

Comparison study between Russian current and radiofrequency in abdominal flaccidity: Literature review

Estudo comparativo entre corrente russa e radiofrequência na flacidez abdominal: Revisão bibliográfica

Estudio comparativo entre corriente rusa y radiofrecuencia en flacidez abdominal: Revisión bibliográfica

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Abstract

Introduction: The skin is a biological component and main organ of the external environment and has a viscoelastic action with the property of being remodeled under pressure that operates against the tissue. Muscle flaccidity is due to an increase in muscle tone, with the muscle having less resistance. The handled is handled in the treatment of sagging cut, this resource produces the improvement of the skin by reconditioning the elasticity and the capacity of tension of the tissues generating an elevation of perfection. Russian current, made up of rectangular or sinusoidal, bipolar, symmetrical current pulse trains transmits a frequency of 2,500 hertz modulated by a wave that can alternate from 50 to 80 hertz. **Objective:** To observe the effectiveness of the use of radiofrequency comparing with the Russian current in improving abdominal flaccidity. **Methodology:** This is a bibliographic study with comparative articles between the selected bibliographic techniques. Results: selected were selected based on the words, and without the title in question, inclusion and exclusion criteria, and based on analysis which of the chosen techniques were the best. in the literature, they have several satisfactory results in relation to electrostimulation, as it improves the capacity of muscle function and describes the main objectives of the technique. **Conclusion:** It is concluded that the techniques are studies for abdominal flaccidity, however, there are still few recent studies on the techniques studied.

Keywords: Abdominal flaccidity; Radio frequency; Russian chain.

Resumo

Introdução: A pele é um componente biológico e principal órgão do meio exterior e de ação viscoelástico com propriedade de se remodelar sobre pressão que efetua contra o tecido. A flacidez muscular acontece devido a diminuição do tônus muscular, estando o músculo com resistência reduzida. A Radiofrequência é manuseada no tratamento de flacidez cutânea, esse recurso produz o recondicionamento da pele aperfeiçoando a elasticidade e a capacidade tensora dos tecidos gerando uma diminuição da flacidez. A corrente russa, é constituída por trens de impulsos de corrente do tipo retangular ou senoidal, bipolar, simétrica, oferta uma frequência de 2.500 hertz modulada por uma onda que pode variar de 50 a 80 hertz. **Objetivo:** Observar a eficácia do uso da radiofrequência comparando com a corrente russa na melhoria da flacidez abdominal. **Metodologia:** Trata-se de um estudo bibliográfico com intuito comparativo entre as técnicas descritas nos artigos selecionados. **Resultados:** Foram selecionados artigos com

base nas palavras-chave, e no título em questão, critérios de inclusão e exclusão, a amostra se baseia em analisar qual das técnicas estudadas obteve melhores resultados. Na literatura, existe vários resultados satisfatórios em relação a eletroestimulação, pois a mesma auxilia a capacidade da função muscular e descrevem os principais objetivos da técnica. Conclusão: Conclui-se que as técnicas são eficazes para a flacidez abdominal, contudo ainda há poucos estudos recentes sobre as técnicas estudadas.

Palavras-chave: Flacidez abdominal; Radiofrequência; Corrente russa.

Resumen

Introducción: La piel es un componente biológico y el principal órgano del medio externo y viscoelástico con la propiedad de remodelarse bajo presión aplicada contra el tejido. La flacidez muscular se produce debido a la disminución del tono muscular, teniendo el músculo una resistencia reducida. La radiofrecuencia se utiliza en el tratamiento de la flacidez cutánea, este recurso reacondiciona la piel, mejorando la elasticidad y capacidad tensora de los tejidos, generando una disminución de la flacidez. La corriente rusa consiste en trenes de impulsos de corriente simétricos, bipolares, rectangulares o sinusoidales, que ofrecen una frecuencia de 2.500 hercios modulada por una onda que puede variar de 50 a 80 hercios. Objetivo: Observar la efectividad del uso de la radiofrecuencia frente a la corriente rusa en la mejora de la flacidez abdominal. Metodología: Se trata de un estudio bibliográfico con finalidad comparativa entre las técnicas descritas en los artículos seleccionados. Resultados: Los artículos fueron seleccionados en base a las palabras clave, y el título en cuestión, criterios de inclusión y exclusión, la muestra se basa en analizar cuál de las técnicas estudiadas obtuvo mejores resultados. En la literatura existen varios resultados satisfactorios en relación a la electroestimulación, ya que ayuda a la capacidad de función muscular y describen los principales objetivos de la técnica. Conclusión: Se concluye que las técnicas son efectivas para la flacidez abdominal, sin embargo aún existen pocos estudios recientes sobre las técnicas estudiadas.

Palabras clave: Flacidez abdominal; Radio frecuencia; Cadena rusa.

1. Introduction

The skin is a biological element, being the largest organ of the human body with elastic visco performance and ability to change when a pressure is exerted against the tissue. Having connection between the internal resistance of the material with the load and its own elasticity. There are two phases: plastic and elastic. The elastic phase is the tension exerted directly appropriate to the ability of the tissue to respond to the load and, if the load is eliminated, the tissue immediately returns to its initial form, then limited to the elastic if it is exceeded (Lopes,2015). The plastic phase, when the tissue suffers some deformation, this deformation becomes permanent, because the fibers break, making it impossible to return to the initial phase of the tissue, causing there to be a tissue deformation (sagging).

The skin is basically formed by three correlated layers, the epidermis, dermis and hypodermis. The epidermis consists of keratinized stratified pavement epithelium, with considerable structural and functional changes depending on its anatomical site.

Inferior to the epidermis is the main skin mass, the dermis, a strong, malleable tissue with viscoelastic qualities. Composed of connective tissue that is formed by collagen protein and elastin fibers that allow structure, firmness and elasticity to the tissue (Gerson et al., 2017). Collagen is a three-dimensional helix protein formed by three amino acids, promoted by fibroblasts, whose synthesis depends on the presence of vitamin C. Elastin is a helical protein, which binds the skin to muscle tissues, she admits that the skin returns to its original state after being subjected to a forced stretch.

The highest level of elastin production occurs in adolescence and during pregnancy, allowing the belly skin to enlarge, following the uterine expansion resulting from the growth of the fetus. Collagen production has the highest apex in adolescence and begins to regress production from the age of 30, being one of the reasons for the appearance of wrinkles and sagging skin⁹

The abdominal wall is essential for body posture, pelvic stability, trunk, breathing, trunk movement and abdominal visceral support (Lima,2015)

Muscle sagging ends up happening by decreasing muscle tone, with the muscle having little resistance. It can have the feature in two distinct ways: muscle and skin sagging. The two types appear interconnected, producing an even worse aspect to the parts of the body affected by the problem. Muscles become flaccid in particular because of lack of physical exercise. If they are not recruited, the muscle fibers become hypertrophy and flaccid (Low, 2016).

Currently there are countless therapeutic approaches in order to eliminate and/or mitigate these changes, and can be performed through drugs, cosmetics, appliances, intradermotherapy, surgical catabolism, among others (Orlandi, 2005).

Radiofrequency is used in the treatment of skin sagging, being one of the biggest problems caused by aging, which affects the dermis, modeling collagen fibers and smoothing wrinkles of the face, this artifice causes the reconditioning of the skin improving the elasticity and tensor capacity of collagen-miscegenated tissues, producing new quality fibers determining an improvement of sagging, both facial and body. The physiological effects of radiofrequency in the treatment of sagging include vasodilation, increased blood circulation, in addition to the temperature that rises causing a local vasodilation, there is also a stimulus of the transport of nutrients and oxygen, contributing to the elimination of (Martins, 2015).

The Russian current, also known as Russian stimulation, is composed of rectangular or sine current impulse trains, bipolar, symmetrical, released at the frequency of 2,500 hertz modulated by a wave that can oscillate from 50 to 80 hertz (Carvalho, 2011).

In medium frequency neuromuscular electrical stimulation (NMES) (2,500Hz) the Russian current performs stimulating motor nerves, depolarizing membranes, producing a larger and synchronized muscle contraction, causing muscle strengthening and skin sagging (Maciel, 2015)

2. Methodology

The research is characterized as a bibliographic review of the narrative type, carried out through searches of bibliographic references of relevant studies, in the online databases of Latin American and Caribbean Literature in Health Sciences (LILACS) and Scientific Electronic Library Online (SCIELO) and other sources of information such as: literary collection of the Unirg University library, Dialnet and academic Google.

Inclusion criteria were: articles with focused treatment for abdomen, with publication of up to 10 years and based on radio frequency and/or Russian current techniques.

On the other, the exclusion criteria adopted were those that did not fit those of inclusion. The keywords used were: abdominal sagging, muscle sagging; Russian current; Radio frequency; abdomen.

The data collection period was from August to October 2022. After the selection of the material and reading, it was analyzed and discussed, aiming to offer a greater notion about the comparison between Russian current and radiofrequency in abdominal sagging its respective relevance.

Because it is not a study with human beings, the present study did not need to be submitted to the ethics and research committee, according to resolution 466/12.

3. Results and Discussion

Articles were selected based on the keywords, and on the title in question, being framed according to the inclusion and exclusion criteria, the sample is based on analyzing which of the techniques studied obtained the best results. The crossing of keywords and the use of filters made it possible to obtain a total of 19 references, four were discarded because they did not fit the inclusion criteria. Thus, the sample of this study had 15 references, according to the inclusion criteria and keywords researched.

It is reported that Radio frequency is conceptualized in the eminence of high frequency electric currents, producing an electromagnetic field that produces heating, as soon as it comes into contact with human body tissues. The therapy programs and modulates the frequencies projected to the body tissue, with the intention of reaching the subdermal layer. Consists of a safe therapy applicable to all photo skin types (Kamel, 2016).

The thermal action of radiofrequency stimulates the limited denaturation of the old collagen fibers that provides the sum of new collagen molecules by the incited fibroblasts, this process is called neocollagenase, thus managing to soften the sagging of the skin, giving more firmness and elasticity.

On the other, the Russian current is an electrical stimulus used to generate a muscle contraction at the place where it is applied. Therefore, it is able to perform an improvement in muscle tone and skin flaccidity, in addition to stimulating blood circulation, lymphatic and cellular oxygenation. To promote greater body muscle tonicity, improved cellulite appearance and aesthetically body modeling it can be used.

Thus, the search for faster improvement and more effective results drives the search for intervention alternatives that contribute to therapy in shorter periods and with noninvasive techniques that ensure the health of muscle tone and at the same time provides female well-being in relation to its aesthetics (Borges, 2016).

In the literature there are several satisfactory results in relation to electrostimulation, where the improvement of muscle function capacity occurs, describing the main objectives of the technique that are: to preserve the quality and quantity of muscle tissue, to raise or maintain muscle strength and stimulate blood flow in muscle (Borges, 2016). For better muscle recruitment, electrostimulation12eve develop strain to the muscle, so that there is effective muscle strengthening (Briel, 2015)

The success of this therapy will largely depend on the parameters in use in electrostimulation. To use neuromuscular electrostimulation more effectively, the therapist needs to know not only the condition to be treated, but also the whole mechanism that occurs in the tissues by the use of electric current, making the proper use of all stimulation parameters and knowing when and how to regulate them making them more satisfactory to the patient's reality (Pereira, 2015).

The objective of this therapeutic modality is to provide, due to muscle contraction, muscle strengthening or hypertrophy, as well as increased blood and lymphatic circulation, thus improving tissue trophism (Hantash, 2009)

Some studies indicate that the muscle fiber responsible for sagging is not known for sure, aiming that the lack of physical exercise can lead the individual to deconditioning in both type II and type I red fibers, so it is difficult to point out which muscle fiber is responsible for sagging. In this sense there is a need to work both, finally, another inconclusive aspect is to verify exactly the amount of sessions necessary to achieve muscle toning through the Russian Current (Guiro & Guiro, 2004)

The procedure using Radiofrequency generates changes in collagen fibers, which positively reflects on the quality of the skin, these changes are visible in the skin through the reduction of wrinkles and sagging which is not verified in only four sessions of Radiofrequency (Agne, 2011).

In rats recommends a treatment of at least seven days and that the permanence of radiofrequency effects on collagen tissue is up to 15 days, however moderate temperatures from 37° to 39° increases the condition of the tissues, suggestive of collagen neoformation and manifestation of large amount of subepithelial vessels (Carvalho,2011)

The influential treatment found in RF studies says that it is eight to twelve sessions necessary, with an interval of twice a week, and the mechanism of recovery of skin appearance occurs due to collagen contraction and neocollagenogenesis and possibly due to lipolysis (Ayres,2018)

RF is also shown to be safe when associated with other rejuvenation methods, such as dermal implants. A study conducted with RF application, two weeks after implantation of hyaluronic acid or calcium hydroxyapatite, in the same area, demonstrated that there were no morphological changes in the implanted material or in the surrounding skin (Ishida, 2018)

The heating caused by radio frequency is safe and effective in the treatment of Fibro Edema Geloid and in the reduction of the diameter, also exposing that all types of radio frequency improve the appearance and reduce the circumference of the treated area (Oliveira, 2015)

The sensory response is different in each person, so during the application of RF, the temperature should be supervised through a thermometer until it reaches the ideal temperature. The procedure is terminated with hyperemia and intense thermal sensation, which is soon relieved, and may return to normal activities.

Radio frequency requires constant monitoring of temperature, repetitive movements and physical wear of the professional. However, it allows better tracing of the body silhouette (Lee, 2019)

4. Conclusion

According to the results obtained in the evidenced knowledge, it can be concluded that the comparative study between Russian current and radiofrequency in abdominal sagging is a subject of great relevance.

Based on the results achieved in the studies shown, it can be concluded that from this research both techniques are effective for abdominal sagging, especially when associated are used, and the use of radio frequency documented and published results indicate a high safety margin, with satisfactory efficacy. The radiofrequency technique seems to be more established and clinically proven. The retraction of collagen and the activation of fibroblasts caused by diathermy will improve the firmness and elasticity of the skin by reshaping the tissue. On the other hand, the use of the Russian current shows satisfactory results in the treatment of muscle sagging, improvement of the tone.

The results show that the techniques are safe, effective and well tolerated in the issue of pain, being noninvasive body procedures.

Further research is indispensable to contribute to the growth of knowledge about the subject addressed, thus aiming at increasing the research to be carried out by increasing the proof of the effectiveness of the techniques.

Referências

- Agne, J. E. (2011) *Eu sei eletroterapia*. Santa Maria 2ª Edição. Gráfica Palloti.
- Ayres, Nathalie. (2018) *Corrente russa: tratamento usa corrente elétrica com fins estéticos e terapêuticos: A técnica desenvolvida na Rússia ajuda no combate a flacidez, celulite e rugas*.
- Borges, Fábio S & Scorza, Flávia A. (2016) *Terapêutica em estética, conceitos e técnicas*. Ed. São Paulo, (337-339; 414-41)
- Briel af, Pinheiro mf & Lopes LG. (2015) *Influência da corrente russa no ganho de força e trofismo muscular dos flexores no antebraço não dominante*. Arq Cienc Saúde Unipar; v.7 e 3 (205-210)
- Carvalho, G. F. & Silva, R. M. V. (2011) *Evaluation of the radiofrequency effects on connective tissue*. Especial Dermatologia, v. 68(10-25).
- Carvalho, G. F. & Silva, R. M. V.; (2018) *Evaluation of the radiofrequency effects on connective tissue*. Especial Dermatologia, v.68(10-25).
- Galembeck, F. & Csordas, Y. (2019) *Cosméticos: a química da beleza*.
- Gerson, J. Et al.(2017) *Fundamentos de estética 3: ciências da pele*. São Paulo Cengage Learning Edições Ltda. São Paulo, v.3(10.ed..)
- Guirro, e.; Guirro, R.(2004) *Fisioterapia Dermato-Funcional*. (3. Ed.) Barueri: Manole.
- Hantash, B. M.; Ubeid, A.A.; Chang, H.; Kafi, R & Renton, B. (2009) *Bipolar fractional radiofrequency treatment induces ne elastogenesis and neocollagenesis*. Lasers in Surgery and Medicine, v.41(1-9).
- Ishida, M.; El-Ammawi, T.S. & Medhat, W.(2018) *Radiofrequency facial rejuvenation: Evidence-bases effect*. American Academy of Dermatology, 64(3), p. 525-535.
- Kamel, D & Yousif, A. (2017) *Neuromuscular Electrical Stimulation and Strength Recovery of Postnatal Diastasis Recti Abdominis Muscles*. Annals Rehabilitation Medicine, Manama, v.41(3) 465-474, Jan..
- Lee, D.G.; Lee, L J. & Mclaughlin, L. (2019) *Stability, continence and breathing: The role of fascia following pregnancy and delivery*. Journal of bodywork

and movement therapy, New York, v.12(4), p. 333-348.

Lima, E. P. F. & Rodrigues, G. B. O. (2015) A estimulação russa no fortalecimento da musculatura abdominal. ABCD, arq. Bras. Cir. Dig. V.25(2) .

Lopes Sc, Brongholi K. (2015) A utilização da corrente russa no tratamento da flacidez muscular abdominal.

Low J, Reed (2016) A. Eletroterapia explicada: princípios e práticas. (3.ed.), Manole.

Maciel D & Oliveira GG (2015). Prevenção do envelhecimento cutâneo e atenuação de linhas de expressão pelo aumento da síntese de colágeno." Multiprofissional em Saúde: Atenção ao Idoso.

Martins, A. B.; Ribeiro, J. & Soler, Z, A. S. G.(2015) Proposta de exercícios físicos no pós-parto. Um enfoque na atuação do enfermeiro obstetra. Invest. Educ. Enferm.; v. 29(1).

Meyerpf, Medeiros Jo & Oliveira Sg.(2003) O papel psicossocial do ambulatório de fisioterapia dermatofuncional na saúde e da população de baixa renda. Fisioterapia em Movimento; v.16(4):55-61.

Oliveira, B; Jacinta, E & Martins, T.(2015) Comparação Entre A Corrente Russa E A Fes No Fortalecimento De Mulheres Sedentárias. 61 F. Monografia - Curso De Fisioterapia, Centro Universitário Católico Salesiano Auxilium.

Orlandi, V. (2005) Corrente Russa E Exercício Resistido No Músculo Glúteo Máximo. Tubarão: Universidade Do Sul De Santa Catarina. Monografia De Graduação Em Fisioterapia

Pereira, P. C.; Et Al (2015). Edermoterapia E Ultrassom Terapêutico Associado A Massagem Modeladora Na Redução De Medidas Abdominais. 2015. 10 F. Tese (Doutorado) – Curso De Fisioterapia, Centro Universitario De Itajabú, Itajabú. Disponível Em: File:///C:/Users/Dora/Downloads/10-78-2-Pb.Pdf. Acesso Em: 11set 2020.