EFFECTIVENESS OF SPEECH THERAPY IN THE TREATMENT OF VOCAL FOLD POLYPS

Efetividade da fonoterapia no tratamento do pólipo em pregas vocais

Daniela de Vasconcelos [1], Adriana Oliveira de Camargo Gomes [1], Cláudia Marina Tavares de Araújo [1]

ABSTRACT

The aim of this study was to verify the effectiveness of speech therapy in the treatment of vocal fold polyps by reviewing existing literature. Literature search was conducted through PublicMedline platform and the Scopus, Science Direct, Cumulative Index to Nursing and Allied Health Literature and Web of Science databases, followed by critical pre-selection and deep analysis of the articles. There were included original articles in which the speech therapy was used as treatment for vocal polyp, no publication date or language restrictions. There were excluded studies addressing just other treatments for vocal polyp and also articles in which the speech therapy was used only after laryngeal surgery. A total of 905 articles were found. However, after the selection stages, only nine articles were chosen to be part of the sample. The selected articles were fully analyzed, registered through previously developed protocol. The articles analyzed in this study showed poor methodology and lack of standardization regarding the speech therapy protocols and procedures used. It was consisted mostly by retrospective case series. The sample of studies reviewed presented variation in the number of participants, the type of lesion and type of polyp. The predominant type of intervention in the studies was the direct and indirect speech therapy associated, which demonstrated effectiveness in the treatment of polyps on the vocal folds. Speech therapy for the treatment of vocal fold polyps demonstrated effectiveness between 30% and 100% of the analyzed studies, with better results in small and recent polyps.

KEYWORDS: Laryngeal Diseases; Speech Therapy; Voice Training; Treatment Outcome

INTRODUCTION

In speech therapy clinic, more specifically in voice area, the most common laryngeal lesions are organofunctional lesions in vocal folds, especially nodules and polyps, whose etiological factors are directly related to inappropriate vocal behavior through bad use or abuse use of the voice[1].

Vocal fold polyps are lesions of benign mass, generally unilateral, which can be classified into sessile or pendunculated in relation to form, or into gelatinous (translucent), fibrous (organized) and angiomatous (hemorrhagic)[2-8] in relation to histological characteristics[9]. However, other irritation processes may collaborate to the appearance of polyp, such as gastroesophageal reflux, aspiration of aggressive chemical substances or intense respiratory activities[10]. The main vocal symptoms presented are hoarseness and breathiness, besides vocal fatigue[7,11].

The treatment normally adopted for this type of vocal fold lesion is surgical[12] despite pre-surgical vocal speech therapy being considered efficient in aiding the regression of the edema associated to polyp and sub-adjacent areas, thus reducing the area of intervention during surgery[10]. Speech therapy is indicated after surgery with the purpose of adapting the vocal behavior in order to avoid the relapse of the lesion[13]. However, some recent studies highlight the importance of speech therapy as a primary treatment of polyp, with results of complete or partial regression of the lesion, followed by the indication of surgery in situation persistent

[1] Universidade Federal de Pernambuco – UFPE – Recife (PE), Brasil.

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lesion and dissatisfaction regarding the resulting vocal quality[8,9,14-16].

Despite the increasing number of publications and presentations of case studies in national and international scientific events on initial speech therapy as the treatment of vocal fold polyp, the routine medical approach is still surgical intervention, which requires the application of general anesthesia, besides being liable to complications during or after the intervention[8,12,14-24].

The consensus of referring patients with vocal fold nodule to speech therapy resulted in more qualified publications of scientific studies and proof of its effectiveness[12]. On the other hand, patients with vocal fold polyps previously referred to speech therapy are individuals with no surgical indication due to other health problems or that rejected surgery due to personal opinions[15,16]. This limitation of therapeutic indication compromises the development of new direct techniques, as well as analyses of the characteristics of possible clinical evolutions in the vocal treatment of polyp. This greatly hinders the consecration of its efficacy as a treatment of vocal fold polyp.

The objective of this study was to verify the effectiveness of speech therapy in the treatment of vocal fold polyps through bibliographic research with updated scientific evidence.

METHODS

This literature review sought to answer the following guiding question: Is speech therapy effective in the treatment of vocal polyp?

The bibliographic research was conducted through PublicMedline – PubMed platform, besides the Scopus, Science Direct, Cumulative Index to Nursing and Allied Health Literature - CINAHL and Web of Science databases from September to October 2014. The Cochrane database was also consulted to confirm the inexistence of systematic review article on the topic.

Medical Subject Headings (MeSH) descriptors and free terms in english language (all fields) relevant to the research were used. The free term vocal polyp was used in quotation marks and individually crossed with the following descriptors, with the boolean marker AND: speech therapy, therapeutics, treatment outcomes and voice training (MeSH); treatment, vocal therapy and vocal technique (all fields) (Figure 1).

As inclusion criteria, all the original articles that used speech therapy as treatment for vocal polyp

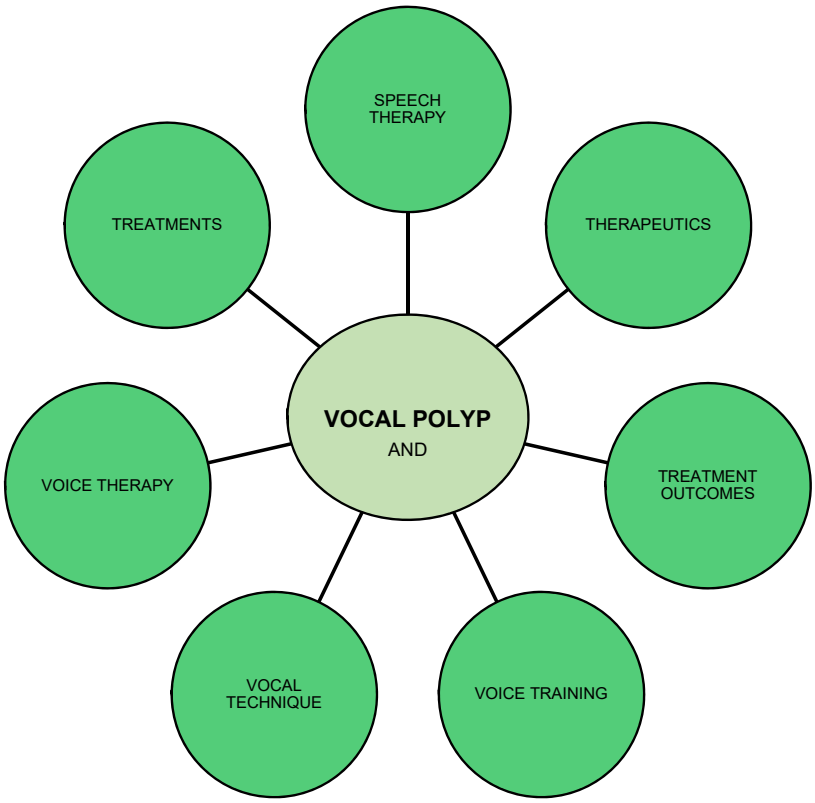

Figure 1 – Crossing descriptors

found in the search were considered, without restrictions in relation to the characteristics of the participants and/or lesion, publication date or language. Articles that exclusively addressed surgical treatment or treatment with medication as well as those only presenting speech therapy after surgery were excluded from the search. Chapters of books, dissertations, theses, literature reviews, case studies, reviews and editorials were not considered.

Two reviewers participated in the study conducting the search at the same time, observing identical crossings previously elaborated according to the objective of the study.

After identification in the databases, the articles were initially selected by title and reading of the abstract according to the inclusion and exclusion criteria. After reading the abstract, in the case of doubts, the complete text of the article was read and its inclusion agreed between the reviewers. The repeated articles were disregarded. Also, all articles referenced by the elected articles that met the inclusion criteria after initial selection by title and later by summary were considered (Figure 2).

The final articles were evaluated in relation to methodological quality, use of statistical analysis and accuracy of the results through book report protocol elaborated by the authors, with the purpose

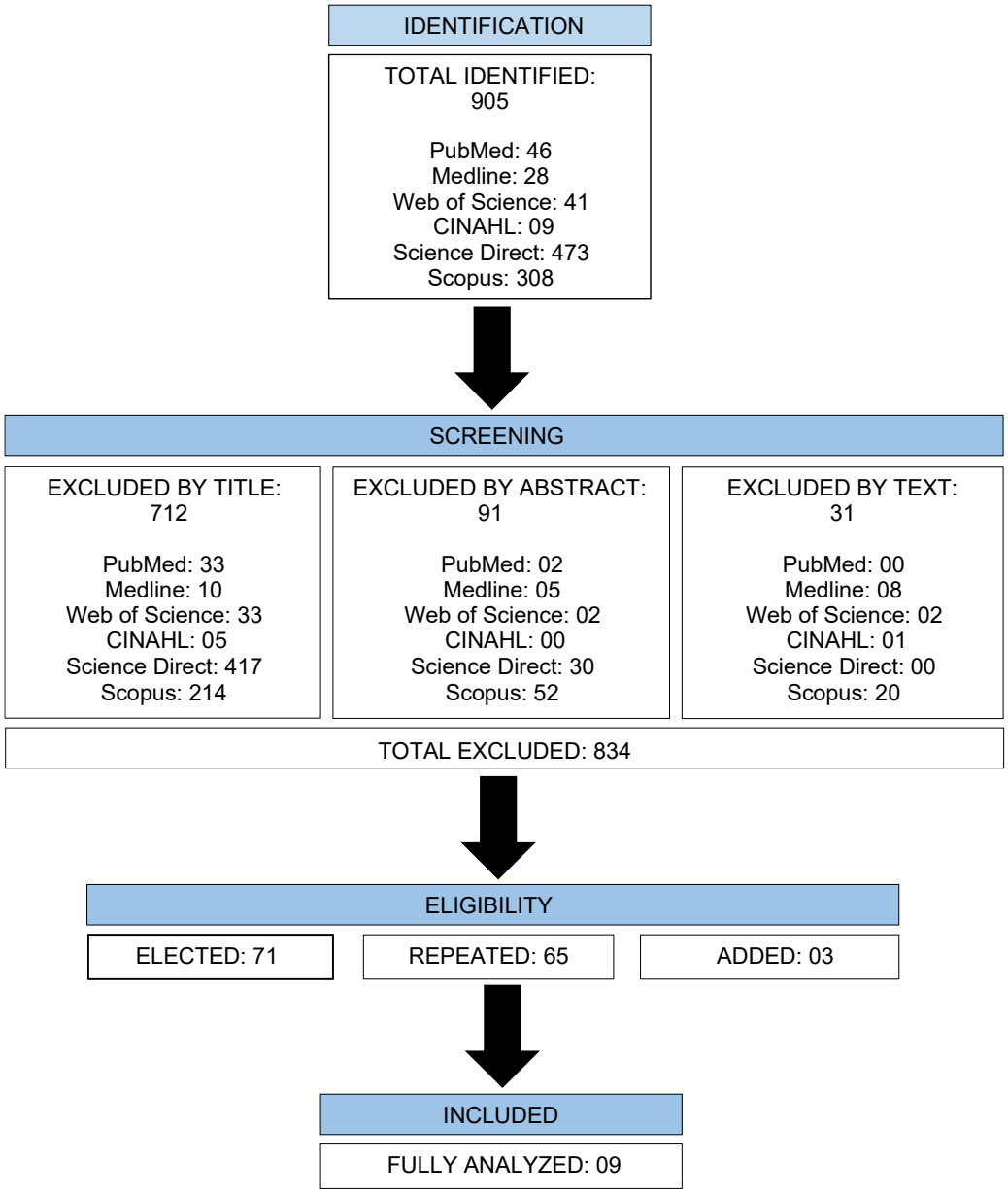

Figure 2 – Flow diagram of the article selection process

of discerning the relevance, reliability and validity of the studies for this review.

The book report protocol consisted of 20 questions, with possibility of positive and negative answers regarding the content of each study, evaluated through an analog scale of zero to 20 according to the number of positive answers presented. The questions contemplated title, abstract, introduction, method, ethical aspects, statistical analysis, results, discussions, methodological problems, conclusion and references. The methodological quality of the articles varied from 11 to 16 according to the critical analysis through the book report protocol used (Figure 3).

After this process, the articles were completely analyzed observing the previously elaborated protocol containing the following variables: author, year, location (country), type of study, sample,

BOOK REPORT PROTOCOL QUESTIONS	ARTICLES								
	1	2	3	4	5	6	7	8	9
1. The article answers the question: Is speech therapy effective in the treatment of vocal polyp?	Y	Y	Y	Y	N	N	N	Y	Y
2. Does the title contemplate the objective of the study?	Y	Y	N	N	Y	Y	N	Y	Y
3. Does it have a well-structured abstract?	Y	Y	Y	N	Y	Y	Y	Y	Y
4. Does the introduction contemplate the justification and objectives?	Y	Y	Y	Y	Y	Y	Y	Y	Y
5. Does it explain the study design?	Y	N	Y	N	N	Y	Y	N	N
6. Does it describe how the participants were selected?	Y	Y	N	Y	Y	N	Y	Y	N
7. Does it use a control group?	N	N	N	N	Y	N	N	N	Y
8. Is the sample significant, comprising at least 20 participants?	Y	Y	Y	Y	Y	N	Y	Y	Y
9. Does it provide information on data gathering, such as date and location?	Y	Y	Y	Y	N	N	Y	N	N
10. Was it analyzed by the Research Ethics Committee?	Y	Y	Y	Y	Y	Y	N	Y	Y
11. Does it clearly explain the methodological procedure of the study?	Y	Y	N	Y	Y	Y	N	Y	Y
12. Does it describe the statistical analysis used?	Y	Y	N	Y	Y	Y	Y	Y	Y
13. Was the statistical analysis used correctly?	Y	Y	N	Y	Y	Y	Y	Y	Y
14. Does it present clear tables, graphs or figures of the results obtained?	N	Y	Y	Y	Y	Y	Y	Y	Y
15. In the discussion, do the authors compare their results with results already existing in literature?	N	N	Y	Y	N	Y	Y	Y	Y
16. Do the authors express their opinions regarding the study topic?	Y	Y	Y	N	Y	Y	Y	N	Y
17. Do they refer to the biases of the research?	N	Y	N	N	Y	Y	N	Y	Y
18. Does the conclusion answer the initial question contemplated in the objectives?	Y	N	N	Y	Y	Y	N	Y	N
19. Is the conclusion clear and objective?	Y	N	Y	N	N	N	N	N	Y
20. Were the bibliographic references updated to the year of publication of the article?	Y	N	Y	Y	Y	N	N	N	Y
FINAL SCORE OF THE ARTICLES	**16**	**14**	**12**	**13**	**15**	**13**	**11**	**14**	**16**

Legend: Y – Yes; N – No; Articles: 1 – Cohen SM, Garrett CG.2007; 2 – Yun YS, Kim MB, Son YI.2007; 3 – Klein AM, Lehmann M, Harpner ER, Johns MM.2009; 4 – Cho KJ, Nam IC, Hwang YS, Shim MR, Park JO, Cho JH et al.2011; 5 – Rodríguez-Parra MJ, Adrián JA, Casado JC.2011; 6 – Schindler A, Mozzanica D, Ginocchio P, Maruzzi M, Ottaviani AF.2012; 7 – Nakagawa H, Miyamoto M, Kusuyama T, Mori Y, Fukuda H.2012; 8 – Schindler A, Mozzanica F, Maruzzi P, Atac Murat, Cristofaro V, Ottaviani F.2013; 9 – Adrián JA, Rodríguez-Parra MJ.2015.

Figure 3 – Methodological quality assessment results

classification of the polyp, type of intervention (direct or indirect) and effectiveness of the speech therapy, as shown in Table 1.

Were considered the effectiveness of speech therapy in the treatment of vocal fold polyp the complete resolution of the lesion or regression of the lesion in more than half of its initial size associated to satisfactory vocal improvement (adapted voice). Under these conditions, laryngeal surgery can be considered unnecessary. The critical analysis of the articles was elaborated by the main author, according to the variables observed in Table 1 and presented in the literature review.

Table 1 – Results of the studies according to variables analyzed

Author / Year	Location	Study Type	Sample	Type of polyp	Type of Intervention	Effectiveness
Cohen SM, Garret G. 2007	USA	Retrospective case series	57 participants with polyp or cyst (23 losses during treatment)	GE HE FB	FDI (Minimum of 2 sessions)	- 49.9% of complete resolution of the lesion and/or vocal satisfaction - Best results in gelatinous polyps
Yun YS, Kim MB, Son YI. 2007	South Korea	Retrospective case series	175 participants with polyp	HE N-HE	FI (1 session)	- 38.0% of regression or complete resolution of the lesion - Best results in recent and small polyps
Klein AM et al. 2009	USA	Retrospective case series	29 participants with polyp (7 losses during treatment)	HE	CIR (13 participants) FDI (16 participants)	- 56.3% of complete resolution of the lesion - Best results in small and medium polyps
Cho K.J et al. 2011	South Korea	Retrospective case series	158 participants with polyp	HE N-HE	FDI (Variable duration and frequency)	- 65.8% of regression or complete resolution of the lesion - Best results with small and whitish polyps
Rodríguez-Parra MJ, Adrián JA, Casado JC. 2011	Spain	Randomized clinical trial	42 participants with dysphonia (Nodule, polyp, Reinke's edema and glottal gap) - 5 with polyp	HE	FD (21 participants - 3 polyps) FI (21 participants - 2 polyps)	- 100% of complete resolution of the lesion with FD - No complete resolution of the lesion with FI
Schindler A et al. 2012	Italy	Case series	16 participants (Cyst, pseudocyst, polyp and vocal fold edema) - 3 with polyp	GE	FDI (10 sessions, 2 per week)	- No complete resolution of the lesion - Moderate vocal improvement, but not significant
Nakagawa H et al. 2012	Japan	Retrospective case series	132 participants with polyp	All	FDI (Sessions with interval of 1-4 weeks, - 38 participants) OBS (94 participants)	- 47.4% of complete resolution and/or vocal satisfaction with FDI - Best results in women, small and recent polyps - Associated medication in 24 patients
Schindler A et al. 2013	Italy	Case series	85 participants (Reinke's edema, cyst and polyp) - 20 with polyp	GE	FDI (10 sessions, 2 per week)	- 45.0% of complete resolution of the lesion and/or vocal satisfaction - No complete regression
Adrián JA, Rodriguez-Parra MJ. 2015	Spain	Clinical trial	21 participants with dysphonia (Nodule, polyp, Reinke's edema and glottal gap) - 3 with polyp 21 participants without dysphonia	HE	FDI (24 sessions, 2 per week)	- 100% of complete resolution of the lesion

Legend: GE = translucent or gelatinous polyp, HE = hemorrhagic or angiomatous polyp, N-HE = non-hemorrhagic polyp, FB = fibrous or hyaline polyp, FD = direct speech therapy, FI = indirect speech therapy, FDI = direct and indirect speech therapy, CIR = surgery, OBS = observation

LITERATURE REVIEW

The possibility of speech therapy indication in the treatment of vocal fold polyp is relatively recent. The first articles about the topic appeared a little over a decade ago, from two different studies. The first suggested speech therapy as initial treatment for nodules and polyps[9] and the second identifies the discrepancy of its primary indication by otorhinolaryngologists (91% for nodules and 30% for polyps)[12]. Furthermore, there is the observation of spontaneous resolution of some polyps, during the preparation period for surgery[13]. As a result, the studies analyzed in this review had the direct or indirect objective of verifying the effectiveness of speech therapy in the treatment of benign vocal fold lesions, specifically the vocal polyp.

Despite the development on the topic in Europe, USA and Asian countries, the publications in Brazil are limited to case studies presented at congresses or published in book chapters, even though at an increasing number[17-23].

The types of studies used in the analyzed articles are mostly case series. It is emphasized that they are considered as first source of evidence for the development of new treatment lines, as recommended by the evidence-based practice[25]. However, this type of research is not enough to establish the efficacy of a treatment[26], thus there is a need for greater scientific refinement that can prove more thoroughly the effectiveness of speech therapy in the treatment of vocal fold polyp.

The two clinical trials articles analyzed[27,28] originated from a single research, however with different objectives and methodological procedures. The sample of these studies, which consisted of only three patients with vocal fold polyp, showed 100% complete regression of the lesion observed in the laryngeal assessment after speech therapy. However, the authors were prudent in confirming the effectiveness of speech therapy as treatment for this type of lesion for being considered a surgical therapeutic approach. They preferred to state that "The positive response to speech therapy does not seem to be determined by the type of vocal pathology since it occurred in dysphonias that require surgery (angiomatous polyps) and in those that do not require surgical intervention (nodules)" (p.26)[28].

The retrospective design of some of the analyzed articles[8,14-16,29], with search for information in medical records, showed methodological biases, such as incomplete filling out of the protocols, lack of standardization of the information, different technical approaches and different assistant professionals. On the other hand, it was these studies that enabled the higher number of participants in the sample, enabling the execution of a more consistent statistical analysis and determination of the characteristics of the polyps that best respond to speech therapy, especially in relation to the size and/or age (time of existence) of the lesion.

Regarding the methodology quality of the articles, it is emphasized that, besides the score variation from 11 to 16, according to the book report protocol used (Figure 3), other methodological issues were identified such as lack of assessment of the vocal characteristics[8,11], failure in the definition of the research groups[11,14,15], lack of information on speech therapy as the type of techniques used[8,11,15,29], treatment period[8,11,15,29] or session duration[8,11,15,29,30], besides the use of non-validated and/or non-standardized protocols[8,11,14-16,27,30,31] and different speech therapy approach among the participants of a same research group[11,27-31].

Although polyp being one of the most frequent benign lesions in vocal folds[4], the case series studies or clinical trials showed a limited number of participants, which varied from three to twenty[27,28,30,31]. Despite the phonotraumatic etiology in the vocal nodule, whose initial therapeutic indication is speech therapy, referring patients with vocal polyp to speech therapy before surgical procedure is a restricted practice of some otorhinolaryngologists[12], which hinders the recruitment of participants for the development of prospective researches.

Besides the variation in the number of participants, the sample of the analyzed studies were different in terms of content, with majority consisting of benign lesions in vocal folds[8,27,28,30,31]. Only four studies exclusively assessed patients with vocal polyp in their different types[14-16,29]. Hemorrhagic polyp was present in almost all except for two articles of the same authorship[30,31], whose participants only had gelatinous polyp. It is recorded that the highest occurrence of polyps in hemorrhagic stage was already expected since it was considered the most frequent type of vocal polyp[5]. However, it was not possible to determine the type of polyp that best responds to speech therapy because some studies only addressed one type of polyp[15,27,28,30,31]. Other used nomenclature difference in which more than one type was grouped (hemorrhagic and non-hemorrhagic)[14,29] or did not specify the results per type of polyp[16].

Another important aspect is the classification difference in terms of size of the lesions in the analyzed studies. Although estimating basically three sizes (small, medium and large), the authors classified them differently. Therefore, the small polyp, for example, was considered punctiform[15,16], with size corresponding up to 1/8 of the vocal fold[14]

or with a size up to 1/4 of the vocal fold[29]. Despite the classification used, four studies identified the best response to speech therapy in small polyps[14-16,29]. At the same time, five studies did not assess the size of the polyp[8, 27,28,30,31].

The superior response of small polyps to speech therapy can be justified by the fact that small lesions generally mean recent lesions, in which the histological development stage of the predominantly edematous lesion has greater capacity of regression or absorption.

Regarding the type of intervention applied, the use of combined direct and indirect speech therapy was predominant[8,15,16,28-31] since these are interconnected in clinical practice and are essential in speech treatment in patients with organofunctional lesions. The study that used the types of intervention in different situations showed comparative approach between the two models of speech therapy[27], or evaluated the possibility of regression of the lesion only from the modification of vocal behavior, which refers to indirect speech therapy[14].

Despite being presented as a comparative study between direct and indirect speech therapy, the randomized clinical study included in this review[27] used a number of vocal health recommendations during the treatment as procedure in direct speech therapy. Therefore, it can be concluded that the difference between the two groups of this study is exclusively justified by the use of direct vocal techniques in only one of them.

However, despite the predominant use of the associated form of direct and indirect speech therapy, the studies presented different treatment frequency and duration. Furthermore, there was no standardization including among the subjects of a same research, as reported in some studies[8,16,29], preventing the comparison between the interventions. It is also emphasized that the continuous orientation regarding vocal health during the therapeutic process probably plays a more educational role when compared to a single orientation moment, according to the approach of the analyzed study[14].

The lack of standardization also corresponded to the use of speech techniques in direct speech therapy. Few articles describe the techniques that were used in the treatment[27,29-31]. However, the authors stated that the techniques varied according to the individual needs of the participants, in relation to aspects such as choice of technique[16,27,29], severity of the hoarseness [29] or vocal behavior of the participant[30,31]. However, regarding these differences, it was observed that majority of the studies described the use of vocal hygiene education[9,14-16,27-31], modification of the vocal behavior[14,15,30,31], elimination of strong vocal attack[27-31], relaxation[27,28] and respiratory support[9,16,27-31] as direct speech therapy approach. However, it is emphasized that the most cited technique in the studies was the yawn-sigh[27-31], probably because it provides smooth speech and reduces hyperfunctional phonation behavior[32] present in people with vocal polyp.

Another factor that corroborates the difficult comparison between the studies is the lack of standardization of assessment and therapy protocols used, marked by the methodological differences between them. The American Speech-Language-Hearing Association (ASHA), in a document that defines the principles of the practice based on evidence for clinical decision making and promotion of the quality of clinical services, published in 2005, orients the adoption of standardized and validated instruments (protocols and comparative measures)[33]. The use of standardized assessment protocols was equally defended in the two clinical trials included in this review[27,28].

In spite of the comparison of the effectiveness of speech therapy in the treatment of vocal fold polyp in majority of the articles that make up the *corpus* of this study, their results were very diverse, varying from 38% to 100% effectiveness. It is emphasized that the effectiveness of speech therapy in complete regression of vocal polyp or partial regression of the lesion associated to vocal adaptation was considered in this review. The polyp that is small in size and of recent occurrence responded the best to speech therapy.

The analyzed articles showed very specific methodologies, different from one another, hindering the detailed analysis of their results and reliable comparison. The important variations of sample, instruments used for assessment and therapeutic approaches prevented the comparative analysis through meta-analysis.

Furthermore, in order for speech therapy in the treatment of vocal fold polyp to be confirmed, new researches with more methodological accuracy need to be developed, including clinical trials and longitudinal studies. These studies can outline which characteristics of polyp or the vocal quality of the patient can represent best results, resizing the therapeutic approach used.

CONCLUSION

Based on this literature review, it can be deduced that the publications on the topic showed poor methodology and lack of standardization regarding the assessment and speech therapy protocols used.

There was effectiveness of the speech therapy in the treatment of vocal fold polyp by complete or partial resolution of the lesion, associated to satisfactory vocal improvement between 38% and 100% in the participants of the analyzed studies. The polyp with small size and of recent occurrence having the best response to speech therapy.

RESUMO

O objetivo dessa revisão de literatura foi verificar a efetividade da fonoterapia no tratamento do pólipo em pregas vocais, a partir de levantamento bibliográfico. Foi realizada pesquisa bibliográfica na plataforma *PublicMedline* e nas bases de dados *Scopus*, *Science Direct*, *Cumulative Index to Nursing and Allied Health Literature* e *Web of Science*, seguindo etapas de seleção e análise crítica dos artigos. Foram incluídos artigos originais que utilizaram a fonoterapia como tratamento para o pólipo vocal, sem restrições de data de publicação ou língua. Foram excluídos artigos que abordassem exclusivamente outros tratamentos para pólipo vocal e os que utilizaram a fonoterapia somente após a cirurgia laríngea. Foram encontrados inicialmente 905 artigos. Após as etapas de seleção, restaram nove artigos na composição final da amostra. Foram então analisados na íntegra, cadastrados por meio de protocolo previamente elaborado que contemplou autor, ano, local, tipo de estudo, amostra, classificação do pólipo, tipo de intervenção e principais resultados. Os artigos analisados apresentaram fragilidade metodológica e ausência de padronização quanto aos protocolos e procedimentos fonoaudiológicos utilizados. Foram constituídos em sua maioria por série de casos retrospectiva. A amostra dos estudos variou em relação à quantidade de participantes, tipo de lesão e tipo de pólipo. A fonoterapia para o tratamento do pólipo em pregas vocais demonstrou efetividade entre 38% e 100% nos estudos analisados, com melhores resultados em lesões pequenas e recentes.

DESCRITORES: Doenças da Laringe; Fonoterapia; Treinamento da Voz; Resultado de Tratamento

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Mailing address:
Daniela de Vasconcelos
Avenida Dezessete de Agosto nº 500,
apartamento 101, Casa Forte
Recife – PE – Brasil
CEP: 52060-590
E-mail: daniela_vasconcelos@outlook.com

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