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Treatment of stretch marks on female breasts

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SUMMARY

Stretch marks are common marks on the skin, caused by the rupture of collagen and elastin fibers, and can cause aesthetic discomfort. This work is focused on comparing two equipments, Electrolifting and Microneedling, our objective is to demonstrate which of the
equipment will be more favorable for the treatment of stretch marks on the breast. This is a bibliographic review carried out with the databases Pubmed, Scielo, Google Scholar, Science.gov, Capes and in the physical and virtual library of Senac Santo Amaro, from February to November 2024. For the selection of articles, the following inclusion criteria were established: scientific articles from the last 10 years, clinical studies, volunteers with striae alba and/or rubra in the breast region, treatments performed using electrolifting or microneedling (motorized, robotic or roller) with needles from 0.20 mm to 3 mm.

Keywords: Stretch marks; Aesthetic treatments; Breast.

ABSTRACT

Stretch marks are common marks on the skin, caused by the rupture of collagen and elastin fibers, and can cause aesthetic discomfort. This work is focused on the comparison of two equipment, Electrolifting and Microneedling, our objective is to demonstrate which of the equipment will be more favorable for the treatment of stretch marks on the breast. This is a bibliographic review carried out with the Pubmed, Scielo, Google Scholar, Science.gov, Capes databases and in the physical and virtual library of Senac Santo Amaro, from February to November 2024. For the selection of articles, the following inclusion criteria were established: scientific articles from the last 10 years, clinical studies, volunteers with striae alba and/or rubra in the breast region, treatments performed using electrolifting or microneedling (motorized, robotic or roller) with needles from 0.20mm to 3mm.

Keywords: Stretch Marks; Aesthetic Treatments; Breast

1. INTRODUCTION

The skin is the largest organ in the human body and has a very complex structure, composed by different types of tissues and cells, in addition to performing several essential functions. It acts as a communication link between the organism and the external environment, being fundamental for the maintenance of life. Among its main functions, the regulation of temperature stands out body, immunological protection, perception of sensory stimuli, acting as a barrier physical against external aggressions, in addition to preventing the loss of water and proteins to the environment external. The integumentary system is composed of layers ranging from the epidermis, the outermost layer superficial; to the deepest layer, the dermis. The epidermis and dermis are layers of the skin that overlap. The skin is considered the largest organ of the human body, having several functions such as protection, nutrition, perspiration and absorption. (PINHEIROS & SOUZA, 2021). Several changes can affect the skin, either physically or physiologically; causing thus dysfunctions in the tissue, as is the case with stretch marks (MOREIRA & GIUSTI, 2013).

Stretch marks are commonly skin changes, which occur specifically in the dermis, causing dissatisfaction for many individuals, causing psychological suffering because it is related with appearance (SILVA ET AL. 2020). An outbreak of them occurs through changes hormonal, physical and genetic conditions (TIAN ET AL. 2019).

This causes an exacerbated stretching of the skin, which is organized in a way straight and when this damaging process occurs, the stretch marks will appear with a hue reddish or pinkish, generating Striae Rubra (SR), which may be raised and Later, they will evolve into discoloration, atrophy and permanence, generating stretch marks. Albas (EA), which as the name suggests, are faded in color (LU, ET AL. 2020) . Although when they are ER it is because an inflammatory process is present and when they become EA, the process stops being inflammatory and moves to the final phase where the healing process is completed (FERNANDES, 2019).

Located in the dermis, stretch marks cause an unsightly appearance on the skin and are a reason frequent complaints from people affected by this dysfunction. They do not compromise the functionality of the individual, but stretch marks interfere with social and emotional aspects. The areas most affected by stretch marks are the arms, breasts, buttocks, and the inner part of the thighs, flanks and hips (CARVALHO, 2019).

In this sense, due to the increased demand for aesthetic procedures, several therapeutic modalities have been described for the treatment of stretch marks, such as microneedling and electrolifting, although there is no totally effective modality (GUNGOR et al., 2014).

Society's pressure to value the perfect body causes stretch marks to appear. discomfort with appearance and negatively affect self-esteem, especially among women. Nowadays, the field of aesthetics goes beyond concern for appearance, it involves also emotional well-being, which explains the significant growth in demand for aesthetic treatments.

Thus, the objective of the present study is to compare the effects of the procedures electrolifting and microneedling, in the treatment of stretch marks on the breasts.

2. THEORETICAL FRAMEWORK

2.1 BREAST ANATOMY AND PHYSIOLOGY

Female breasts are composed of structures such as lymph nodes, areola, nipple, ducts and mammary lobes, surrounded by fibrous and adipose tissue. They are located between the 2nd and 6th ribs, over the pectoralis major muscle. Its vascularization comes from the thoracic and intercostal arteries, and the shape depends on the amount of adipose tissue and genetic factors. They also have apocrine sweat glands in the areola. The breast varies throughout life and is formed by adipose, connective, glandular tissue, vessels and nerves (NETTER, 2006).

2.2 EPITHELIAL TISSUE

Epithelial tissue covers the breast and forms the mammary glands. It is divided into epithelium of covering (protection) and glandular (secretion). The mammary glands produce proteins, lipids and carbohydrates, stored in vesicles called secretory granules.
Simple and stratified epithelia can be subdivided into pavement (flat), cubic and prismatic, according to the shape of their cells (DA COSTA, 2016; LOPES, 2017; COSTA, 2016).

2.3 SUPPORT FABRIC

The supporting tissue covers all the epithelia, filling all the spaces located there.
between the organs. They are composed of cells unified by interstitial substance with
functions of: support; filling and connection; defense; nutrition and storage.

2.4 CONNECTIVE TISSUE

Connective tissue contains fibroblasts, macrophages, lymphocytes, plasma cells,
mast cells, adipocytes and leukocytes, separated by abundant extracellular material.
breast connective tissue is classified as dense connective tissue, with the presence of
fibroblasts responsible for the synthesis of collagen and elastin. The stroma is a tissue that
corresponds to the support and fixation of the gland. The breast extends to each lobe, which is made
by dense connective tissue, rich in collagen fibers (DA COSTA, 2016; LOPES, 2017;
COSTA, 2016).

2.5 ADIPOSE TISSUE

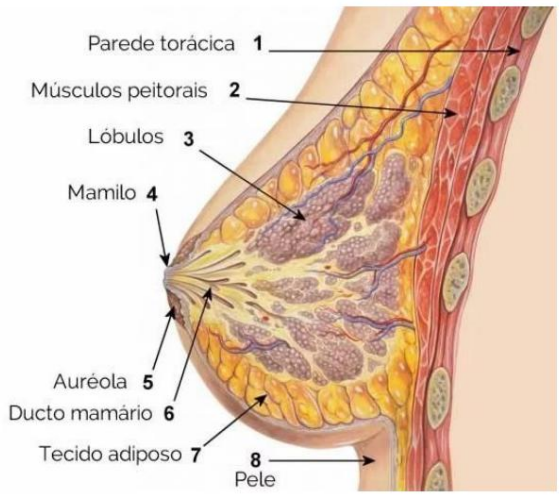
In addition to adipocytes, adipose tissue has a matrix of connective tissue (collagen fibers and
reticular cells), preadipocytes and fibroblasts, vascular smooth muscle cells, endothelial cells,
monocytes, macrophages and lymphocytes which are immune cells. Adipose tissue has the
thermal insulation function, protection of organs against mechanical shocks and energy reserve.
In the breasts, adipose tissue is formed substantially by adipose cells, and can be
divided into two parts: a superficial anterior part, which is positioned between the lobes
mammary glands taking up the spaces that separate them, reaching the depth. And a posterior part
deep, located in the retromammary space between the base of the gland and the aponeurosis of the muscle
pectoralis major (AHIMA, 2000).

2.6 MUSCLE TISSUE

Muscle tissue is of mesodermal origin and is identified by its ability to contract
and distension of its cells, which defines the activity of the elements and viscera. There are three types
of muscle tissue: smooth, skeletal striated and cardiac striated. Smooth muscle is involuntary and
It is located in the skin, internal organs, reproductive system, large blood vessels and digestive system.
excretory. The impulse for contraction of smooth muscles is permeated by the nervous system

vegetative. Skeletal striated muscle is innervated by the CNS (Central Nervous System) and, because it adheres partly under conscious control, it is called voluntary muscle.

Figure 1. Structure of the female breast



Source: FERREIRA (2023)

2.5. STRETCH MARKS

Stretch marks are linear atrophic lesions on the skin, caused by the rupture of collagen fibers and elastin. They have a red (recent) or white (old) color, depending on the vascularization and local melanocytic activity. They are common in regions such as the buttocks, hips, breasts, abdomen and lumbar.

Microscopically, striated skin shows thin epidermis, few fibroblasts and vessels, and poorly defined dermis (WHITE, 2008). Its origin is multifactorial, with three main theories: mechanical (skin stretching), endocrine (hormonal changes) and infectious (diseases that damage elastic fibers).

Prevention includes hydration, a balanced diet and avoiding the misuse of medications. (LOPES, 2017; SILVA, 2018). Although previously considered irreversible, modern treatments how microneedling and electrolifting promote aesthetic improvement through skin regeneration tissue and stimulation of collagen production (SILVIA, 2009; MOREIRA, 2013).

The impact of stretch marks goes beyond the physical, affecting self-esteem and psychological well-being, especially in women. Therefore, the search for effective treatments should be encouraged.

2.6. RED STRETCH MARKS

Stria rubra is described as initial, and presents lymphocytes, monocytes and neutrophils around the blood vessels, an increase in mesenchymal cells and active fibroblasts, which evidence an inflammatory phase.

> "Stretch marks are nothing more than a type of symptom presented by skin in a state of atrophy, which can be caused by reduced activity of fibroblasts in the production of good quality extracellular matrix and in rupture of existing fibers. Another important reason why fibers arise is related to skin dehydration, as the most sensitive skin types Dry skin is more prone to the appearance of stretch marks (VANZIN and CARRAMASCHIN FR, 2011)."

These changes are called inflammatory and correspond to the activation of mast cells. and recruitment of macrophages, associated with dermal elastosis. Changes then occur repair, which are structural modifications of the collagen bundles and activation of the fibroblasts, at this stage the lesions become clinically visible (WANG et al., 2017).

In this way, it is possible to clearly observe excessive capillary circulation in the dermis. subpapillary. In addition, there are atrophic lesions, which present a scarring appearance, with a flaccid line in the center and hypochromic coloration. The elastic fibers are intertwined, and some of them are broken. The collagen structure is disorganized, while the skin attachments remain preserved.

Because they still have blood circulation, there is a better response to treatment during this period. (BORGES, 2010; GUIRRO, GUIRRO, 2002; MONDO, 2004; OLIVEIRA, PEREIRA, 2017).

2.7 STRIAE ALBA

Over time, red stretch marks age, giving rise to white stretch marks.
pearly, presenting sequelae in the healing process, loss of melanocytes, and changes in
local circulation (BORGES, 2010; GUIRRO, GUIRRO, 2002; MONDO, 2004; OLIVEIRA,
PEREIRA, 2017).

> “They present central flaccidity and are lined by pleated epithelium in the
> which hair loss occurs, in sweat and sebaceous secretion.
> elastic fibers are mostly ruptured and the lesions evolve into
> fibrosis (KEDE, 2004).”

Unlike the red ones, they are difficult to treat due to a large loss in number.
of fibrillin and collagen, have a scar-like appearance, a flaccid line in the center and hypochromic. For
this means that the results are not so satisfactory (SOUZA, 2014).

2.8. AESTHETIC ELECTROTHERAPIES

“The term electrotherapy comes from the electrical current that can be used directly or indirectly.
indirectly, and can be transformed into other therapeutic physical agents such as
ultrasound, radiofrequency and laser which are the basis of stimulation or formation of new energy
will always be the electric current. Therefore, ELECTROTHERAPY can be defined as “the
direct or previously transformed form, in order to stimulate different organs or systems with
different objectives” (PERSEGONA, 2022)”

“The health benefits of electrotherapy include controlling pain, strengthening muscles,
prevent atrophy, reduce muscle spasms and edema and aid in healing. The
The main difference is its action at a cellular level, acting with analgesic and anti-inflammatory effects
and tissue regeneration, in which short and long-term results are achieved (BORGES, 2010).”

> “Current equipment uses different types of currents, where the device emits electromagnetic energy which is then conducted through of conductive cables to the electrodes that are attached to the skin of the patient. Other ways include using needles instead of electrodes, this use being more reserved for use in aesthetic therapy or for diagnostic methods (PEREIRA, 2007).”

2.9 ELECTROLIFTING

Created in 1952, electrolifting (or galvanopuncture) uses galvanic current and a fine needle disposable to induce microlesions that stimulate the production of collagen, elastin and neovascularization, improving the appearance of stretch marks (GUIRRO, 2004; SILVA, 2018).

The technique generates a local inflammatory process that activates cell regeneration without side effects systemic, being contraindicated in cases such as: skin infections, dry skin, loss of sensitivity and hormonal disorders (such as Cushing's syndrome). During the application, perform if the perforation of the epidermis with precise and rapid movements. The procedure can be done with three techniques: sliding, puncturing and scarification, varying the degree of invasion.

The response generated includes discreet edema, increased mitotic activity and tissue regeneration. After the session, it is essential to avoid sun exposure to prevent spots and complications. (FAGUNDO, 2014).

2.10 MICRONEEDLING

Microneedling, also called Collagen Induction Therapy (CIT), emerged in the 1990s with the name “subcision”. It aims to stimulate collagen production by through controlled micro-injuries to the skin, improving the appearance of scars, wrinkles and stretch marks.

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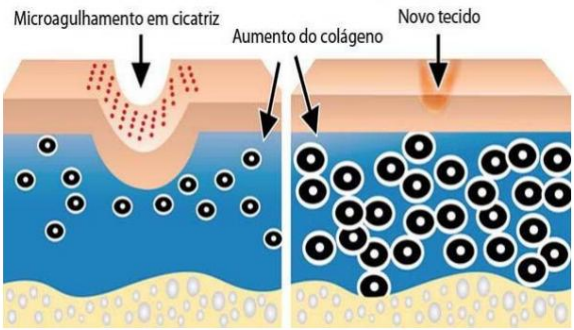
> "The injury caused by microneedling triggers through loss of tissue integrity, a new production of collagen fibers in order to repair damaged fibers, the dissociation of keratinocytes, the release of cytokines activated by the immune system, generate a vasodilation at the site of injury, causing keratinocytes migrate to the region and establish the injured tissue (Figure 2). In addition of the physiological response, micropunctures facilitate the permeation of active ingredients in the tissue (LIMA et al, 2013; DALBONE et al, 2014)."

Figure 2: Schematic representation of the increase in collagen production resulting from Microneedling in skin tissue.



Source:CRAVEIRO E SILVA (2024)

According to Oliveira (2012) and Lima et al (2013), after the injury, the most important phase of the treatment, healing, which can be divided into three phases:

1. Inflammatory (up to 3 days): release of histamine, cytokines and onset of immune defense.
2. Proliferative (4 to 14 days): epithelialization, angiogenesis and production of type I collagen.
3. Remodeling (14 days to 1 year): Type III collagen replaces type I, increasing skin firmness.

The technique uses devices such as the dermaroller (for large areas) and the dermapen (for sensitive areas). punctual), containing needles from 0.2 mm to 3 mm. The application promotes tissue regeneration and facilitates the permeation of cosmetic active ingredients.

3. MATERIAL AND METHOD

This is a bibliographic review carried out in the Pubmed, Scielo, Google databases Academic, Science.gov, Capes and the physical and virtual library of Senac Santo Amaro, in period from February to November 2024. For the selection of articles, the following were established: following inclusion criteria: scientific articles from the last 10 years, clinical studies, volunteers with striae alba and/or rubra in the breast region, treatments carried out using electrolifting or microneedling (motorized, robotic or roller) with needles from 0.20 mm to 3 mm. For better delimitation, exclusion criteria were also established, as follows: review studies, clinical studies with volunteers who had diseases or alterations decompensated endocrinological disorders or who were using medications that could influence the results, finally, studies that associate electrolifting were also excluded or microneedling with other equipment or medications.

4. RESULTS AND DISCUSSION

The present work was carried out with the aim of comparing the effectiveness of electrolifting and microneedling in the treatment of stretch marks located on female breasts, seeking to discover which treatment is most promising.

During the bibliographic survey, several studies related to the treatment of stretch marks, however, not all met the inclusion criteria established for this research. After critical reading and content analysis, forty (40) articles were excluded, because they do not fit the purpose of the work.

Among the main reasons for exclusion, studies that addressed treatment stand out of stretch marks in the postpartum period, which consider hormonal, physiological and emotional factors characteristic of this phase, and which influence the healing response and consequently the results, generating great bias in the interpretation of the data and making it difficult to compare the two techniques. Studies involving the association of

microneedling or electrolifting with other resources such as radiofrequency, LED therapy, ultrasound and laser.

In this way, the rigorous screening of the selected materials allowed the construction of a database more consistent data, ensuring greater reliability and coherence in comparative analysis between microneedling and electrolifting.

Table 1 is composed of the general characteristics of the microneedling articles: year, authors, method (needle depth, number of patients, type of equipment (roller or dermapen), number of sessions, session intervals) and main results/conclusions. These data will be important to verify the quality of treatment in order to contribute to the definition of which treatment will be most effective for stretch marks.

Table 1. Microneedling

Authors	**Method**	**Conclusion**
SILVA, SILVA, ROSA (2016)	**Type of research:** Quasi-study experimental four sessions: no controlled; **Groups:** Microneedling Group and Electrolifting Group **Number of volunteers:** 10 volunteers, atrophic striae alba in the **region:** buttocks, breasts, hips, thighs **Number of sessions:** 4 sessions; **Interval:** 1 week;	Results of planimetric analysis before and after **Manual Planimetry;** Pre 0.78 ± 0.23 Post 0.66 ± 0.20 **result: 0.001*** **Digitalized Planimetry;** 0.88 ± 0.38

	Technique used: Not informed	0.77 ± 0.31 **result:** 0.010*
ALSTER, LI, FAAD	**Type of** (2019) **search:** study experimental; **Number of volunteers:** female volunteers 04 (1 volunteer phototype 1 and 3 volunteers phototype 2) striae distensae. **Number of sessions:** 1 to 3 consecutive monthly treatments. **Interval:** monthly; **Equipment:** motorized microneedling with 36 3 mm needles, speed of 13,500 rpm; **Technique used:** horizontal, vertical and oblique steps.	Results obtained through blind evaluation carried out using photographs taken at the beginning of the study (before each treatment) and 1, 3, 6 and 12 months after treatment. **2 patients** achieved **26%-50%** improvement after **1** treatment session. **1 patient** achieved **51%-75%** improvement after **2** treatment sessions. **1 patient** achieved **76%-100%** improvement after **3** treatment sessions.

SOURCE: OWN AUTHORSHIP

Microneedling is a technique that presents positive results when used for treatments for various skin disorders, including stretch marks (COSTA, 2016).

The quasi-experimental study conducted by Silva, Silva and Rosa (2016) presented results significant improvements in atrophic striae alba after four sessions according to data from manual and digital planimetric analysis presented in Table 1. However, the authors highlight relevant methodological limitations, such as the absence of histological analysis, the lack of

randomization of the case series and the lack of detailed information on the procedures applied.

In addition, the study by Alster, Li, Faad (2019) treated 4 volunteers who had stretch marks with a period of time equal to or greater than 6 months or who had undergone previous treatments performed in the 6 months prior to the initial application of microneedling, or if the follow-up after treatment was less than 12 months. Alster, Li, Faad (2019) excluded also volunteers who had been exposed to solar radiation in the treatment areas when in start of treatment.

The application technique was standardized by the authors through a combination of passes horizontal, vertical and oblique strokes of the device were performed over the areas until uniform punctual bleeding was observed (ranging from 4 to 10 passes). It is important to highlight that a hyaluronic acid gel was applied to the stretch marks to facilitate the sliding of the device microneedling. After microneedling, gauzes soaked in ice water were used in the treated areas to remove excess hyaluronic acid gel and promote hemostasis. A thin layer of soothing balm was applied to the treated areas and finally, the volunteers were allowed to use moisturizers after 7 to 10 days and were also advised to use of gentle cleansers, soothing balm and mineral sunscreen.

The results collected in this study were obtained from photographic analysis carried out by two blinded evaluators (trained medical assistants). Stretch marks were rated on a scale of 5 points, where 0 = no change, 1 = 1%–25% improvement, 2 = 26%–50% improvement, 3 = 51%–75% improvement, 4 = 76%–100% improvement *(Global Assessment Score* (GAS) (ALSTER, LI, FAAD (2019).

Alster, Li, Faad (2019) highlight a positive response to microneedling therapy in the area of the breasts, this improvement being comparable to stretch marks in areas with thicker skin, such as buttocks/thighs. It is important to note that the results obtained at each of the points of follow-up (1, 3, 6 and 12 months), as shown in Table 1, were consistent and did not present regression or worsening, maintaining the same *Global Assessment Score.*

In parallel, table 2 presents the summary of the article by Silva, Silva and Rosa (2016) cited previously in table 1, but now with data regarding the electrolifting technique in stretch mark treatment.

Table 2. Electrolifting

Titles	Method	Conclusion
Authors: SILVA, SILVA, ROSA, 2016	**Research type:** Study of uncontrolled quasi-experimental; **Number of volunteers:** 1 volunteer with striae atrophica alba. **Number of sessions: 4** sessions; **Interval:** 1 week; **Equipment:** Not informed; **Technique used:** Not informed.	Planimetric analysis performed before and after four sessions: **Manual Planimetry;** Pre 0.73 ± 0.15 Post 0.66 ± 0.21 **result:** 0.030* **Digitalized Planimetry;** 0.88 ± 0.34 0.74 ± 0.34 **result:** 0.061* (cm2)

SOURCE: OWN AUTHORSHIP

Electrolifting is a non-invasive technique that uses electrical stimuli to promote inflammation and improved blood circulation, the latter being a factor that helps in tissue regeneration and improvement of stretch marks.

Silva, Silva and Rosa (2016) when comparing microneedling with electrolifting, observed that in addition to the improvement of atrophic striae alba through microneedling, an improvement was also obtained significant with electrolifting. Furthermore, the authors conclude through planimetric data that both techniques showed visible improvement in stretch marks after four sessions, with no significant differences between both resources (microneedling and electrolifting).

In this same study, the use of the Global Aesthetic Improvement Scale is also mentioned, whose The results were: 20% of participants considered the result "much better", 40% of participants considered the result "much better" and finally 40% of participants considered the result "better".

As with the microneedling evaluated in this study, the collection of results obtained with the electrolifting were through manual and digital planimetric analysis (table 2). When comparing the planimetry data, it is possible to observe that the data were significant only for the manual planimetry for both the microneedling group (table 1) and the electrolifting (table 2).

Entering the discussions and comparisons between the studies presented, when analyzing the studies of Silva, Silva and Rosa (2016) and Alster, Li, Faad (2019), several limitations arise that compromise a robust conclusion. First, the type of stria is not addressed in a unified. While Silva, Silva and Rosa (2016) focus specifically on striae atrophica alba, the study by Alster, Li, Faad (2019) treats striae distensae in a more generic way, without specify whether they are alba or rubra.

Secondly, only the study by Silva, Silva and Rosa (2016) compares electrolifting and microneedling, dividing treatments by sides of the body. The study by Alster, Li, Faad (2019), in turn, exclusively evaluates microneedling. For a comparative analysis effective, it would be ideal to have studies that directly compare both techniques in the same experimental design or that present adequate control groups.

The casuistry and location of the stretch marks are also limiting factors. The study by Silva, Silva and Rosa (2016) although she included 10 volunteers in the study with striae atrophica alba in multiple regions of the body, only 1 volunteer was in the breast region. Alster, Li, Faad (2019)

mention 4 volunteers with stretch marks on their breasts. The small number of patients with stretch marks specifically on the breasts and the diversity of locations in the studies make it difficult to generalization of the results for this specific area.

Regarding the methodological details of the techniques, the study by Silva, Silva and Rosa (2016) is flawed, not providing crucial information such as tip type (needle or tipless) needle), type of current, polarity of the active electrode and application technique for electrolifting and not even information about the type of microneedling, needle depth and technique application. In contrast, Alster, Li, Faad (2019) are more detailed regarding the microneedling (depth of 3 mm, motorized equipment, speed, technique of passed).

The evaluation of results also presents inconsistencies. Silva, Silva and Rosa (2016) use planimetric analysis (manual and digital) and a Global Scale of Aesthetic Improvement with percentages satisfaction. Alster, Li, Faad (2019) employ a blind evaluation of photographs by trained medical assistants using a 5-point Global Assessment Scale (GAS). Although both methodologies seek objectivity, the difference in scales and methods of evaluation makes a direct and rigorous comparison of effectiveness difficult.

Finally, the limitations and biases reported by the authors themselves weaken the conclusions. Silva, Silva and Rosa (2016) point out the absence of histological analysis, lack of randomization and lack of procedural information. Additionally, although hyaluronic acid is considered a primarily moisturizing active ingredient, in the study by Alster, Li, Faad (2019) The molecular weight of this ingredient is not informed, nor is the formulation as a whole where it is is included, therefore, this data should be considered a bias of the study.

In short, although studies provide indications of improvement for both techniques, significant methodological flaws, the lack of a direct comparison under controlled conditions and the lack of detailed and standardized information prevents reaching a conclusion definitive answer on which technique — microneedling or electrolifting — is more effective in treatment of striae alba or red striae on the breasts.

5. FINAL CONSIDERATIONS

Due to the scarcity of studies, lack of standardization and limited case studies, it was not possible to evaluate the effectiveness of microneedling and electrolifting in the treatment of stretch marks in order to identify which of the techniques is most effective in treating breast stretch marks. This In this way, it is essential to carry out new studies to clarify this problematic, in order to guide safe and effective therapies, benefiting clients and professionals.

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