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Dermatofunctional physiotherapy: radiofrequency and the effects on the rejuvenation of face expression treatment

Fisioterapia dermatofuncional: radiofrequência e os efeitos no tratamento do rejuvenescimento da expressão da face

Fisioterapia dermatofuncional: radiofrecuencia y efectos sobre el rejuvenecimiento del tratamiento de expresión facial

RESUMO

Objetivo: Identificar, através de um levantamento bibliográfico, os efeitos da radiofrequência no rejuvenescimento facial. Métodos: Estudo de revisão integrativa, realizado no período de setembro a outubro de 2020. Pesquisados nos bancos de dados: LILACS, SciELO, Periódicos CAPES e PubMed. Os descritores utilizados e relacionados, com o operador booleano "and", em português e inglês foram: radiofrequência, expressão da face, pele Rejuvenescimento; Fisioterapia e Radio frequency; Face expression; Skin; Rejuvenation; Physiotherapy. Foram realizadas buscas publicações dos últimos 10 anos. Resultados: Após a leitura minuciosa dos artigos elegíveis, foram selecionados três artigos. Os autores relatam que os efeitos da radiofrequência são significativos na redução da extensão e profundidade das rugas e na melhora da aparência da flacidez pele, além de melhora perceptível da expressão da face. Conclusões: Os efeitos da radiofrequência delinear-se de maneira bastante evidente, principalmente no que diz respeito a melhora do tônus da pele e da diminuição das rugas.

DESCRIPTORES: : Radiofrequência; Expressão da face; Pele; Rejuvenescimento; Fisioterapia

ABSTRACT

Objective: To identify, through a literature review, the effects of radiofrequency on facial rejuvenation. Methods: Integrative review study, carried out from September to October 2020. Searched in the databases: LILACS, SciELO, CAPES Periodicals and PubMed. The descriptors used and related, with the Boolean operator "and", in Portuguese and English were: radiofrequency, facial expression, skin Rejuvenation; Physiotherapy and Radio frequency; Face expression; Skin; Rejuvenation; Physiotherapy. Searches for publications from the last 10 years were carried out. Results: After a thorough reading of the eligible articles, three articles were selected. The authors report that the effects of radiofrequency are significant in reducing the extension and depth of wrinkles and improving the appearance of sagging skin, in addition to a noticeable improvement in facial expression. Conclusions: The effects of radiofrequency were clearly outlined, especially with regard to improving skin tone and reducing wrinkles.

DESCRIPTORS: Radio frequency; Face expression; Skin; Rejuvenation; Physiotherapy

RESUMEN

Objetivo: Identificar, a través de una revisión de la literatura, los efectos de la radiofrecuencia en el rejuvenecimiento facial. Métodos: Estudio de revisión integrativa, realizado de septiembre a octubre de 2020. Búsqueda en las bases de datos: LILACS, SciELO, CAPES Periodicals y PubMed. Los descriptores utilizados y relacionados, con el operador booleano "y", en portugués e inglés fueron: radiofrecuencia, expresión facial, rejuvenecimiento de la piel; Fisioterapia y Radiofrecuencia; Expresión facial; Piel; Rejuvenecimiento; Fisioterapia. Se realizaron búsquedas de publicaciones de los últimos 10 años. Resultados: Después de una lectura exhaustiva de los artículos elegibles, se seleccionaron tres artículos. Los autores informan que los efectos de la radiofrecuencia son importantes para reducir la extensión y profundidad de las arrugas y mejorar la apariencia de la piel flácida, además de una mejora notable en la expresión facial. Conclusiones: Los efectos de la radiofrecuencia fueron claramente delineados, especialmente en lo que respecta a mejorar el tono de la piel y reducir las arrugas.

DESCRIPTORES: Radiofrecuencia; Expresión facial; Piel; Rejuvenecimiento; Fisioterapia

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INTRODUCTION

The world market for Beauty and Aesthetics is constantly growing and has been arousing interest in the scientific area, due to new technologies for various aesthetic dysfunctions. Vanity and self-esteem have stood out due to the standards of beauty imposed by society and the media. Therefore, the search for techniques that attenuate and revitalize the expression marks acquired over time has increased. Thus, characterizing the need and importance of the emergence of the specialization area of dermatofunctional physical therapy, aiming at the use of aesthetic treatment resources and techniques to promote prevention or treat aging signs such as flaccidity and expression lines. 1

Aging is a complex process that affects all organs and tissues, and its effects are most visibly observed on the skin and underlying structures, causing aesthetic and functional changes. Over the years, the skin undergoes degenerative changes, losing the mechanical integrity of the dermis. Thus, in biological terms, skin aging is characterized by the flattening of the dermoepidermal junction and the general atrophy of the extracellular matrix with a reduction and disorganization of collagen and elastin. 2

The appearance of expression lines and flaccidity are signs that do not necessarily

indicate the individual's biological age, since skin aging depends on intrinsic and extrinsic factors. 3 Intrinsic factors are those related to age and genetics, causing the organism's natural wear and tear that is expected and inevitable. Extrinsic factors, on the other hand, are related to the cold, sun exposure, poor diet, smoking and stress, favoring the appearance of more evident signs of aging. 4

The advancement of technology based on scientific research shows increasingly innovative facial rejuvenation procedures that help in facial revitalization, helping the skin aging process with various electrotherapeutic resources and active ingredients for facial rejuvenation. Among the resources, Radio Frequency (RF) is a device that stands out for producing electromagnetic energy that is transformed into heat, increasing the temperature in tissues, producing an inflammatory reaction in them that is capable of promoting increased fibroblast activity, causing neocollagenesis, neoelastogenesis and tissue remodeling. 5

Radiofrequency is a high-frequency current that reaches the skin, generating controlled heat, in a non-ablative form. It promotes heat by conversion between 30 KHz and 300 MHz, the frequency being most used between 0,5 to 2,5 MHz and maintaining the temperature around 40°C during the application period. 6

The heat supplied in this process reaches the innermost layers of the skin tissue, causing fibers to contract and others to form. There is an increase in blood circulation and reduction of toxins, which causes an improvement in oxygenation and increased metabolism, which generates an instant tension and toning of the skin. 7

The physiological effects of Radiofrequency are: vasodilation, which occurs through increased blood circulation, also causing the movement of nutrients and oxygen; metabolic and enzymatic activity, caused by the increase in temperature; viscosity, for the same reason as above; change in collagenous tissue; and nerve stimulation, which causes an analgesic effect. In this process, the level of skin hydration is important, because the higher it is, the faster it retains heat, there will be a contraction of collagen, which will have its synthesis increased, a new collagen will be formed, and this dynamic will be progressive to Radiofrequency sessions. 8

Thus, the objective of this research is to identify, through a literature review, the effects of radiofrequency on facial rejuvenation.

METHODS

An integrative bibliographical review study was carried out, with an exploratory

nature, observing the presupposition of the analysis of the survey of scientific findings. The integrative review is a research method that aims to synthesize the findings found in research databases, contextualizing a particular theme or issue. This process takes place in an orderly and comprehensive way. However, the reviewer/researcher can design an integrative review with different approaches, constituting the feasibility of definition, concepts, theory review or methodological analysis of eligible studies on a specific topic.⁹

The characterization of the search for articles in the databases was carried out between September and October 2020 and consisted of the following research sources: Latin American and Caribbean Literature in Health Sciences (LILACS), The Scientific Electronic Library Online (SciELO), Coordination for the Improvement of Higher Education Personnel (CAPES) and PubMed. To carry out the search for articles, the Boolean operator “and” was used, interspersed with the following descriptors, in Portuguese: Radiofrequência; Expressão da face; Pele; Rejuvenescimento; Fisioterapia and for English language: Radio frequency; Face expression; Skin; Rejuvenation; Physiotherapy.

Inclusion criteria and eligibility for selection of articles were: publications in Portuguese and English; articles in full and free, articles published and indexed in these databases of the last 10 years due to the lack of specificity of the study. Articles that were not related to the theme of the integrative review and duplicates were excluded.

The hierarchical classification of evidence for the evaluation of the articles in this research was based on the categorization of the Agency for Healthcare Research and Quality (AHRQ). The quality of evidence is classified into six levels: level 1, (meta-analysis); level 2 (experimental study); level 3 (quasi-experimental study); level 4 (non-experimental study); level 5 (case study report); level 6 (opinion of reputable authorities based on clinical competence).¹⁰

The preparation of the integrative review followed the following guided steps, 9 they are: identification of the theme in the

research databases through the list of descriptors, eligibility of inclusion/exclusion criteria and duplicate articles, conceptualization of information obtained by reading titles and abstracts, analysis of selected studies with full reading, interpretation of data and presentation of the synthesis of the acquired knowledge.

RESULTS

The descriptors were crossed, which found: 19 articles in LILACS, in which only 2 articles were included; 3 articles in Scielo, but none were included; 12 articles on the CAPES Portal, with only 1 article inserted; and 09 articles were found on the PubMed platform, however none were included. Thus, the sample consisted of 3 articles, as shown in Figure 1.

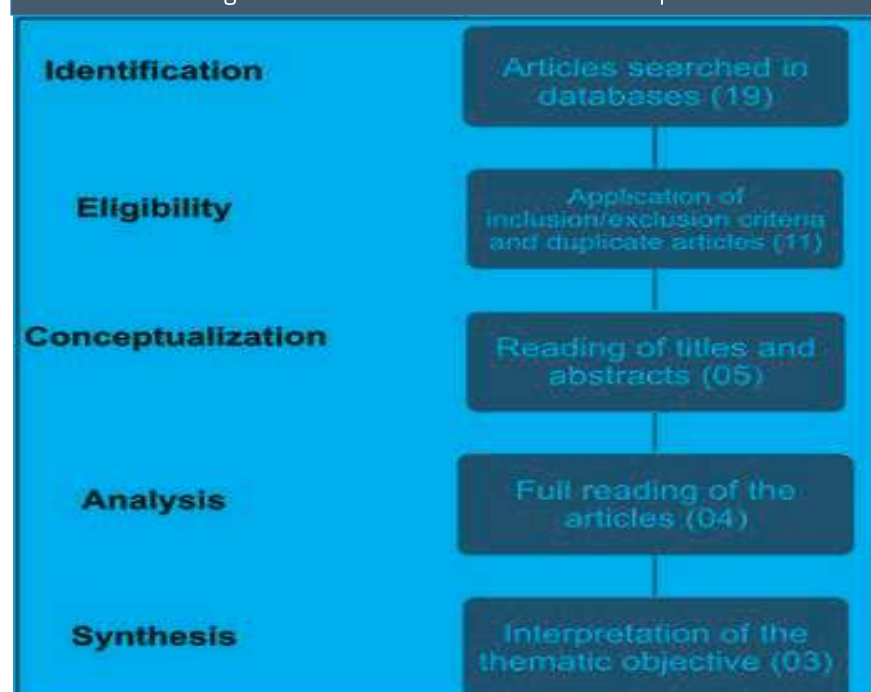
Table 1 shows the level of methodological qualification of the articles according to the Agency for Healthcare Research and Quality (AHRQ) categorization. It is clear that the classification of articles establishes the same level 2 of satisfactory methodological quality, as characterized in table 1.

Table 2 characterizes the main information for data interpretation and presentation of the summary of knowledge obtained.

DISCUSSION

A study¹¹ observed that, in relation to the results of patient satisfaction with the treatments tested, the aspects investigated were flaccidity, wrinkles, texture and tone of the treated skin. For flaccidity, 57,9% of patients undergoing treatment with a tip in group B reported being very satisfied, while this percentage in the standard group was 55,3% of patients were satisfied with the results provided by the treatment in the standard and 36,8% in group B. In general, both treatments showed expressive results with regard to flaccidity, since the aggregate percentages (very satisfied and satisfied) were 94,8% and 94,7% for group A and group B, respectively. Regarding wrinkles, more than half of the patients are satisfied with both treatments analyzed, whose percentages were 73,7% for the standard group and 50% for group B. Assessing the aggregate

Figure 1 – Flowchart of article selection steps.



Elaborated by the author (2021)

gated level of satisfaction, the percentages of very satisfied and satisfied were 94,8% (group A) and 89,5% (group B). 11

Therefore, it is observed that in relation to the standard group that used the conventional radiofrequency device, which does justice to our research, the results were clearly outlined, especially with regard to the improvement in skin tone and reduction of wrinkles.

It is noticed that the smoking and non-smoking groups have similar characteristics in relation to the size of the wrinkle present in the outer corner of the eye, and, therefore, no significant differences were found between the groups ($F_{1,22} = 2,36; p = 0,13$), which demonstrates the homogeneity between the study groups. All study participants showed a reduction in the extension of wrinkles measured by the caliper on the right face. Two-way ANOVA revealed significant changes after 10 treatment sessions ($F_{3,22} = 3,39; p < 0,05$).

Duncan's post-hoc analysis showed that there was a significant difference when comparing the 1st and 10th sessions of the non-smoking volunteers ($p < 0,05$). The same statistical difference was found when comparing the 1st session of the smoking group with the 10th session of the non-s-

Table 1 - Hierarchical classification of evidence from the articles.

ARTIGO	METHOD	QUALITY OF EVIDENCE
DE LIMA GADELHA, Raissa de Lima et al. RPulsed radiofrequency for periorbital flaccidity: comparative study. v. 10, n. 2, p.140-146, 2018.	Randomized clinical study	Level 2
Effectiveness of radiofrequency in the facial treatment of smoker and non-smoker volunteers, v. 20, n. 2, 2016.	Clinical study	Level 2
Fractioned ablative radiofrequency: a pilot study with 20 cases for lower eyelid rejuvenation., v. 6, n. 1, pág. 50-55, 2014.	Clinical study	Level 2

Elaborated by the author (2021)

Tabela 2 - Delineamento, métodos e principais desfechos dos estudos selecionados

AUTHOR/ YEAR	OBJECTIVE	SAMPLE	METHOD	MAIN FINDINGS
GADELHA RL, et al (2018)	To compare the results and side effects after using two types of electrodes coupled to a radiofrequency device for the rejuvenation of the eyelid region.	The final sample consisted of 76 patients, 38 from the standard group and 38 from the Lima group 8. The groups had similar mean ages: 47,21 years	Clinical study, randomized by lot, blind, comparative and without placebo	Expressive results with regard to flaccidity, the aggregate percentages (very satisfied and satisfied) were 94,8% and 94,7% for the standard group and Lima 8. In relation to wrinkles, the aggregated level of satisfaction, the percentages of very satisfied and satisfied patients were 94,8% (standard) and 89,5% (Lima 8)

MARCHI JP, et al (2016)	To evaluate the effects of radiofrequency facial treatment on the skin of smoking and non-smoking volunteers.	08 female volunteers, 04 smokers and 04 non-smokers, aged between 47 and 53 years old	Comparative clinical study	Study participants showed a reduction in the extension of wrinkles measured by the caliper on the right face. ANOVA of two pathways revealed significant changes after 10 sessions of treatment ($F_{3,22} = 3,39$; $p < 0,05$)
CASABONA G, et al (2014)	Describe operating principles, methodology and results of rejuvenation in lower eyelids treated with fractional ablative radiofrequency and consequent thermal damage observed in histopathology	Twenty patients were randomly selected. Age between 40 and 65 years old, female	Prospective clinical study	Of the 20 patients, 18 were very satisfied (90%) and only two (10%) were just satisfied with the results of improved skin texture and flaccidity.

Elaborated by the author (2021)

moking group. The authors of this study comment that the effects of radiofrequency are significant in reducing the extension and depth of wrinkles and improving the appearance of sagging skin, in addition to a noticeable improvement in facial appearance, that is, it is a complete treatment for skin revitalization. 12

In another finding, 12 of the 20 patients, 18 were very satisfied (90%) and only two (10%) were just satisfied with the results. Two (10%) had post-inflammatory hyperpigmentation of the treated region, which resolved after using the topical hydroquinone/tretinoin combination for 15 days. The authors emphasize that radiofrequency is another possibility for the treatment of skin aging. Because it is characterized by its procedure that emits waves that reach the deepest layers of the skin, generating energy and strong heat over them, while keeping the surface cool and protected. It is necessary to emphasize that the research-

ers report that the findings of this study demonstrated that this technique can be evidenced as an effective treatment for the rejuvenation of the periorbital region. Thus, it is observed that currently, there are several ongoing studies trying to demonstrate these effects not only on the eyelids, but on the entire face, in acne scars, unsightly scars and stretch marks. 13

CONCLUSION

After reviewing the findings and analyzing the consensus in the literature, with regard to the effects of radiofrequency for the aesthetic treatment of the skin, specifically in the face region. We can see that this is a therapeutic method widely used in physiotherapy, in the dermatofunctional specialty. Which demonstrated that the proposed objectives were achieved, which were characterized by effective and safe effects in reducing wrinkles and sagging skin in the

face region.

It is observed that the objective achieved in this review may be relevant and applicable to the community, since it consists of a safe therapeutic approach, of easy economic access and that does not promote side effects on the skin, as it does not have invasive applicability.

However, there are few studies available in full, mainly free in nature on this subject. Therefore, to this end, access to clinical trials studies with good methodological quality and free of charge is difficult. The importance of conducting new randomized clinical trials with open access for the academic community and society is recommended. Based, in this way, the easy access of scientific updates on the scientific effectiveness of radiofrequency in the treatment of wrinkles and sagging skin.

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