person sessions, the study aimed to compare Group A - comprising 12 participants (7 with SSc and 5 with DM) who underwent myofunctional techniques combined with speech-language pathology management - with Group B - comprising 7 participants (5 with SSc and 2 with DM) treated solely with speech-language

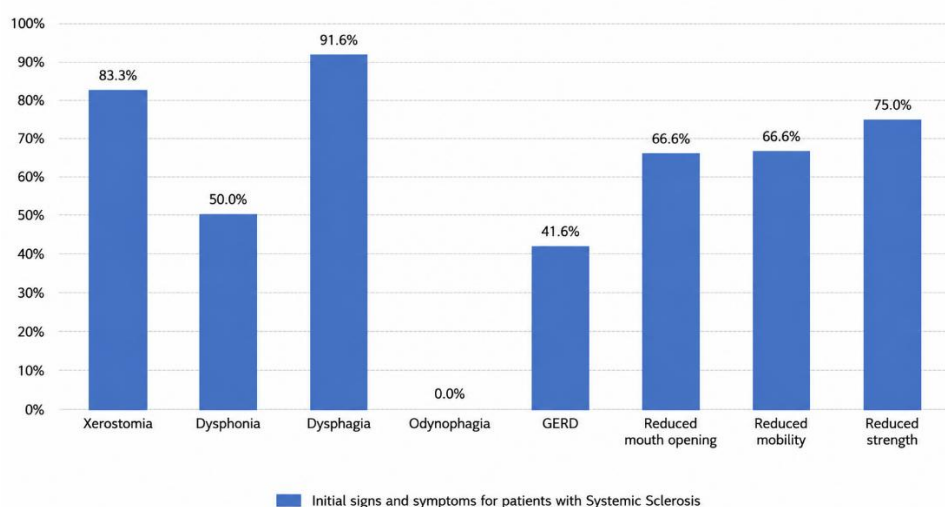
pathology management. Participants were evaluated regarding therapeutic response, defined as the primary outcome, using the same clinical parameters as the initial assessment: presence of dysphagia, xerostomia, reduced oropharyngeal muscle strength, reduced mobility, limited mouth opening, gastroesophageal reflux, dysphonia, and odynophagia. Findings were recorded on the initial and final speech-language pathology clinical assessment forms and subsequently systematized for analysis. Secondary outcomes included changes in these signs and symptoms during follow-up, the need for diet modification, the discontinuation or continued use of food thickeners, and the occurrence of aspiration or pneumonia during the follow-up period. No validated, standardized score specific to dysphagia was used as the primary measure.

The study was approved by the Research Ethics Committee (CEP) of Pedro Ernesto University Hospital, protocol number 5,774,531, on November 23, 2022, and all enrolled participants signed the Informed Consent Form.

Results

Among the 19 participants analyzed, 36.8% (7/19) had DM, and 63.2% (12/19) had SSc. The overall mean age was 46.7 years; in the DM subgroup, the mean age was 47.9 years, comprising 71.4% women (5/7) with a mean age of 47 years and 28.6% men (2/7) with a mean age of 50 years; the SSc subgroup consisted entirely of women (12/12) with a mean age of 46 years. Of the 12 participants with SSc, 7 (Group A) received structured speech-language therapy and speech-language management, while 5 (Group B) received speech-language management alone. The signs and symptoms common to both SSc groups at the start of speech-language intervention were, in descending order: dysphagia (91.6%), xerostomia (83.3%), reduced oropharyngeal muscle strength (75%), reduced mobility (66.6%), reduced mouth opening (66.6%), dysphonia (50%), and GERD (41.6%). Odynophagia was not observed in these patients (Graph 1).

Graph 1. Systemic Sclerosis: signs and symptoms in medical history. Rio de Janeiro, RJ, Brazil, 2023



After 35 in-person sessions over eight months, the following reductions were observed in Group A: dysphagia from 91.6% to 25%, xerostomia from 83.3% to 33.3%,

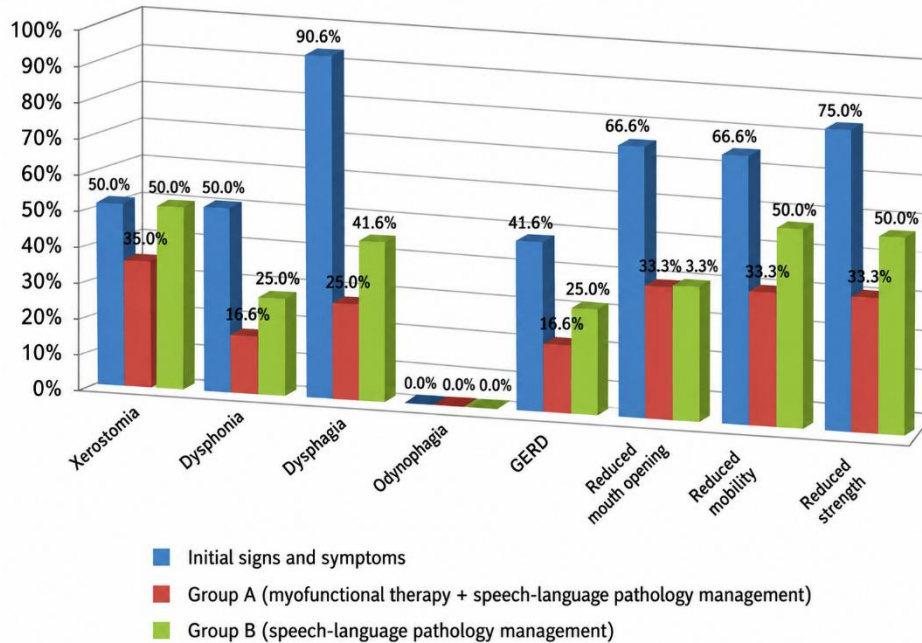
reduced strength from 75% to 33.3%, reduced mobility from 66.6% to 33.3%, and reduced mouth opening from 66.6% to 33.3%. Additionally, dysphonia decreased from 50% to



16.6%, and GERD from 41.6% to 16.6%. In Group B, the reductions were: dysphagia from 91.6% to 41.6%; xerostomia from 83.3% to 50%; reduced strength from 75% to 50%; mobility from 66.6% to 50%; and mouth opening from 66.6% to 33.3%. Furthermore, there was a reduction in dysphonia from 50% to 25% and in GER from 41.6% to 25%.

Odynophagia remained absent in both groups. These findings indicate clinical improvement with both approaches, with a descriptive trend favoring the treatment combined with speech-language pathology management (Graph 2).

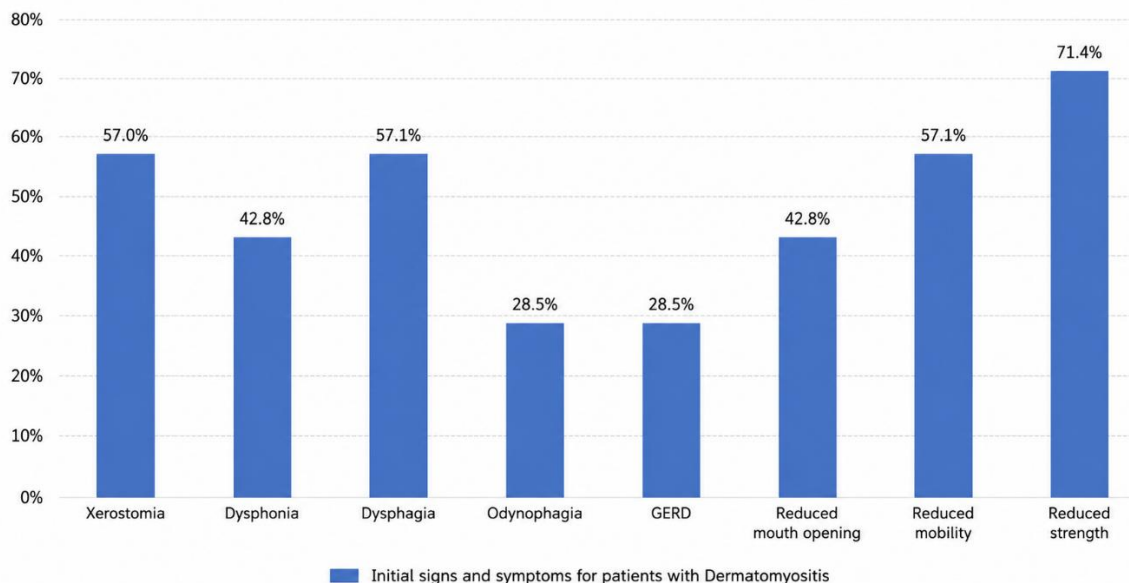
Graph 2. Scleroderma: outcome of therapeutic approaches in groups A and B. Rio de Janeiro, RJ, Brazil, 2023



Of the 7 participants with DM, 5 received structured speech-language therapy and speech-language management, while 2 were assigned to speech-language management alone. The common complaints among patients with DM were, in descending order: reduced

strength (71.4%), dysphagia (57.1%), reduced mobility (57.1%), xerostomia (57%), dysphonia (42.8%), reduced mouth opening (42.8%), GERD (28.5%), and odynophagia (28.5%), as shown in Graph 3.

Graph 3. Dermatomyositis: signs and symptoms in medical history. Rio de Janeiro, RJ, Brazil, 2023



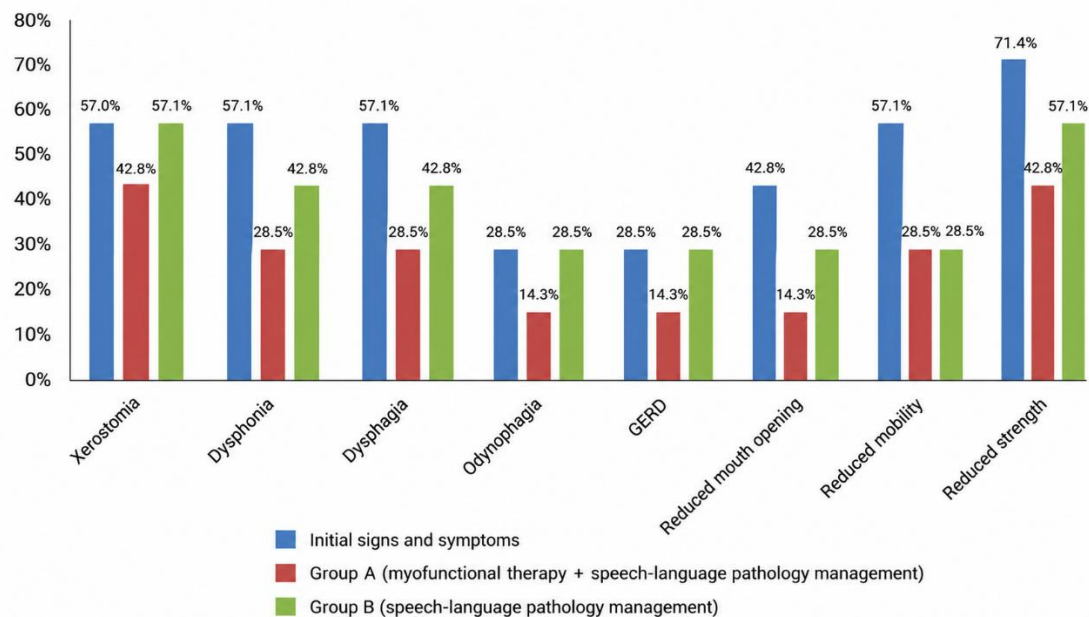
After 35 in-person sessions over eight months, a reduction in the following parameters was observed in Group A: strength (from 71.4% to 42.8%), dysphagia (from

57.1% to 28.5%), mobility (from 57.1% to 28.5%), xerostomia (from 57% to 42.8%), dysphonia (from 42.8% to 28.5%), mouth opening (from 42.8% to 14.3%), GER (from 28.5% to

14.3%), and odynophagia (from 28.5% to 14.3%). Structured therapy combined with speech-language pathology management (Group A) resulted in improved swallowing,

showing a favorable descriptive trend, compared to speech-language pathology management alone (Graph 4).

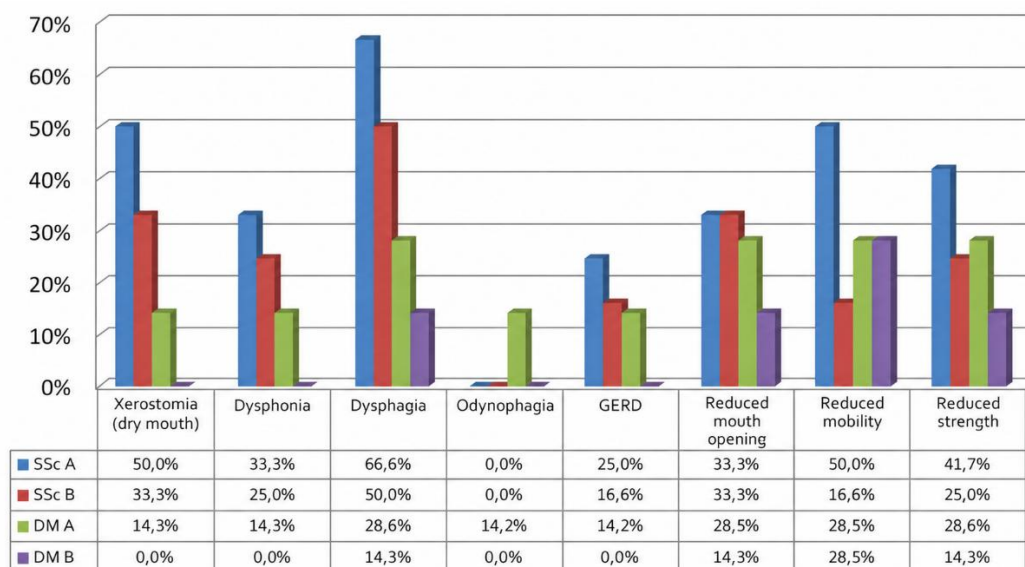
Graph 4. Dermatomyositis: outcome of therapeutic approaches in groups A and B. Rio de Janeiro, RJ, Brazil, 2023



Graph 5 consolidates the data from Graphs 2 and 3: Green represents participants with DM who underwent structured speech-language therapy combined with speech-language management and home practice guidelines (Group A), compared to purple, which represents participants with DM who underwent management alone (Group B). Blue represents participants with SSc who underwent structured

speech-language therapy combined with speech-language management and home practice guidelines (Group A), while red represents participants with SSc who underwent management alone (Group B). Thus, the comparative benefits of structured speech-language therapy, analyzed by symptoms, are demonstrated for both groups (SSc and DM) following the initial assessment using the same parameters.

Graph 5. Dermatomyositis and Systemic Sclerosis: benefits of the speech-language pathology approach in groups A and B. Rio de Janeiro, RJ, Brazil, 2023



Discussion

Speech and swallowing therapy have a beneficial impact on oropharyngeal dysphagia in SSc and DM⁹, although specific evidence for SSc is scarce.¹¹. Treatment for oropharyngeal dysphagia should last an average of eight months, or 35 speech therapy sessions, according to the

literature and results from various researchers regarding other conditions, such as head and neck cancer¹², achieving a satisfactory therapeutic response to dysphagia, which accounts for a substantial portion of esophageal manifestations in patients with connective tissue diseases^{2,5}. It was expected that during this time, patients would



consolidate their learning and be able to reproduce the techniques in their homes.

Of the 19 treated participants, the majority were women, which is consistent with epidemiological data on connective tissue diseases¹³.

Alterations in the speech-articulation organs, such as reduced strength and mobility of the associated musculature, limited mouth opening, dysphagia, and xerostomia, were observed more frequently in individuals with SSc compared to those with DM. Furthermore, structured speech-language therapy combined with speech-language management, or even speech-language management alone, appears to yield greater benefits for patients with SSc than for those with DM (Graph 5).

In SSc, peristalsis is most often inefficient or absent in the distal two-thirds of the esophagus due to low pressure; additionally, there is lower esophageal sphincter hypotonia, leading to potential distal dysphagia and GERD². Regarding this specific disease, there is a scarcity of studies demonstrating the detailed oral phases. It is important to highlight that swallowing begins with the proper preparation of the food bolus through mastication, combined with moistening by saliva and the positioning of the bolus on the tongue, followed by the ejection movement the tongue performs to transport it to the next phase of swallowing¹⁴.

Upon assessment, the treated patients with SSc exhibited muscle weakness, limited movement of oral structures, and tongue incoordination, factors that interfered with the proper preparation of the food bolus for swallowing and indicated the presence of oral and oropharyngeal dysphagia. Cutaneous involvement, manifesting as reduced skin elasticity in the face and neck, limited hyolaryngeal movement due to fibrotic plaques in the area, and restricted movement of the temporomandibular joint complex, further exacerbated swallowing difficulties. In a substantial number of SSc cases, it was necessary to alternate and modify food consistencies; this involved thickening liquids to a nectar-like consistency and avoiding solids, crumbly foods, and lactose to reduce the risk of aspiration. Myotherapy improved control, sensitivity, and flexibility of the orofacial musculature, directly contributing to the amelioration of dysphagia, an increase in the degree of mouth opening, and enhanced mobility and strength of the speech-articulation organs. Consequently, it was possible to discontinue the use of food thickeners in liquids for approximately 50% of the patients. Furthermore, adjusting food consistency-combined with pharmacological treatment, made it possible to reduce complaints of GERD in about two-thirds of the patients, particularly in Group A. No episodes of pulmonary aspiration or pneumonia were reported in any of the groups during the eight-month therapeutic intervention.

Evidence from case series suggests that improved swallowing techniques can be effective for patients with SSc and pharyngoesophageal dysphagia. In a series of five patients with this manifestation, two patients with long-standing disease experienced resolution of dysphagia solely through improvements in swallowing techniques¹⁵.

In patients with DM, albeit to a lesser extent than observed in SSc, hyolaryngeal dynamics were also restricted across the three diet consistencies used, reinforcing that cutaneous and muscular involvement of the anterior cervical region and face hinders chewing, swallowing, and protection of the lower airways⁶. In the assessment, individuals with controlled disease who were undergoing pharmacological treatment demonstrated better swallowing performance. Group A exhibited difficulties in performing oromyofunctional exercises, particularly isotonic ones, due to reduced muscle strength, especially during the acute phase of the disease. The occurrence of choking episodes throughout the various stages of the disease necessitates the use of food thickeners added to liquids or the consumption of pre-thickened liquids.

Dysphonia, with higher severity scores in DM, suggests strain on the intrinsic laryngeal muscles. However, exercises targeting these muscles yielded more significant benefits for SSc than for DM. The profound muscle weakness observed during acute flare-ups of DM is believed to be a significant impediment to performing the exercises. Such flare-ups require medications with potent anti-inflammatory and immunosuppressive properties, leading to the regression of oropharyngeal signs and symptoms. SSc tends to progress more slowly, with a progressive loss of swallowing function, which facilitates a kinesiotherapeutic approach and the gradual recovery of function². Many reports in the literature show that speech-language therapy plays an important supportive role in the management of oropharyngeal dysphagia in DM^{16,17}. Management by nutritionists and speech-language pathologists, including guidance on food consistency and head positioning, is recommended, with escalation to invasive interventions when conservative measures prove insufficient.

The speech-language pathology approach appears more effective for patients with SSc, consistent with the pattern of greater esophageal involvement, when compared to patients with DM. According to literature and clinical practice, suggestive cervical auscultation of laryngeal penetration can indicate severe dysphagia; however, this finding was not observed in any of the patients¹⁸.

Conclusion

The targeted speech-language pathology approach was associated with improved swallowing and a reduction in dysphonia, GER, and xerostomia, as well as increased mobility, flexibility, and strength of the orofacial musculature, thereby contributing to improved quality of life for the individuals and enhancing the therapeutic response.

Although less effective than structured speech therapy combined with myotherapy, this isolated management approach was associated with improved swallowing, with the added advantage of being feasible even for elderly patients or those with cognitive impairment. Furthermore, it can be administered by other healthcare professionals involved in the patient's care who have received prior instruction, or even by caregivers or family members¹⁹. Speech-language therapy complements pharmacological treatment in preventing choking,



pulmonary aspiration, pneumonia, and infections, suggesting a significant role for the speech-language pathologist within the multidisciplinary team caring for patients with connective tissue diseases²⁰. Due to the small sample size, the results should be interpreted as exploratory;

a controlled speech-language pathology study is suggested involving patients with SSc and DM, as well as other rheumatic diseases, to detect swallowing problems that could compromise therapeutic success.

References

1. McCarty EB, Chao TN. Dysphagia and swallowing disorders. *Med Clin North Am.* 2021;105(5):939-54. <https://doi.org/10.1016/j.mcna.2021.05.013>
2. Ahuja NK, Clarke JO. Scleroderma and the esophagus. *Gastroenterol Clin North Am.* 2021;50(4):905-18. <https://doi.org/10.1016/j.gtc.2021.08.005>
3. Cheng I, Wong C-M. A systematic review and meta-analysis on the prevalence and clinical characteristics of dysphagia in patients with dermatomyositis. *Neurogastroenterol Motil.* 2023;35(9):e14572. <https://doi.org/10.1111/nmo.14572>
4. Baker J, Barnett C, Cavalli L, Dietrich M, Dixon L, Duffy JR, et al. Management of functional communication, swallowing, cough and related disorders: consensus recommendations for speech and language therapy. *J Neurol Neurosurg Psychiatry.* 2021;92(10):1112-25. <https://doi.org/10.1136/jnnp-2021-326767>
5. Nudelmann LM, Marafon DP, Islabão AG, Staub HL. Doenças reumáticas. In: Jotz GP, Carrara-de Angelis E, Barros APB, editors. *Tratado da deglutição e disfagia.* Rio de Janeiro: Revinter; 2009. p. 101-18.
6. Cheng I, Wong CSM, Chan HHL. A retrospective review of clinical characteristics and risk factors of dysphagia in patients with dermatomyositis. *Dysphagia.* 2025;40(3):626-36. <https://doi.org/10.1007/s00455-024-10763-6>
7. Fitzgerald R, Triadafilopoulos G. Esophageal manifestation of rheumatic disorders. *Semin Arthritis Rheum.* 1997;26:641-66. In: Jotz GP, Carrara-de Angelis E, Barros APB, editors. *Tratado da deglutição e disfagia.* Rio de Janeiro: Revinter; 2009. p. 145-70.
8. Shaik MR, Shaik NA, Mikdashi J. Autoimmune dysphagia related to rheumatologic disorders: a focused review on diagnosis and treatment. *Cureus.* 2023;15(7):e41883. <https://doi.org/10.7759/cureus.41883>
9. 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. <https://doi.org/10.1590/S1516-80342007000300007>
10. Hegland KW, Murry T. Nonsurgical treatment: swallowing rehabilitation. *Otolaryngol Clin North Am.* 2013;46(6):1073-85. <https://doi.org/10.1016/j.otc.2013.08.003>
11. Mendoza FA, DiMarino A, Cohen S, Adkins C, Abdelbaki S, Rattan S, et al. Treatment of severe swallowing dysfunction in systemic sclerosis with IVIG: role of antimuscarinic antibodies. *J Clin Med.* 2022;11(22):6665. <https://doi.org/10.3390/jcm11226665>
12. Netto PI, Carrara-de Angelis E, Barros B. Princípios da reabilitação das disfagias orofaríngeas. In: Jotz GP, Carrara-de Angelis E, Barros APB, editors. *Tratado da deglutição e disfagia: no adulto e na criança.* Rio de Janeiro: Revinter; 2009. p. 330-41.
13. Motta F, Di Simone N, Selmi C. The impact of menopause on autoimmune and rheumatic diseases. *Clin Rev Allergy Immunol.* 2025;68(1):32. <https://doi.org/10.1007/s12016-025-09031-8>
14. Kadakuntla A, Juneja A, Sattler S, Agarwal A, Panse D, Zakhary N, et al. Dysphagia, reflux and related sequelae due to altered physiology in scleroderma. *World J Gastroenterol.* 2021;27(31):5201-18. <https://doi.org/10.3748/wjg.v27.i31.5201>
15. Rajapakse C. Pharyngoesophageal dysphagia: an under recognised, potentially fatal, but very treatable feature of systemic sclerosis. *Intern Med J.* 2016;46(11):1340-4. <https://doi.org/10.1111/imj.13243>
16. Mano T, Soyama S, Sugie K. Improvement in tongue pressure precedes improvement in dysphagia in dermatomyositis. *Clin Pract.* 2022;12(5):797-802. <https://doi.org/10.3390/clinpract12050083>
17. Sun C, Tian X, Li S, Wang G, Lu X. Tongue myositis in dermatomyositis with anti-PM-Scl 75 antibody: two case reports. *BMC Musculoskelet Disord.* 2025;26(1):868. <https://doi.org/10.1186/s12891-025-09114-9>
18. Jaghbeer M, Sutt AL, Bergström L. Dysphagia management and cervical auscultation: reliability and validity against FEES. *Dysphagia.* 2023;38(1):305-14. <https://doi.org/10.1007/s00455-022-10468-8>
19. Silvia A, Speyer R, Cordier R, Windsor C, Korim Ž, Tedla M, et al. Evaluating behavioural interventions for oropharyngeal dysphagia in adults: a systematic review and meta-analysis of swallowing manoeuvres, exercises, and postural techniques. *J Clin Med.* 2025;14(20):7180. <https://doi.org/10.3390/jcm14207180>
20. Speyer R, Cordier R, Sutt AL, Remijn L, Heijnen BJ, Balaguer M, et al. Behavioural interventions in people with oropharyngeal dysphagia: a systematic review and meta-analysis of randomised clinical trials. *J Clin Med.* 2022;11(3):685. <https://doi.org/10.3390/jcm11030685>