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Case Report

The Intervention of Physiotherapy in the improvement of facial mimicry in a Peripheral Facial Palsy associated with a Pregnancy: A Case Report

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Abstract: Peripheral Facial Palsy is a peripheral paralysis of the facial nerve that results in muscle weakness on one side of the face. Patients develop unilateral facial paralysis within one to three days with involvement of the facial musculature associated or not with neurological alterations, the best-known being Bell's Palsy. Symptoms usually peak in the first week and then gradually subside over three weeks to three months. In this context, a female patient with the clinical Diagnosis of Peripheral Facial Paralysis, was subjected to an intervention plan in Physiotherapy lasting 4 months (sessions of 45 minutes at a frequency of 3 times a week), with the particularity of be 28 weeks pregnant at the start of the sessions. After the end of the sessions, there was a considerable improvement in facial movements, translating into considerable functional changes. The patient acquired greater motor recruitment in flaccid muscles, greater facial symmetry, and consequently greater autonomy in eating, chewing, containing liquids and intraoral sensibility.

Keywords: Facial Palsy; Pregnancy; Techniques of Physiotherapy; Functional Performance.

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1. Introduction

Bell's palsy is an acute-onset peripheral facial neuropathy and is the most common cause of lower motor neuron facial palsy. The clinical presentation of the disorder is a rapid onset, unilateral, lower motor neuron-type facial weakness with accompanying symptoms of postauricular pain, dysgeusia, subjective change in facial sensation and hyperacusis. This clinical presentation can be explained by the anatomical construct of the human facial nerve, specifically its mixed nerve profile containing motor, sensory and parasympathetic fibres. The propensity for the facial nerve to form numerous connections with adjacent cranial nerves may also explain the occasionally observed features of altered facial sensation (cranial nerve V), vestibular dysfunction (cranial nerve VIII) or pharyngeal symptoms (cranial nerves IX and X) [1].

Reduced lacrimation and salivation secondary to parasympathetic effects may also occur. Maximal disability occurs within the first 48–72 h and the severity of the palsy correlates with the duration of facial dysfunction, the extent of facial recovery and impairment of quality of life [1, 2]. Most cases of Bell's palsy in pregnancy occur during the third trimester or the first week after childbirth and, in general, prognosis is worse than in non-pregnant women.23 The main treatment is corticosteroids, although steroids can be used safely during the third trimester of pregnancy, to minimise the risks to the foetus, it is

recommended that prednisolone or methylprednisolone be used, since they cross the placental barrier to a lesser. One of the most important treatments is Physiotherapy, to promote the functional recovery of patients through facial symmetry, improvement of activities of daily living but above all the improvement of facial aesthetics [3].

Other causes such as high blood pressure, diabetes mellitus, virus, and the puerperium are identified as associated conditions that can lead to this type of injury [3]. The degree of recovery of facial nerve function depends on the patient's age, type of injury, etiology, nerve nutrition, neuromuscular impairment, and instituted therapy 2. Recovery from facial nerve injury can take a few weeks, up to four years, in which the main approaches involve Medicine, but above all Physiotherapy. Physiotherapy is a health profession very important, which has as its main objectives the restoration of facial mimicry, muscle strength and tone, as well as intra and extra oral sensibility [3].

The objective of this study was to understand and value the contribution of Physiotherapy as one of the main strategies in the treatment of peripheral facial palsy, namely through the Kabat method, as well as to understand the level of motor and functional recovery considering pregnancy as one of the main etiological causes of this neurological condition.

2. Case Report

Patient referred from the specialty of Otorhinolaryngology with the diagnosis of left Peripheral Facial Palsy. As clinical antecedents, the patient was 28 weeks pregnant. From a motor point of view, there was significant flaccidity on the left hemiface (non-dominant side), with deviation of the labial commissure to the left side. With regard to muscle strength, the main muscles of facial mimicry were evaluated, revealing a grade 1 in the frontal muscle, buccinator and mouth orbicularis and grade 0 in the supraciliary muscle, orbicularis oculi, pyramidal of the nose, alar portion of the nose, great zygomaticus, risorius and mentonian.

He had a positive Bell's sign (absence of frontal wrinkles, inability to occlude the eye and deviation of the labial commissure). The right hemiface (dominant side) showed increased muscle tone, mainly at the level of the orbicularis oculi, pyramidal of the nose, zygomaticus major, risorius and mentalis. There was no difficulty in feeding, however, during the ingestion of liquids, the patient showed leakage through the left labial commissure. The patient showed changes in intraoral sensibility, resulting in greater difficulty in eating and chewing. In the initial sessions, some teaching was carried out regarding ocular occlusion during the night, application of artificial tears, as well as the performance of some exercises at home.

2.1 Procedures

The use of scales to measure the degree of impairment of facial paralysis has become increasingly routine in clinical practice. The need to establish a functional prognosis regarding the evolution of peripheral facial palsy, as well as helping in the intervention plan, have forced the use of methods to quantify it clinically, also as a way of valuing the intervention by the Physiotherapist [4]. In this specific case, the quantitative assessment was based on the House and Brackmann Scale [5], which, although subjective, was the most appropriate assessment instrument in this clinical condition.

The qualitative assessment was based on motor and functional assessment in Physiotherapy through observation of motor recruitment of the main muscles of the face, facial mimics, and functional performance in some activities of daily living. For a better understanding of the patient's functional condition, a photographic record was used, also as a way of observing the progression of the situation, as well as a form of motivation for the patient herself.

To this effect, a Physiotherapy program was implemented during a period of 4 months with three weekly sessions of 45 minutes, in which the following goals were proposed:

- Decrease the hypertonicity of the unaffected hemiface;
- Increase the muscle strength of the affected hemiface (go from one degree of muscle strength 0 to 1);
- Promote facial symmetry, improve facial symmetry and consequently gain oral functionality (improvements in basic functions such as fluid intake, chewing, articulation of words);
- Quantitatively, move from a grade VI (total paralysis) to a grade I (normal without dysfunction) on the House-Brackmann scale [5].

The intervention in this patient was based on an individual and personalized problem-solving approach, based on the best recommendations of clinical practice in this neurological condition. The intervention was essentially based on some sensorial stimulation strategies, such as *Massage Techniques, Kabat Method* [6] and *Rood Stimulation* [7]. Massage techniques with the main objective of decreasing the muscle tone of the hemiface not affected by its hyperactivity and increasing associated reactions. The Kabat method to promote sensorimotor input from the affected hemiface and consequently stimulate motor recruitment of flaccid musculature. Stimulation with ice also aimed at motor stimulation of the flaccid musculature, promoting the approximation of the muscle fibers. The treatment sequence is described in following figure 1 and figures 2A to 2D.

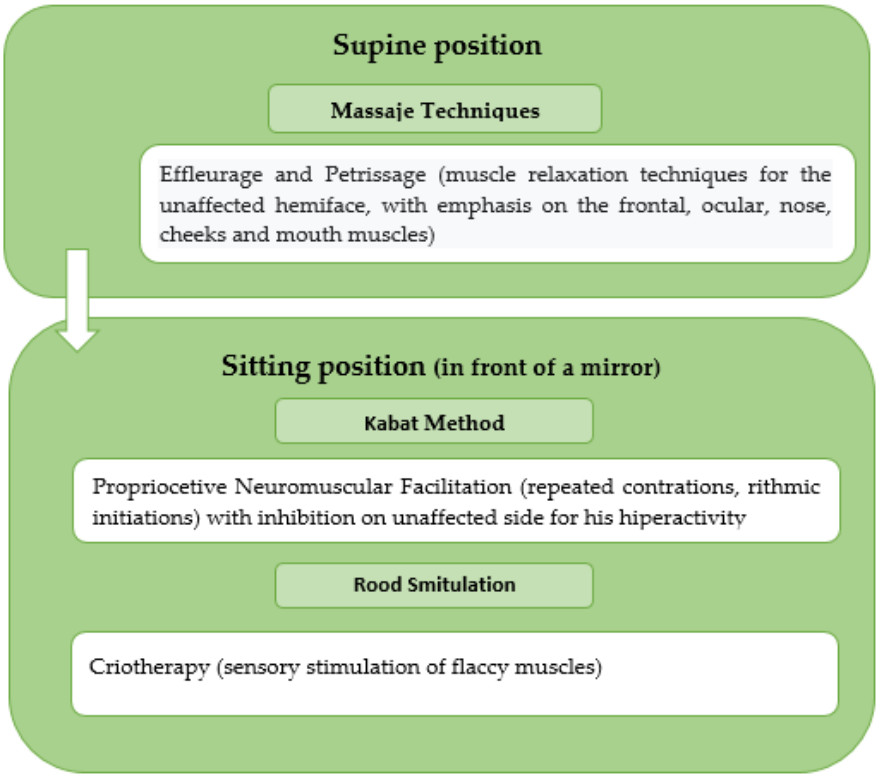

Figure 1: Type of strategies used in Intervention Plan of Physiotherapy (first in supine position and then in sitting position).

As an alternative strategy, the application of Kinesiotape was also used as a form of sensory stimulation and simultaneously promoting motor recruitment (Figure 2D). The use of the kinesiotape dressing in the treatment is indicated to promote muscular work, generating direct benefits in the orofacial functions [8]. This strategy is not a treatment,

but an important resource that complements the techniques used, due to its continuous action, enhancing the results of traditional therapy and helping to stimulate neuroplasticity [9].

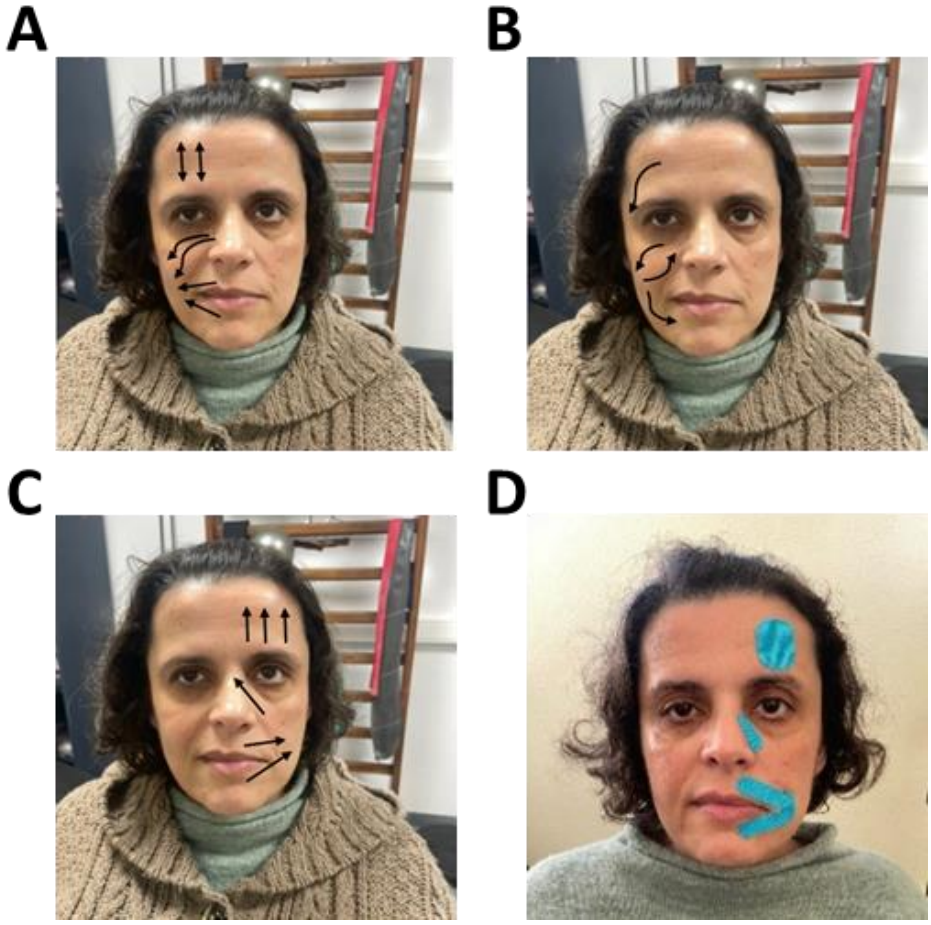

Figure 2: A and B. Application of Massage techniques (location and orientation). **C.** Application of Proprioceptive neuromuscular facilitation techniques and ice stimulation. **D.** Application of Kinesiotape bands (frontal muscle, pyramidal nose and orbicularis oris).

In order to continue the work carried out in the session, some simple exercises were advised, taking care not to exaggerate the number of repetitions, thus avoiding the appearance of synkinesis during them.

3. Results

After the intervention plan, the patient presented evident improvements from the motor point of view, in relation to the left hemiface (non-dominant side), namely in the presence of frontal wrinkles, activation of the pyramidal nose, orbicularis oculi and mouth muscles (degree 1 muscle strength) (Figure 3A to 3D). Although in the end, some flaccidity of the facial musculature is still evident, it demonstrates an improvement in the motor response at all levels. At the time of the evaluation, he maintained some hyperactivity on the unaffected side as the main difficulty. Functionally, he did not mention a problem with fluid intake, showing symmetry in the labial commissure.

Regarding the quantitative method, an evolution was noted in the House and Brackmann Scale, going from level VI to level II (slight weakness notable only on close inspection; there may be very slight synkinesis; at rest: facial symmetry and normal muscle tone;

the forehead movement reveals good to moderate function, the eye reveals complete occlusion with minimal effort and the mouth with a slight asymmetry.

Figure 3: A. Evident improvement in labial commissure deviation, translating into greater motor recruitment of the risorius muscle and greater effectiveness and functionality in the "smile". **B.** Final evaluation; evident improvement in the recruitment of the orbicularis oculi muscle, translating into greater efficiency and functionality in ocular occlusion on the left. **C.** Final evaluation; evident improvement in the motor recruitment of the orbicularis oris muscle, translating into greater efficiency in the anterior projection of the lips and functionality in the functional activity "kiss". **D.** Final evaluation; evident improvement in the motor recruitment of the frontal muscle, translating into a greater presence of frontal wrinkles and functionality in the functional activity "face of astonishment".

4. Discussion

Bell's palsy is an acute peripheral facial neuropathy, with a clinical presentation of rapid and sudden onset, unilateral, which leads to a high disabling degree, as seen in this patient [10]. The literature also reports other symptoms such as reduced lacrimation and secondary salivation which are parasympathetic effects. The onset of this sudden condition occurred within the first 48 hours and its severity largely depends on the duration of facial dysfunction, extent of facial recovery and consequent decrease in quality of life. This clinical situation aggravated the patient's psychological state, resulting in poor motivation and negative thoughts, added to the fact that she was pregnant.

Despite the immense existing literature on this clinical condition, the pathogenesis of Bell's Palsy is still controversial today. Infection (herpes simplex type-1), nerve compression and decreased autoimmunity may all play a role, however the exact sequence and magnitude of these influences remains nuclear [11]. The incidence of this clinical situation is higher in situations of pregnancy, after a viral infection of the upper respiratory tract, changes in the immune system, diabetes mellitus and hypertension, and in this specific situation, pregnancy may have been an important factor that pre-established the occurrence of the neurological condition [12].

Currently, scientific evidence demonstrates a possible relationship between facial palsy and pregnancy, reinforcing the idea of Charles Bell (the surgeon who gave the name to the neurological condition) who has always addressed this fact, and current research is focused on stablishing the incidence of Bell's palsy in pregancy population [11, 12]. There are several known risk factors for Bell's palsy, pregnancy being one of them. In a study of pregnant women (242,000 deliveries), 0.17% of pregnant women were diagnosed with Bell's palsy [13, 14].

Facial paralysis graduation uses many systems widely known worldwide to record the severity of paralysis, two of them are the House-Brackmann (HB) scale or the Facial Nerve Grading Scale (also known as the Sunnybrook system). The subjective nature of these scales contributes to some misinterpretation, however their ease of use has cemented their role in clinical practice for communicating the overall degree of dysfunction, for monitoring results and for presenting group data in a search. In this case, with the aim of quantifying the evaluation and subsequently the results, we choose the House-Brackmann scale [4].

Patients with complete facial paralysis (on the House-Brackmann Scale: grades 5-6) who do not experience some recovery in the first 3-4 months after onset are more likely to have incomplete recovery of facial function, with or without spasms and synkinesias [15], however, in this case, despite the seriousness of the situation, the patient showed significant improvements in the first three weeks, corroborating the importance of physiotherapy intervention. It was found that in most sequelae of facial nerve paresis there was a significant improvement in terms of disability and quality of life 16, reinforcing the important contribution of physiotherapy in functional evolution through the application of facial strategies and facial mime exercises [17, 18]. In this specific case, facial asymmetry at rest decreased, as well as the presence of synkinesis, and consequently a decrease in pain symptoms, stiffness, increased motor recruitment, changes in sensibility, and functional improvement in food, speech, and quality of life.

The practice of facial mimicry is one of the most common forms of Physiotherapy, associated with massage, relaxation exercises, inhibition of synkinesis, and expressive emotional exercise [19]. Several studies refer to the important contribution of Physiotherapy in the functional recovery of these patients, namely in the improvement of the facial performance assessed by the House-Brackman Scale [20, 21].

The use of Kinesiotape is indicated to promote muscle work, generating direct benefits in orofacial functions, not being a treatment, it is an excellent resource that complements the techniques used, enhancing the results of Physiotherapy, and helping to stimulate neuroplasticity [22]. Studies that investigated the effects of using Kinesiotape in the treatment of patients with neurological disorders showed that the main benefits were the

improvement in proprioception and the normalization of muscle function where the bandage was applied [23]. The use of Kinesiotape proved to be an excellent tool in this clinical situation, contributing to the continuity of the work carried out in the context of the session, as well as to the maintenance of functional results.

5. Final considerations

After the end of the sessions, the patient showed great satisfaction with the goals achieved, considering her initial expectations, referring a great improvement in facial symmetry, facial mimicry but above all in the improvement in other functions, such as feeding, chewing, liquid containment. Recovery of facial nerve function is an important outcome that guides treatment recommendations. The initial severity of changes in facial expression provides fundamental prognostic information for facial recovery. Patients with mild to moderate paresis demonstrated higher recovery rates than those with severe or complete paresis [24]. In this specific case, despite the low representation of a case study at a statistical level, the patient who had total paralysis at the beginning, showed significant improvements, going to a mild dysfunction at the end, failing to achieve one of the goals regarding the grade on the House-Brackmann Scale.

Despite pregnancy being an important factor for the occurrence of facial paralysis, the patient maintained the sessions until the end of the pregnancy, continuing the intervention plan even after the delivery, because in addition to being motivated, she realized the real contribution of physiotherapy in her case. Despite some controversy in the application of Kinesiotape bands due to its subjectivity, in this case it proved to be an excellent strategy in the recovery and maintenance of facial muscle function [25].

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Research Ethics Committee Approval: We declare that the patient approved the study by signing an informed consent form and the study followed the ethical guidelines established by the Declaration of Helsinki

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Conflicts of Interest: None.

Supplementary Materials: None.

References

1. Eviston TJ, Croxson GR, Kennedy PG, Hadlock T, Krishnan AV. Bell's palsy: aetiology, clinical features and multidisciplinary care. J Neurol Neurosurg Psychiatry. 2015 Dec;86(12):1356-61. doi: 10.1136/jnnp-2014-309563. Epub 2015 Apr 9. PMID: 25857657.
2. Babl FE, Herd D, Borland M, Kochar A, Lawton B, Hort J, West A, George S, Zhang M, Velusamy K, Sullivan F, Oakley E, Davidson A, Hopper SM, Cheek JA, Berkowitz R, Hearps S, Wilson CL, Williams A, Elborough H, Legg D, Pharm B, Mackay MT, Lee KJ, Dalziel SR; Paediatric Research in Emergency Departments International Collaborative (PREDICT). Efficacy of Prednisolone for Bell Palsy in Children: A Randomized, Double-Blind, Placebo-Controlled, Multicenter Trial. Neurology. 2022 Aug 25:10.1212/WNL.0000000000201164. doi: 10.1212/WNL.0000000000201164. Epub ahead of print. PMID: 36008143.
3. Lassaletta L, Morales-Puebla JM, Altuna X, Arbizu Á, Arístegui M, Batuecas Á, et al. Parálisis facial: guía de práctica clínica de la Sociedad Española de ORL. Acta Otorrinolaringol Esp. 2020;71:99–118.
4. Fonseca KMO, Motta, AR, Mourão AM, Vicente LCC. Scales of degree of facial paralysis: analysis of agreement. Braz J Otorhinolaryngol. 2015; 81(3): 288-293.
5. Marsk E. Bell's palsy - study design, prognosis and quality-of-life, Karolinska Institutet. Estocolmo: 2012.
6. Barbara M, Antonini G, Vestri A, Volpini L, Monini S. Role of Kabat physical rehabilitation in Bell's palsy: a randomized trial. Acta Otolaryngol. 2010;130:167-172.
7. Mishra SS, Sayed M. Effects of Mime Therapy with Sensory Exercises on Facial Symmetry, Strength, Functional Abilities, and the Recovery Rate in Bell's Palsy Patients. Function and Disability Journal. 2021; 4:E35;.
8. Silva AP, Escamez NES, Morini N Jr, Silva MAA. Therapy Taping® Method: therapeutic taping as a therapeutic resource in the Speech Language clinical practices. Distúrb Comun. 2014;26(4):805-8.
9. Barreto SR, Chaves TS, Mourão AM, Vicente LCC. The use of kinesio taping in the treatment of the acute phase of post-stroke facial paralysis Audiol Commun Res. 2021;26:e2462.

10. Barbatto LM, Perez VO, Portella DO. Perfil Etiológico de pacientes com Paralisia Facial Periférica atendidos num Programa de Reabilitação. Colloquium Vitae. 2015; 7(Especial):58-65.
11. Croxson GR, Eviston TJ, Hadlock T, Kennedy PGE, Krishnan AV. Bell's palsy: aetiology, clinical features and multidisciplinary care. J Neurol Neurosurg Psychiatry 2015; 86: 1356–1361.
12. Gillman GS, Klein SR, May M, Schaitkin BM. Bell's palsy in pregnancy: A study of recovery outcomes. Otolaryngol Head Neck Surg 2002;126: 26-30.
13. Katz A, Sergienko R, Dior U, Wiznitzer A, Kaplan DM, Sheiner E. Bell's palsy during pregnancy: is it associated with adverse perinatal outcome? Laryngoscope. 2011;121:1395-1398.
14. Savadi-Oskouei D, Abedi A, Sadeghi-Bazargani H. Independent role of hypertension in Bell's palsy: a case-control study. Eur Neurol. 2008;60:253-257.
15. Marsk E. Bell's palsy - study design, prognosis and quality-of-life, Karolinska Institutet. Estocolmo: 2012.
16. Beurskens CHG, Heymans PG. Physiotherapy in Patients with Facial Nerve Paresis: Description of Outcomes. American Journal of Otolaryngology, 2004;25(6):394-400.
17. Beurskens CH, Heymans PG. Mime therapy improves facial symmetry in people with long-term facial nerve paresis: a randomised controlled trial. Aust J Physiother. 2006;52:177-183.
18. Beurskens CH, Heymans PG, Oostendorp RA. Stability of benefits of mime therapy in sequelae of facial nerve paresis during a 1-year period. Otol Neurotol. 2006;27:1037-1042.
19. Cardoso JR, Teixeira EC, Moreira MD, Favero FM, Fontes SV, Bulle de Oliveira AS. Effects of exercises on Bell's palsy: systematic review of randomized controlled trials. Otol Neurotol. 2008;29:557-560.
20. Baugh RF et al. Clinical Practice Guideline: Bell's Palsy. Otolaryngology– Head and Neck Surgery 149 (3S) S1–S27. American Academy of Otolaryngology—Head and Neck Surgery Foundation 2013.
21. Almeida JR et al. Management of Bell palsy: clinical practice guideline. Canadian Medical Association Journal, 2014.
22. Silva AP, Escamez NES, Morini N Jr, Silva MAA. Therapy Taping® Method: therapeutic taping as a therapeutic resource in the Speech Language clinical practices. Distúrb Comun. 2014;26(4):805-8.
23. Barreto SR, Chaves TS, Mourão AM, Vicente LCC. The use of kinesio taping in the treatment of the acute phase of post-stroke facial paralysis Audiol Commun Res. 2021;26:e2462.
24. Khatkhate N, Tiemstra JD. Bell's Palsy: Diagnosis and Management. Volume 76, Number 7. University of Illinois, Chicago: 2007.
25. Sun Zh, Tian Yp, Tan Yf, Tao D, Li Wb, Ding Jl, Ai Sc. Effectiveness of Kinesio taping on peripheral facial paralysis: a protocol for systematic review and meta-analysis. Medicine 2020;99: 46 (e23090).