http://dx.doi.org/10.23925/2176-2724.2017v29i4p663-672

Elastic bandage as a therapeutic resource for the control of sialorrhea: an analysis of its efficacy

A bandagem elástica como recurso terapêutico para o controle da sialorreia: análise de sua eficácia

El vendaje elástico como recurso terapéutico para la gestión de babeo: análisis de su eficacia

Claudia Sordi[*]
Brenda Lima Araújo[*]
Lavínia Vieira Dias Cardoso[*]
Laura Alves Verena Correia[*]
Géssica Matos de Oliveira[*]
Sinthia Stefanny Souza da Silva[*]
Carla Patrícia Hernandez Alves Ribeiro César[*]

Abstract

Objective: To verify the efficacy of elastic bandaging in supra-hyoid muscles in patients with cerebral palsy. **Method:** Prospective clinical study with the technique of standardized applications of elastic bandage in suprahyoid muscles, performed for 8 weeks, consisting of three times a week. In order to analyze the efficacy of the procedure, questionnaires were applied (quality of life, control of saliva swallowing, frequency and severity of sialorrhea) and evaluation of sialorrhea staging in pre and post-therapy periods. There were compared two groups of patients, one called as assisted waiting and the other experimental , were compared with four subjects in the group, equally divided between sexes,

* Universidade Federal de Sergipe, São Cristóvão, Sergipe, Brazil.

Authors' contributions:
CS, CPHARC: orientation in all stages of the work, revision of the article and approval of the final version.
BLA: review of the article and approval of the final version.
LVDC , LAVC, GMO, SSSS: data collection, literature review, article preparation and approval of the final version.

Correspondence address: Claudia Sordi - claudia.sordi@gmail.com
Received: 24/03/2017
Accepted: 07/12/17

aged between four and twelve years (9 years ± 3.55) for the experimental group and between three and seven years (4.25 ± 1.89) the assisted waiting period. Elastic bandage was considered effective when the total score obtained after the procedure was equal to, or greater than three points. **Results:** According to the responsible persons there was a decrease in sialorrhea in all subjects of the experimental group by the use of elastic bandage, and improvement in quality of life. However, no progress was observed in the assisted waiting group. **Conclusion:** The efficacy of elastic bandaging for the control of sialorrhea was confirmed in the experimental group, contributing to the knowledge in the area of orofacial motricity, besides emphasizing the reflection about noninvasive speech therapy procedures.

Keywords: Sialorrehea; Speech Therapy; Clinical trial.

Resumo

Objetivo: Verificar a eficácia da aplicação da bandagem elástica na musculatura supra-hióidea de pacientes com paralisia cerebral. **Método**: Estudo clínico prospectivo com análise da técnica de aplicações padronizadas de bandagem elástica em musculatura suprahioídea, realizada por oito semanas, consistindo na sua troca por três vezes por semana. Para analisar a eficácia do procedimento, questionários foram aplicados (qualidade de vida, controle de deglutição da saliva, de frequência e gravidade da sialorreia) e foi realizada avaliação do estadiamento da sialorreia em períodos pré e pós-terapias. Foram comparados dois grupos de pacientes, um denominado por espera assistida e outro, experimental, ambos com quatro sujeitos no grupo, divididos igualitariamente entre os sexos, com idades entre quatro e doze anos (9 anos ± 3,55) para o grupo experimental e entre três e sete anos (4,25 ± 1,89) o de espera assistida. A bandagem elástica foi considerada eficaz quando o total de pontos obtidos após o procedimento foi igual ou superior a três pontos. **Resultados**: Houve diminuição da sialorreia em todos os sujeitos do grupo experimental por meio da aplicação da bandagem elástica e melhora na qualidade de vida, de acordo com seus responsáveis. No entanto, no grupo de espera assistida não foi observado progresso. **Conclusão**: A eficácia da aplicação da bandagem elástica para o controle da sialorreia foi comprovada no grupo experimental, contribuindo para o conhecimento na área da motricidade orofacial, além de enfatizar a reflexão acerca de procedimentos fonoterapêuticos não invasivos.

Palavras-chave: Fonoaudiologia; Sialorreia; Ensaio clínico

Resumen

Objetivo: Verificar la eficacia de la aplicación del vendaje elástico en la musculatura suprahioidea en pacientes con parálisis cerebral. **Método**: Estudio clínico prospectivo con análisis de la técnica de aplicaciones estandarizadas de vendaje elástico en la musculatura suprahioidea, realizada por 8 semanas, consistiendo en cambio tres veces por semana. Para analizar la eficacia del procedimiento, cuestionarios fueron aplicados (calidad de vida, control de deglución de la saliva, de frecuencia y gravedad de la sialorrea) y se realizó evaluación de la estadificación de la sialorrea en períodos pre y pos-terapias. Se compararon dos grupos de pacientes, uno denominado por espera asistida y otro experimental, ambos con cuatro sujetos en el grupo, divididos igualitariamente entre los sexos, con edades entre cuatro y doce años (9 años ± 3,55) para el grupo experimental y entre tres y siete años (4,25 ± 1,89) el de espera asistida. El vendaje elástico se considera eficaz cuando el total de puntos obtenidos tras el procedimiento fue igual o superior a tres puntos. **Resultados**: Hubo disminución de la sialorrea en todos los sujetos del grupo experimental por medio de la aplicación del vendaje elástico y mejora en la calidad de vida. No obstante, en el grupo de espera asistida no se observó progreso. **Conclusion**: La eficacia de la aplicación del vendaje elástico para el control de la sialorrea fue comprobada en el grupo experimental, contribuyendo para el conocimiento en el área de la motricidad orofacial, además de enfatizar la reflexión acerca de procedimientos fonoterapéuticos no invasivos.

Palabras clave: Fonoaudiología; Sialorrea; Ensayo clínico

Introduction

The salivary cells form aqueous secretions that contain multiple substances called saliva. Usually, healthy people can produce 1,000 to 1,500ml of saliva (average of 1,200ml) in a 24 hour cycle. Saliva is produced by the parotid, submandibular and sublingual salivary glands, considered as major glands, responsible for the production of 90% of the daily volume. The smaller glands are responsible for the other 10%[1].

The excess of salivation is called sialorrhea and may be caused by neurological problems or lesions affecting the mouth mucosa[2]. It was defined as the excessive loss of saliva through the oral cavity in an involuntary way, noting that this alteration may be present in a significant portion of the cases diagnosed with Non-Progressive Encephalopathy, more commonly known as Cerebral Palsy (CP)[3]. In general, 10 to 83% of the CPs present sialorrhea[4].

The regulation of salivary secretion occurs indirectly through the hypothalamic-solitary circuit and directly by modulated reflexes from tactile, gustatory and mechanical stimuli. However, there is a questioning about a possible interruption in this mechanism of regulation in patients with Cerebral Palsy[5].

It is known that, depending on the neuromotor severity of the subject with CP, they become dependent on their relatives for the performance of daily life activities, being considered as a problem for the acquisition of autonomy, which may affect interpersonal relations[6]. It is important to consider the sialorrhea in this context, since the difficulty of swallowing the saliva leads to the need for the relatives' care of the hygiene of the mouth and, depending on the severity, hands and objects.

The etiological agents of CP are multifactorial (including pre, peri and postnatal intercurrences)[7], as well as of sialorrhea, with influences of the bad formation of the bolus; absence of lip seal; ineffective sucking; increased food residue in pyriform sinuses; reduction of lips, tongue and jaw control, as well as intraoral sensitivity and the frequency of spontaneous swallowing[8]. Emotional status and the degree of concentration may also influence in the worsening of sialorrhea[9].

A systematic review study[10] about subjects with CP described some of the negative impacts on quality of life affecting patients, such as: social isolation, wet clothes, facial dermatitis, unpleasant odor, chewing and speech alterations.

Regarding the methods of measurement of sialorrhea, the ideal situation is that the child must be evaluated in everyday situations. It is necessary to quantify the frequency and severity of sialorrhea, as well as its impact on the quality of life not only of the child, but also of their caregivers[11].

The most commonly used treatment for the control of sialorrhea in children with cerebral palsy is from Speech, Language and Hearing Sciences [12,13]. It is based, specifically, on the use of functional and non-invasive techniques, such as active and passive myofunctional exercises administered in the oral cavity, as well as guidance to the family and the patient, regarding the awareness of the problem.

However, this technique is not always effective, leading the family to seek more invasive procedures, among which may be mentioned the use of drugs with anti-cholinergic effects, antiparkinsonian drugs, surgical treatment of the salivary ducts or glands, radiotherapy in the salivary glands and, more recently, the application of botulinum toxin type A in the salivary glands[13].

Another resource that has been used is the electromyography, which aims to promote a body modification via *biofeedback*, by monitoring the target muscle group for stimulation. When contracting a particular muscle group, the electromyograph emits a luminous or acoustic signal to inform that there has been a change in the muscular activity. Therefore, it is possible for the patient to improve some components of swallowing consciously. The technique can have a positive impact on patient training and improvement of the oromotor function[14].

When indicating a treatment for the control of sialorrhea in children with CP, it is necessary to consider the patients' access to the proposed method, considering the financial, social and cultural conditions of each family. It is worth reflecting on the cost of treatment and the risk of more invasive procedures, therefore, they can bring a lower overburden for each patient / family[15].

Thus, the search for new techniques trying to associate the effectiveness of the treatment with less invasive procedures and more affordable costs is necessary for several areas of knowledge, especially for Speech, Language and Hearing Sciences, because sialorrhea is one of the main complaints of family members of the patients with CP and

its control is within the competence of the speech therapist.

The elastic bandage was developed in the 1970s in Tokyo, Japan, to be used as a complementary support in the therapies of athletes and non-athletes patients. The application of the bandage has good results in the reduction of pain in various structures of the musculoskeletal system, as confirmed by the literature[16]. It can be considered as an alternative treatment and must be associated with other techniques[17].

It has been used mainly by physiotherapists, being a new resource in Speech, Language and Hearing Sciences practice, mainly as an aid in the treatment of musculoskeletal dysfunctions in orofacial motricity–it is used to increase or decrease muscle neuronal excitation[18]. Regarding its composition, it is a cotton adhesive and elastic tape of porous texture. It also presents longitudinal elasticity (30-50%), which facilitates the adhesion when in contact with the surface of the skin. Depending on the area of application, it can be used for several days, without losing its properties[19].

The bandage has the ability to stretch, without the presence of medicine drugs in its composition[4]. The basic principles of the elastic bandage performance are: correction of motor function of weak muscles, increase of blood and lymphatic circulation and enlargement of proprioception through the estimation of cutaneous mechanoreceptors[20].

In general, the application of the elastic bandage can increase the motor control, as well as activate the desired musculature. The bandage should be applied over the intended area, with the muscles in the maximum stretching position[20].

Although there is little research on the effectiveness of elastic bandaging in neurological patients, this technique has been used in recent clinical practice aiming at improving oral control of children with neurological disorders, when applied in the supra-hyoid region and orbicularis of the mouth. Thus, a reduction in sialorrhea and an improvement in the lip seal are expected.

Some researchers[3,21-23] reported positive results in their studies, evidencing the improvement of swallowing and reduction of sialorrhea after the use of bandage in children with cerebral palsy. It should be noted that, although elastic bandaging was effective in controlling sialorrhea during its period of use, no results were observed after its discontinuation[23].

Considering the lack of experimental clinical studies regarding the use of elastic bandage as a Speech, Language and Hearing Sciences resource, this study aimed to verify the efficacy of elastic bandaging in the supra-hyoid muscles in patients with cerebral palsy.

Method

The project was registered in the Plataforma Brasil and approved by the Research Ethics Committee of the Universidade Federal de Sergipe, under the CAAE number: 46785115.4.0000.5546. The participants were informed about the objectives of the research and their caregivers signed, after clarification, the Free and Informed Consent Term.

It is a prospective clinical study conducted for two consecutive months.

Patients were screened at Associação de Pais e Amigos dos Excepcionais (APAE), Aracaju, Sergipe, which attends subjects with Cerebral Palsy, and both the institution and the caregivers accepted to participate in the study.

The eligibility criteria adopted for **inclusion** were a confirmed diagnosis of Cerebral Palsy, clinical manifestations suggesting sialorrhea, accumulation of saliva in the oral cavity with continuous need for elimination and oral escape of saliva, presenting a minimum staging of level IV[16]. The criteria for **exclusion** were the use of other types of treatment for a minimum period of six months to control sialorrhea (prior Speech, Language and Hearing Sciences therapy, drug use, botulinum toxin application or previous use of elastic bandages) and faults exceeding 20% during the application of the bandage, besides the presence of allergy by the application of the elastic bandage.

The sample was divided into two groups: assisted waiting (that did not receive the procedure) and the experimental group, which used an elastic bandage. Initially, ten participants met the eligibility criteria for Experimental Group. However, considering the exclusion criteria, six subjects were excluded from the sample. One for presenting an allergic condition after the bandage's use, and five for faults during the application of the elastic bandage. Therefore, four subjects completed the sessions with elastic bandage application.

The **assisted waiting** group (AE) consisted of four patients with cerebral palsy. In these patients, the elastic bandage was not applied, and

they were given guidelines for passive maneuvers in the region of the supra-hyoid musculature and verbal commands for swallowing. The patients in this group presented ages ranging from three to seven years old (average of 4.25 years old ± 1.89 of standard deviation), distributed equally between the sexes.

The **experimental** group (EG) was also composed of four patients with cerebral palsy. In these patients, only the elastic bandage was applied. The patients in this group presented an age range of four to twelve years old (average of nine years old ± 3.55 of standard deviation), two boys and two girls.

Before starting the intervention with the elastic bandage, four protocols were applied to the caregivers:

The questionnaire on Quality of Life[6], considered an improvement when at least three of the responses were changed from "frequently" to "never" in the post-application period of the bandage;

Questionnaires on the control of saliva swallowing[3, 23], consisting of 20 closed questions related to: motor skills; head, mouth, lips and tongue position; feeding; swallowing; sensation; behavior and oral health; with the inclusion of an open question, regarding the number of towels used by the patient per day to wipe the saliva;

Protocol on the frequency and severity of sialorrhoea[3], with a score of one to four points, where: 1 point was attributed when the patient did not present sialorrhea (being excluded from the study); 2 points –the patient occasionally drool; 3 points –the patient often drools and 4 points – constantly drools. In the scale referring to severity, there is the possibility of five points, namely: 1 point - normal; 2 points - light; 3 points - moderate; 4 points - severe and 5 points - deep, which were answered by the caregivers. For the analysis of the results, the checklists and the questionnaires were compared at the beginning and at the end of the research, in both groups.

Finally, the Severity and Frequency Scale of sialorrhea was applied in patients with neurological diseases[24] and the proposed staging. This protocol initially analyzes the severity of sialorrhea, using the following scores: Dry - without sialorrhea (1); Wet - wet lips only (2); Moderate - lips and neck (3); Severe - compromises clothes (4) and Profuse - moist clothes, hands and objects (5). As for the analysis of the frequency of sialorrhea, the scores used were: Nosialorrhea (1), Occasional (2), Frequent (3) and Constant (4).

In order to facilitate the classification of the patients, a staging[25]was proposed based on the aspects mentioned above, in which the following classifications were established according to the scores obtained: Dry and without sialorrhea (I), Wet / moderate and occasional (II), Moderate and frequent / constant (III) and Severe / profuse and occasional / frequent / constant (IV).

The elastic bandage was considered effective when the total score number obtained after the procedure was equal to or greater than three. One point was attributed to the improvement in quality of life, one point when there was a decrease in the use of cloths or towels, one point when the patient decreased at least one point regarding the frequency and severity of sialorrhea, and finally, one point when there was a change in at least one level in sialorrhea staging.

Twenty-four applications of the KinesioTex-TapeTM elastic bandage were performed in the supra-hyoid muscle region (anterior venter of the digastric muscle and milo-hyoid muscle) in all patients who met the inclusion criteria. The application was performed by the speech therapist responsible for the research, in 5 x 2.5 cm strips, with maximum stretch at their movable points, laterally in the supra-hyoid region and as neutral point, in the center of the point of greatest tension of the anterior venter of the digastric muscle, detected by palpation during spontaneous deglutition.

The bandage changes were performed three times a week, with a two-day interval between them, with the intention of not intentionally removing the material in this interval. Thus, the patients remained for ninety continuous days with the bandage applied in the region of the supra-hyoid musculature.

The results were analyzed qualitatively, based on the comparison between the questionnaires performed before and after the application between AW and EG.

Results

Table 1 shows the results obtained related to the quality of life of the groups participating in the research, while Chart 1 shows the number of towels used by the caregivers responsible for cleaning hands, objects and the mouth of patients due to sialorrhea.

Table 1. Results obtained in the application of the quality of life questionnaire in the two groups participating in the research after the intervention

Quality of Life/Groups	Assisted Waiting		Experimental	
	N	%	N	%
Improved	0	0%	4	100%
Remained with the same score	4	100%	0	0%

Chart 1. Number of towels used by the responsibles of the two research groups at the moments pre- and post-speech, language and hearing sciences intervention

Subjects/ Groups	Assisted Waiting		Experimental	
	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
1	Between 3 and 4 towels	Between 3 or 4 towels	3 towels	1 towels
2	2 or 3 towels	2 or 3 towels	5 towels or more	3 towels
3	5 or more towels	5 or more towels	3 towels	1 towel
4	5 or more towels	5 or more towels	3 towels	1 towel

According to the Sialorrhea Frequency Scale, the EG participant No. 1 often drooled before the elastic bandage treatment, while patients 2, 3 and 4 were constantly drooling. After the bandage applications, the four participants started to drool occasionally. In none of the patients the total reduction of sialorrhea occurred. In the AW group, three patients drooled constantly and occasionally. After completion of the study, there was no change in the frequency of sialorrhea in this group.

Regarding the severity scale, in relation to the EG patients, two participants presented it moderately before the application of the bandage, one deep and the other severe. However, after the sessions, the severity of the sialorrhea of two patients became mild and the other two, moderate. In all patients, there was a significant improvement in sialorrhea with the use of elastic bandage, however, in none of the cases, occurred a reduction to the normal degree. In the AW group, however, there was no decrease in severity, with three participants presenting a deep degree and one, mild.

Results of staging of sialorrhea are available in Table 2.

In order to analyze the effectiveness of the procedure adopted between the groups, the scores provided in Table 3 were obtained.

Table 2. Staging of the sialorrhea between the research groups at the beginning and at the end of the procedure adopted

Subjects/ Groups	Assisted Waiting		Experimental	
	Initial Staging	Final Staging	Initial Staging	Final Staging
1	IV	IV	IV	II
2	IV	IV	IV	II
3	IV	IV	IV	II
4	II	II	IV	II

Table 3. Score obtained between the groups by the analysis of the effectiveness of the procedures adopted

Subjects/Effectiveness Analysis	Score obtained	
	Assisted Waiting	Experimental
1	0	4
2	0	4
3	0	4
4	0	4

Discussion

The quality of life (QoL) of a subject can be influenced by extrinsic and intrinsic factors and neurological disorders can affect both the QoL of the patients themselves and their relatives.

All the patients in the study presented motor limitations of the upper and lower limbs. Although in a heterogeneous way, that is, some with a greater limitation of lower limbs than superior limbs, or others with greater difficulty on one side than the other on the body, it implied different motor impairments and impairments in functional independence, consequently, with greater or lesser impact of this aspect on the QoL. Therefore, a questionnaire with an easy application was chosen and, in a simple and fast way, regardless of the severity of motor impairment, the focus was on the involvement of sialorrhea in the QoL.

Therefore, the QoL[6] questionnaire was used, containing four questions in the pre- and post-application of botulinum toxin in the parotid and submandibular glands in patients with amyotrophic lateral sclerosis. It was considered successful in the application treatment and the quality of life when at least three of the responses from the pre-application period were changed from "often" to "never" in the post-application phase of the toxin.

It was possible to verify that, without direct intervention, family members tend not to comply with the guidelines provided, either due to forgetfulness, difficulties in performing guided maneuvers or lack of interest / motivation, as can be proven by the AW group.

In addition, those who were followed for two months (EG), besides having the opportunity to have their doubts explained in the moments in which they were in contact with a professional, received the elastic bandage, which helped the family members' perception of their children's QoL improvement. The treatments that improve the control of saliva swallowing tend to improve the QoL of patients who present sialorrhea, according to the literature[6].

A qualitative research with mothers of children with CP about the QoL of their children showed that the financial aspects and the development of activities of daily living are aspects that, in the opinion of the participants, interfere in the QoL of these patients[26]. In addition, the follow-up by specialists favors an improvement in QoL, since the family perceives that such treatments beneficially affect the health status and progress of the child[27], as may have occurred with the EG of this study.

The measurement of the amount of saliva in the intraoral cavity can be performed by sialometry, a technique that consists in placing cotton swabs inside the mouth, after the request of the evaluator; thus, the patient performs directed swallowing of saliva, so that after two minutes, it becomes a heavy wad. Sialometry and the sialochemical analysis provide useful information for the diagnosis and treatment of subjects with CP, since swallowing may be compromised by the incoordination of the body muscles, including the head and neck, increasing the risk of installing oral diseases in these patients[28].

Regarding its importance, the research using sialometry was performed with patients with CP[15] in order to prove, more objectively, that from the use of elastic bandage in supra-hyoid muscles for one month, derived a greater control of swallowing, causing a decrease in sialorrhoea, proven by sialometry. In this study, sialometry was initially attempted, however, because of the presence of pathological reflexes (bite) or because, due to the hypersensitivity to the cotton stimulus in the intraoral cavity, the patients made movements with their tongues, trying to remove the cotton from the mouth, making the execution of the test previously designed for such purpose impossible.

Normal primitive reflexes during child development, which usually disappear over time, remain in subjects with CP, altering and preventing the voluntary acquisition of oral functions, such as chewing and control and swallowing of the bolus. So that, therapeutic procedures (either with inhibition of pathological reflexes, adequacy of muscle tone or adequate positioning) are required in these situations[29].

On the other hand, researchers[22] report benefits for the control of saliva swallowing through the use of elastic bandage, with results similar to that of this study, with also a decrease in the use of towels, as reported by the mothers in this study. The use of elastic bandage in supra-hyoid and orbicularis musculature of the mouth, associated with traditional Speech, Language and Hearing Sciences therapy for three months in a child with CP, revealed satisfactory results on the reduction of sialorrhea[4].

From the analysis of the results of the research, it was possible to observe the effectiveness of the elastic bandage in the reduction of sialorrhea during the treatment period. A significant decrease in sialorrhea can be noted in all subjects of the EG, unlike those who did not receive the bandage (AW). When compared, the questionnaires answered by the caregivers before the first application presented a significant improvement in frequency, severity and seriousness of sialorrhea.

Thus, it can be affirmed that the application of the bandage directly influences aspects related to the quality of life of Cerebral Palsy patients, such as: reduction of the constant elimination of saliva from the oral cavity; the possibility of participating in meals with the family; and especially, the possibility of physical contact on the face, without generating a constraint, especially in public environments.

The caregivers also reported daily changes. Some said they no longer had to change clothes several times during the day. In addition, some cases reported that the bandage provided the lip seal. Thus, according to the results obtained in the EG, it is possible to affirm that the use of elastic bandage in the supra-hyoid region contributed to the control of swallowing saliva, since the bandage assisted in the swallowing process involuntarily and non-invasively, that is, without the patient needing to make any effort or feeling pain.

The need for a continuous use of the bandage is identified, so that, the result is definitive, because although it helps to control the involuntary swallowing of saliva, it has not been proven that the use of this procedure results in long-term results, as stated in the literature[23].

It is worth noting that this technique is not invasive and it is relatively accessible to those who present sialorrhea, taking into account the improvement in the reported quality of life.

It is also important to note that no patient made specific drug use for the treatment of sialorrhea, presenting xerostomia or dry mouth as side effects of its use[15]. This effect could imply a confounding factor in the analysis of the studied variables, hindering the reliability of the analysis of the results of the present study.

Finally, there is a need to reflect about invasive procedures for the control of sialorrhea, such as the use of drugs with anti-cholinergic effects, antiparkinsonian drugs, surgical treatment of salivary ducts or glands, radiotherapy in the salivary glands and the application of botulinum toxin type A in the salivary glands. It is important since non-invasive methods can have beneficial effects.

Recent studies[3,23,30] have shown, as well as this one, the benefits of using elastic bandaging in patients who present sialorrhea, even when applied to different regions (suprahyoid muscle [3,23] or orbicularis of the mouth[30]) - whether or not there is maintenance of the benefits obtained when the bandage was removed. One study found that there was no maintenance of the reduction of sialorrhea - justifying the continuity of research in the area.

In addition, the presence of a child with cerebral palsy in the family environment promotes strenuous and tiring changes in the life routines, requiring a greater time to attend to the demands of this child, with the possibility of using the elastic bandage to favor the decrease of this demand. It is a simple and non-invasive method, being a resource to be taken into consideration in the therapeutic planning of patients with this condition.

Conclusion

The elastic bandage in supra-hyoid muscles proved to be effective for the control of sialorrhea in the patients of this study, favoring improvements in the quality of life of these subjects. However, the time of use of the elastic bandage necessary for the sialorrhea to be extinguished has not been delimited, as well as if the patients, after removal of the bandage, maintain the results stable, being necessary the use of longitudinal researches for the verification of such effects.

References

1. Douglas CR. Fisiologia da secreção salivar. In Douglas CR (Org.). Fisiologia aplicada à Fonoaudiologia. Rio de Janeiro: Guanabara-Koogan; 2006. p. 302-15.

2. Jensen SB, Pedersen AML, Vissink A, Andersen E, Brown CG, Davies AN, et al. A systematic review of salivary gland hypofunction and xerostomia induced by cancer therapies: prevalence, severity and impact on quality of life. Support. care cancer. 2010; 18(8): 1039-60.

3. Ribeiro MO, Rahal RO, Kokanj AS, Bittar DP. O uso da bandagem elástica Kinesio no controle da sialorréia em crianças com paralisia cerebral. Acta fisiátrica. 2009; 16(4): 168-72.

4. Silva AP. O uso da bandagem elástica no tratamento da sialorréia em criança com paralisia cerebral: relato de caso. 39. Congress of the International Association of Orofacial Myology; 2010 Ago 27-29; São Paulo. São Paulo: IAOM; 2010.

5. Erasmus CE, Van Hulst K, Rotteveel LJ, Jongeruis PH, Van DenHoogen FJ, Roeleveld N, et al. Drooling in cerebral palsy: hypersalivationordysfunctional oral motor control? Dev Med Child Neurol. 2009; 51: 454-9.

6. Magalhães EB. O corpo rebelado: dependência física e autonomia em pessoas com paralisia cerebral [tese]. Fortaleza (CE): Universidade Federal do Ceará; 2012.

7. Fonseca LF, Melo RP, Cordeiro SS, Teixeira MLG. Encefalopatia crônica (paralisia cerebral). In: Fonseca LF, Xavier CC, Pianetti G. (Org.). Compêndio de neurologia Infantil. 2 ed., Rio de Janeiro: Medbook. p. 669-79.

8. Senner JE, Logemann J, Zecker S, Gaebler-Spira D. Drooling, saliva production, and swallowing in cerebral palsy. Dev. med. child. neurol. 2004; 46: 801-6.

9. Chávez MCM, Grollmus ZCN, Donat FJS. Clinical prevalence of drooling in infant cerebral palsy. Med. oral patol. oral cir. bucal 2008; 13(1): E22-6.

10. Walsh M, Smith M, Pennington L. Interventions for drooling in children with cerebral palsy. Cochrane database syst. rev. 2012; 2(2): 1-52.

11. Van Hulst K, Lindeboom R, van der Burg J, Jongerius P. Accurate assessment of drooling severity with the 5-minute drooling quotient in children with developmental disabilities. Dev. med. child. neurol. 2012; 54(12): 1121-6.

12. Crysdale WS. The drooling patient: evaluation and current surgical options. Laryngoscope. 1980; 90(5): 775-83.

13. Manrique D, Brasil OOC, Ramos H. Evolução de 31 crianças submetidas à ressecção bilateral das glândulas submandibulares e ligadura dos ductos parotídeos para controlar a sialorréia. Rev. bras. otorrinolaringol. 2007; 73(1): 41-5.

14. Silvestre-Rangil J, Silvestre FJ, Puente-Sandoval A, Requeni-Bernal J, Simó-Ruiz JM. Clinical-therapeutic management of drooling: review and update. Med. oral patol. oral cir. bucal 2011;16(6): e763-6.

15. Dias BLS, Fernandes AR, Maia Filho HS. Sialorrhea in children with cerebral palsy. J. pediatr. 2016; 92(6): 549-58.

16. Araújo GJS, Simões RA, Cavalcante MLC, Moraes MR,. A aplicabilidade do recurso Kinesio Taping® nas lesões desportivas: uma revisão de literatura. Revista Pesquisa em Fisioterapia. 2014; 4(3): 189-96.

17. Artioli DP, Bertolini GRF. Kinesio taping: aplicação e seus resultados sobre a dor: revisão sistemática. Fisioter. pesqui. 2014; 21(1): 94-9.

18. Silva AP. Bandagem elástica no músculo trapézio em adultos saudáveis [dissertação]. São Paulo (SP): Pontifícia Universidade Católica de São Paulo; 2015.

19. Saa PAC, Martínez GAC. Efectos del vendaje neuromuscular: una revisión bibliográfica. Rev. cienc. salud 2012; 10(2): 273-84.

20. Kase K, Wallis J, Kaze T. Clinical therapeutic applications of the Kinesio Taping Method. 2nd ed. Tokyo; 2003.

21. Martin T, Yasukawa A. Use of kinesio tape in pediatrics to improve oral motor control. 18th Annual Kinesio Taping International Symposium Review; 2003; Tokyo, Japan: Kinesio Taping Association; 2003.

22. Jaraczewska E, Long C. Kinesio® taping in stroke: improving functional use of the upper extremity in hemiplegia. Top. stroke rehabil. 2006; 13(3): 31-42.

23. Caneschi WF, Paiva CCAN, Frade RL, Motta AR. Uso da bandagem elástica associada ao tratamento fonoaudiológico no controle da sialorréia. Rev. CEFAC. 2014; 16(5): 1558-66.

24. Costa C, Ferreira J. Aplicação de toxina botulínica nas glândulas salivares maiores para o tratamento de sialorréia crônica. Rev. bras. cir. cabeça pescoço 2008; 37(1): 28-31.

25. Thomas-Stonell N, Greenberg J. Three treatment approaches and clinical factors in the reduction of drooling. Dysphagia. 1988; 3(2): 73-81.

26. Vasconcelos VM, Frota MA, Pinheiro AKB, Gonçalves MLC. Percepção de mães acerca da qualidade de vida de crianças com paralisia cerebral. Cogitare enferm. 2010; 15(2): 238-44.

27. Pupo DB, Bussoloti Filho I, Liquidato BM, Korn GP. Proposta de um método prático de sialometria. Rev. bras. otorrinolaringol. 2002; 68(2): 219-22.

28. Matsui MY, Ferraz MJPC, Gomes MF, Hiraoka CM. Alterações sialoquímicas e sialométricas de pacientes com paralisia cerebral: uma revisão de literatura. Rev. CEFAC. 2011; 13(1): 159-61.

29. Santini CRQS. Disfagia neurogênica. In: Furkim AM, Santini CRQS (Org.). Disfagias orofaríngeas. Barueri: Pró-Fono; 2008. p. 19-34.

30. Mikami, Denise Lica Yoshimura. Bandagem elástica no tratamento fonoaudiológico do escape salivar – sialorreia [dissertação]. Brasília (DF): Universidade de Brasília; 2016.