Protocols for the Treatment of Stretch Marks of the Skin: A Systematic Review of Intervention

Veronica Mendes Soares¹, Amanda Amanda Mendes da Fonseca Benvindo², Deborah Cavalcante Braz³, Otavio da Fonseca Benvindo Filho⁴, Ítalo Tobler Silva⁵, Victory Vitoria Pimentel Martins Felix⁶, Maria das Graças Freire Medeiros de Carvalho⁷

¹Infant Department of the Federal University of Piauí, 64049-550 Ininga, Teresina, Piaui, Brazil
²Medicine Faculty of Health, Imbiribeira Pernambuco, 51150-000, Recife, Pernambuco, Brazil
³Department of Pharmacy of the Federal University of Piauí, 64049-550, Ininga, Teresina, Piaui, Brazil.
⁴Medicine UNINOVAFAPI, Uruguay, 64073-505, Teresina, Piaui, Brazil
⁵Computing Science, 13566-590 São Carlos, São Paulo, Brazil.
⁶Medicine FACID, Fatima, 64052-790, Teresina, Piaui, Brazil
⁷Department of Pharmacy of the Federal University of Piauí, 64049-550 Ininga, Teresina, Piaui, Brazil

Abstract: Introduction: The splines are dermal parallel linear macroscopically apparent scars associated with the atrophy of the epidermis. A desfigurante and a estética condition of skin; if present as splines rubras, who are recent, and the psychological comimpacto white striaitions in patients and without therapeutic options for effective reversal. Objective: To assess randomized clinical tests to demonstrate therapeutic effectiveness of protocols used in dermal splines. Method: Searches of major studies in electronic databases (BVS; MEDLINE/PubMed®; EMBASE; LILACS; Cochrane Library), with search strategy through the following descriptors indexed (DeCS and MeSH). Results: Fourteen manuscripts met the eligibility criteria, but without fully effective results. Limitations in the studies are related to the limited number of patients and high-risk or risk of bias uncertain. Conclusion: More detail and clarity in trials are necessary for more consistent decisions. Keywords: splines. Splines and distension, The dermis, Treatment and splines

1. Introduction

The dermal splines are linear scars perpendicular to the lines of skin tension associated with atrophy of the epidermis [1,2,3].

Although its molecular pathogenesis is not fully understood, evidence shows that stretch marks are caused by rapid stretching of the skin due to pregnancy, weight gain, rapid growth, also caused by diseases such as Cushing's syndrome and excessive use of steroids [1,4,5,6,7].

Result from the combination of constitutional genetic factors, hormonal and mechanical where the glucocorticoids inhibit the activity and the proliferation of fibroblasts more frequent in younger individuals, in adolescence and pregnancy, although it appears at any stage of life [4,8,9]. The most commonly affected sites are the breasts, arms, abdomen, buttocks and thighs[4].

In the extracellular matrix (MEC) proteoglycans (PGs) and glycosaminoglycans (GAGs), what are polysaccharides present in mast cells, along with the elastic and collagenous fibers interact with growth factors and other proteins [10,11].

The histopatológico Elastolysis examination shows the dermis and degranulation of mast cells, with the epidermis adelgaçada, attenuation of the crests, orientation of the bundles of collagen in the horizontal plane, and with elastic fibers bonded making the outer surface of the skin more profound differentiating themselves from normal skin, presenting Microstructural changes and decreased elasticity [12,13].

In spite of the splines not cause significant medical problems we must consider the impact on aesthetics and its effect on the psychological status of patients [14,15,16]. The main treatment modalities with the objective of treating or preventing are the therapies with application of laser, light therapy, with application of acids, particles of collagen, lipólises radiofrequency laser and microdermabrasion, but no determined as "gold standard"; and, therefore, the success of the treatment is still a challenge [4,15,16,17,18].

2. Objective

Assess randomized clinical trials (RCTs), to highlight the therapeutic efficacy of protocols used in dermal splines.

3. Method

3.1 Data Collection

A review was made in the literature. The period of access to data bases was between June and July 2017. There were restrictions in relation to the time period of the studies target
of review, being considered the researches of the last five years, and the study design, being considered only RCTs with restriction of speech in humans.

The strategies for the identification and selection of studies used the methodology of review for survey of major studies from electronic databases (BVS; MEDLINE/PubMed®; EMBASE; LILACS; Cochrane Library), with search strategy through the following descriptors indexed (DeCS and MeSH) in Portuguese: white streaks in the skin, treatment of dermatitic splines, treatment protocol; in the English language: white skin, STRIAE, STRIAE distensae, STRIAE distensae dermal treatment of stretch marks, protocol of stretches, stretch marks, STRIAE distensae, striae rubra, striae alba, lineae striae; in the spanish language: ranuras blanco de la piel.

For the construction of the research question and elaboration of the search strategy, we used the methodology Problem, Intervention, Comparison, Out comes (peak) to search for systematic reviews in the literature. Delineated as question: “What are the protocols for the treatment of stretch marks of the skin available with reverse effectiveness?”.

Combinations between descriptors for specific search in data bases were used (for location of articles indexed) and keywords relating to such descriptors (for recovery of articles in the indexing process), by means of the boolean operator "OR". For the combination of search expressions referring to the problem, interest and context, the boolean operator "AND" was used. English was adopted for all terms, since, for the databases selected, this language retrieves the totality of scientific material recorded, regardless of the language of the original publication.

Criteria for selection of articles: a) primary study and with full text available; (b) the presence of evaluation of therapeutic intervention performed by a researcher or team of researchers, with evaluation of results of operations recorded by assessors and satisfaction of patients; c) publications in English or Spanish, studies were excluded which consisted in: theses, dissertations, government documents, technical reports, newspaper articles, letters to the editor, press releases and articles of revision.

The relevant articles were selected by review of the title and summary and by exclusion of duplicates. The next stage was the reading and reviewing of the full text of articles by three authors to ensure the eligibility criteria. The information collected included: authors, study design, population and sample size, treatment protocol and results assessed for each procedure, the period of the study and evaluation of the methodological weaknesses of the studies selected.

Searches were carried out also in periodicals of CAPEs and through the Program of bibliographic commutation (Comut) through the Central Library of the Federal University of Piauí (UFPI), and were applied as an inclusion criteria: articles randomized clinical trials of treatment in white striations and/or rubras in humans in the past 5 years, with or without blinding. And as a criterion for exclusion: by being out of context, such as the Protocols of prevention; to have publication for more than 5 years; by duality; by not opening the full text and not confirmed if it was an RCT.

The exploitation of data from each study was performed descriptively, allowing a better characterization of protocols and evaluation of the practical applicability of methodological designs found. The results of the substantial analysis of each selected article for characterization and extraction of information addressed were summarized in tables and figures.

Detailed information of the selected studies regarding the study design were collected, the population of patients involved, the treatment protocol and the results found.

The evaluation of the methodological quality was followed by the Cochrane Manual tool for the development of systematic reviews of intervention, version 5.1.0 (Cochrane Handbook).

3.2 Statistical Methodology

The Hierarchical groupings for most similar sequences of the rcts selected and the results of the respective protocols used in these studies were obtained by methods of UPGMA (Unweighted Pair-Group Method Using an Arithmetic Average) from distances of dissimilarity obtained by the algorithm of Gower, expressed by:

$$s_{ij} = \frac{\sum_{k=1}^{K} w_{ijk} S_{ijk}}{\sum_{k=1}^{K} w_{ijk}}$$

Where K is the number of variables ($k = 1, 2, ..., p=$total number of evaluated characteristics); i and j, two works any; $w_{ijk}$ is a weight given in comparison $ijk$, assigning value 1 for valid comparisons and value 0 for invalid comparisons (when the value of the variable is missing); $S_{ijk}$ is the contribution of the variable $k$ in the similarity between the jobs i and j, having values between 0 and 1. For a nominal variable: if the value of the variable $k$ is the same for both work, i and j, then $S_{ijk} = 1$, otherwise it is equal to 0.

The assessment of the existence of possible distortions caused in the grouping was performed with the interpretation of the coefficient of correlation between the distance matrix (dissimilarity) between jobs ($X$) and the Cophenetic matrix obtained from the analysis of grouping ($T$), called the cophenetic correlation coefficient ($\rho$).

The coefficient is described as the following expression:

$$\rho = \frac{\sum_{i,j} (x(i,j) - \bar{x})(t(i,j) - \bar{t})}{\sqrt{\sum_{i,j} (x(i,j) - \bar{x})^2 \sum_{i,j} (t(i,j) - \bar{t})^2}}$$

In that $\bar{x}$ (i, j) = | $X_i - X_j |$, the normal euclidean distance between the observations i and j and t (i, j) = dendrogramática distance between points of the model Ti and Tj.

4. Result

In each survey ECRs of treatment protocols for white striations and rubras in humans in the past 5 years were selected. A total of 122 articles were selected by 69 have no duality, and these articles found in the study were excluded 42 per deal protocols for prevention of stretch marks; and excluded 11 articles for being out of context. 16 articles...
Were evaluated for eligibility, and these 2 have not opened the full text and we cannot confirm whether they were true rcts; resulting then in 14 selected rcts published in the period from 2013 to 2017 with a total of 354 patients (Figure 1).

Evaluated the combinations of protocols highlighting: were Dermabrasion and Tretinoina; CO2 Laser fractionated and Tretinoina + Glycolic Acid; Platelet-rich plasma (PRP) and Microdermabrasion; Microagulhamento and CO2; CO2 fractional fractioned and Intense Pulsed Light and other combinations. Emphasis will be made to the studies of Khater et al (2016), where it was applied CO2 fractional versus Microagulhamento with the same number and range of sessions. Nine of the 10 patients treated with a needle (90%) showed improvement and only two patients (20%) did not respond in the same intensity; however, one patient (10%) presented no improvement after treatment. In comparison, patients treated with CO2 laser, five of 10 patients (50%) showed clinical improvement; and five patients (50%) showed no improvement. The author concludes the overlap of the use of Microneedles on CO2 lasers for the treatment of stretch marks (Table 1).

For each study included in the analysis was performed data extraction by researchers and the risks of trends were evaluated in 5 areas - generation of random sequence; allocation concealment, blinding of participants and staff; evaluation of results; data from incomplete results. Based on the risk of bias according to the Cochrane Manual the studies were classified into 3 categories: (1) low risk of bias / low risk of bias for all key areas; (2) an uncertain risk of bias / obscure risk of bias for 1 or more key areas; and (3) high risk of bias / high risk of 1 or more key areas (Table 4).

The selected trials were submitted to trial for each domain. The delineation of articles evaluated by the method used to assess the degree of risk of bias of rcts showed a high risk of bias or risks inserts in the generation of random sequence and blinding of participants and professionals; and that in any study reports if these parameters have undertaken or not the results of research performed. In some of them there was a lack of comparison or control group and still insufficient data to trial these biases.

The majority of articles revealed blinding of assessors characterizing low risk of bias and in a smaller number of studies do not reveal whether or not this was blinding. Only one article with incomplete outcome having as a cause weight gain, withdrawal of consent, by contact dermatitis and loss of follow-up (Table 5).

The possible biases in the process of a review indicate the strengths and limitations of the studies. The validity of the results of the studies it is essential to draw conclusions about the effects of an intervention, and provide the best and most up-to-date available evidence about the effects of interventions for use by consumers, clinicians and decision-makers; to inform the decisions of health. To assess the risk of bias means directing the extent to which the results of the studies included should be accredited.

In this study there was no selective reporting, making the results applied by protocols such as reliable, i.e., low risk for this bias.

The responses were synthesized separately for each procedure adopted in each study. These data comes to show the poverty of therapeutic response to the available protocols and yet without fail to cause discomfort and other adverse effects, which were present in all protocols in greater or lesser emphasis, except in the study protocol using silicone gel versus placebo gel. The answers were between weak and moderate, having as best results in protocols where fractionated CO2 laser was applied and with the use of platelet-rich plasma in white streaks, and Nd:YAG laser in splines rubras. The protocols with Tretinoin 0.01% also in splines albas revealed moderate response. But in no study at the end of the Protocol there was total recovery of the skin.

The purpose of the protocols relapsed on the collagen fibers and elastic, with changes in their structures: thickening and arrangements. Although some studies reported an increase of dermal papillae and thickening of the epidermis, there have been no reports whether it was by arrangement of collagen fibers or by an increase in the number of cells, which would lead to think in a recovery of the ability to author skin regeneration; and may not, however, be completed in the evaluation of any protocol applied (Table 8).

5. Figures for Publication

![Figure 1: Flow diagram of selection of primary studies of systematic review. Source: SOARES, 2018.](www.ijsr.net)
Number and arrangement of elastic and collagen fibers

Parameters evaluated:

- Area of splines and patients' satisfaction
- Parameters: width, length of the splines and collagen thickening of the dermis
- Evaluation of patients

**Group 1:**
- 15 received superficial dermabrasion (16 weekly sessions)
- Parameters: width, length of the splines and satisfaction of patients
- Randomized and open
- Do not blind
- 32 Women
- Phototype I-IV
- Estriae rubra
- Result: The interventions had similar efficacies, but the superficial dermabrasion has fewer side effects and better patient adherence.
- Reference: HEXSEL (2014)

**Group 2:**
- 46 splines fractionated CO2 Laser (5 sessions)
- Parameters evaluated: Area of splines and patients' satisfaction
- Simple random sampling
- Evaluator blinded
- 6 Women
- 30 years
- Fitzpatrick skin type III and IV
- Estriae alba
- Result: Significantly better use of CO2 compared to glycolic acid and Tretinoin
- Reference: NAEIN (2014)

**Group 1:**
- Placebo gel
- Gel: silicone gel
- Apply 1 time per day for 90 days
- Parameters: The dermis thickness, number and arrangement of elastic and collagen fibers
- Double-blind: Patients and assessors
- 20 Women
- 37 years (18 to 52)
- Estriae alba and rubra
- Result: Best result with silicone gel

**Group 1:**
- Fractional radiofrequency (FMR)
- Group 2: Frequency + CO2 fractional laser fractionated (FMR + CO2)
- Parameters: surface area of ribs; Subjective evaluation of participants
- Random allocation
- Evaluators blind
- 6 Women
- (48 pairs of ribs)
- Striae Alba
- Result: Best result in Group 2: FMR + CO2
- Reference: NAEIN (2016)

**Group 1:**
- Fractional CO2 Laser fractionated 40 mJ/pulse width of 4 ms /scanning area 10 mm x 10 mm, 5 months (monthly sessions)
- Group II: intense pulsed light 590 nm, 20 to 30 J/cm2, 5 months (fortnightly sessions).
- Parameters evaluated: surface area of the splines
- Randomization centered on methodological center.
- Evaluators blind (2)
- Professional and the patient also evaluated
- 40 Women
- 23 to 48 years
- Estriae alba and rubra
- Result: The fractional CO2 laser is more effective than the IPL in the same duration of treatment and with fewer treatment sessions
- Reference: EL TAIIEB (2016)

**Group 1:**
- Bipolar radiofrequency potentized with infrared (IR)
- Group 2: bipolar radiofrequency fractionated
- Group 3: bipolar radiofrequency
- Group 4: control. 3 monthly sessions
- Parameters evaluated: Depth of the splines
- Randomization centered on methodological center.
- Evaluators blind (2)
- Professional and the patient also evaluated
- 22 Patients
- (Men and women)
- > 18 years Striae Rubra and Alba patients completed the treatment
- Effective Treatment in Group 1: Fractionated bipolar RF + Go
- Reference: HARMELI N (2016)

**Group 1:**
- Microagulhamento, 1 session per month. 3 Sessions
- Group 2: CO2 fraction, 1 session per month 3 sessions
- Parameters evaluated: Provision of elastic fibers and collagen thickening of the dermis
- Evaluators blind
- 20 Patients
- Best result in Group 1 Microagulhamento

**Group 1:**
- Microagulhamento: 3 (1 sessions each 4 weeks)
- Parameters evaluated: Thickness of the epidermis
- Number and arrangement of elastic and collagen fibers
- Evaluation of patients
- Evaluators blind
- 16 patients (14 - 44 years)
- Striae alba and rubra
- 43.8% of the patients: excellent improvement
- 56.2% of the patients: minimal to moderate improvement
- 37.5% of the patients: highly satisfied
- Reference: PARK (2012)

**Group 1:**
- Intradermal RF + autologous PRP
- Evaluators blind
- 19 Patients
- 42.1% of the participants
- Reference: KIM

**Table 1:** Selected studies of treatment protocols of dermal splines
Parameters evaluated: number and arrangement of elastic and collagen fibers. Evaluation of patients

**Legend:**
- PRP (Platelet-rich plasma)
- Nd:YAG Laser
- Er:YAG (Erbium-doped Yttrium theluminium garnet)

**Source:** SOARES, 2018

**Table 4: Different Aspects of risk of bias**

<table>
<thead>
<tr>
<th>Article</th>
<th>Generation of random sequence</th>
<th>Allocation concealment</th>
<th>Blinding of participants and professionals</th>
<th>Blinding of assessors of the outcome</th>
<th>Incomplete Outcome</th>
<th>Report of selective outcome</th>
<th>Other sources of bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEXSEL (2014)</td>
<td>Insufficient data</td>
<td>List of randomization</td>
<td>Do not blind. And not reporting alters the outcome</td>
<td>The study does not report information</td>
<td>Data loss and is related to the outcome investigated</td>
<td>Protocol and outcome report available</td>
<td>Seems to be free from other biases</td>
</tr>
<tr>
<td>NAEIN (2014)</td>
<td>Randomly by the professional judgment</td>
<td>Simple random sampling Randomization is open</td>
<td>Do not blind. No reports if you change the outcome</td>
<td>Blinding of assessors and unlikely to have been broken.</td>
<td>There was no loss of data</td>
<td>Protocol available</td>
<td>Seems to be free from other biases</td>
</tr>
<tr>
<td>UD-DIN (2013)</td>
<td>Insufficient data</td>
<td>Packaged Products of identical forms</td>
<td>Blinding of participants</td>
<td>Blinding of assessors and unlikely to have been broken.</td>
<td>There was no loss of data</td>
<td>Protocol available</td>
<td>Without a control group</td>
</tr>
<tr>
<td>Ibrahim (2015)</td>
<td>Insufficient data</td>
<td>Insufficient data</td>
<td>Do not blind. No reports if you change the outcome</td>
<td>Not reporting this information</td>
<td>There was no loss of data</td>
<td>Protocol available</td>
<td>Seems to be free from other biases</td>
</tr>
<tr>
<td>GUNGOR (2014)</td>
<td>Insufficient data</td>
<td>Insufficient data</td>
<td>Not reporting this information</td>
<td>Blinding of assessors and unlikely to have been broken.</td>
<td>There was no loss of data</td>
<td>Protocol available</td>
<td>Seems to be free from other biases</td>
</tr>
<tr>
<td>NAEIN (2016)</td>
<td>For the judgment of the professional</td>
<td>Insufficient data</td>
<td>Not reporting this information</td>
<td>Blinding of assessors and unlikely to have been broken.</td>
<td>There was no loss of data</td>
<td>Protocol available</td>
<td>Seems to be free from other biases</td>
</tr>
<tr>
<td>EL TAIEB (2016)</td>
<td>Insufficient data</td>
<td>Insufficient data</td>
<td>Not reporting this information</td>
<td>Blinding of assessors and unlikely to have been broken.</td>
<td>There was no loss of data</td>
<td>Protocol available</td>
<td>Seems to be free from other biases</td>
</tr>
<tr>
<td>HARMELIN (2016)</td>
<td>Concealment by a central</td>
<td>Insufficient data</td>
<td>Not reporting this information</td>
<td>Blinding of assessors</td>
<td>There was no loss of data</td>
<td>Protocol available</td>
<td>Seems to be free from other biases</td>
</tr>
<tr>
<td>KHATER (2016)</td>
<td>Insufficient information</td>
<td>Insufficient data</td>
<td>Not reporting this information</td>
<td>Blinding of assessors</td>
<td>There was no loss of data</td>
<td>Protocol available</td>
<td>Seems to be free from other biases</td>
</tr>
<tr>
<td>PARK (2012)</td>
<td>Insufficient information</td>
<td>Do not hide</td>
<td>Not reporting this information</td>
<td>The study reports This information</td>
<td>There was no loss of data</td>
<td>Protocol available</td>
<td>Insufficient information</td>
</tr>
<tr>
<td>KIM (2012)</td>
<td>Professional Judgment</td>
<td>Do not hide</td>
<td>Insufficient information</td>
<td>Blinding of assessors and Unlikely to have</td>
<td>There was no</td>
<td>Protocol available</td>
<td>Insufficient information</td>
</tr>
</tbody>
</table>
### Table 5: The level of risk of bias based on judgments for each study

<table>
<thead>
<tr>
<th>Article</th>
<th>Generation of random sequence</th>
<th>Allocation concealment</th>
<th>Blinding participants and professionals</th>
<th>Blinding of assessors of outcome</th>
<th>Incomplete Outcome</th>
<th>Report of selective outcome</th>
<th>Other sources Bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEXEL (2014)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>NAEIN (2014)</td>
<td>+++++++++++++++++</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>UD-DIN (2013)</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Ibrahim (2015)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>GUNGOR (2014)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>NAEIN (2016)</td>
<td>+++++++++++++++++</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>ELTAIEB (2014)</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>HARMELIN (2014)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>KHATER (2016)</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>PARK (2012)</td>
<td>+++++++++++++++++</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>KIM (2012)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>SHOKEIR (2014)</td>
<td>+++++++++++++++++</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>EL SAIE (2016)</td>
<td>+++++++++++++++++</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>MUHSIN (2013)</td>
<td>+++++++++++++++++</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

Legend: Low risk: +; High risk: +++++++++; Risk uncertain: ---

Source: SOARES, 2018

### Table 6: Number of articles correlated to the risk of bias

<table>
<thead>
<tr>
<th></th>
<th>Generation of random sequence</th>
<th>Allocation concealment</th>
<th>Blinding participants and professionals</th>
<th>Blinding of assessors of outcome</th>
<th>Incomplete Outcome</th>
<th>Report of selective outcome</th>
<th>Other sources Bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>7</td>
<td>6</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Low</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>5</td>
<td>13</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>Uncertain</td>
<td>4</td>
<td>5</td>
<td>9</td>
<td>9</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Source: SOARES, 2018

### Table 7: Protocol Applied / Type of stria

<table>
<thead>
<tr>
<th>Protocols used</th>
<th>Type of splines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dermabrasion X Tretinoin 0.05%</td>
<td>Stria Rubra</td>
</tr>
<tr>
<td>CO2 Laser X Tretinoin 0.05% + Glycolic Acid 10%</td>
<td>Stria Alba</td>
</tr>
<tr>
<td>Silicone Gel X Placebo</td>
<td>Stria Rubra and Alba</td>
</tr>
<tr>
<td>Microdermabrasion PRP X (PRP+Microdermabrasion)</td>
<td>Stria Rubra and Alba</td>
</tr>
<tr>
<td>Nd:YAG X Er:YAG</td>
<td>Stria Rubra and Alba</td>
</tr>
<tr>
<td>Fractional frequency X CO2 fractional Radiofrequency Fractioned +</td>
<td>Stria Alba</td>
</tr>
<tr>
<td>Fractionated CO2 X Intense Pulsed Light</td>
<td>Stria Alba</td>
</tr>
<tr>
<td>Bipolar radiofrequency enhanced with IR light X Bipolar radiofrequency fractionated X Bipolar radiofrequency</td>
<td>Stria Rubra and Alba</td>
</tr>
<tr>
<td>Microneedles X CO2 Laser</td>
<td>Stria Rubra and Alba</td>
</tr>
<tr>
<td>Microagulamento</td>
<td>Stria Rubra and Alba</td>
</tr>
<tr>
<td>Intradermal RF + PRP</td>
<td>Stria Alba</td>
</tr>
<tr>
<td>Pulsed dye laser (PDL) X Intense Pulsed Light (IPL)</td>
<td>Stria Rubra and Alba</td>
</tr>
<tr>
<td>Nd: YAG 75 J/cm2 X Nd: YAG 100 J/cm2</td>
<td>Stria Rubra and Alba</td>
</tr>
<tr>
<td>Intense Pulsed Light: 650 nm X 590 nm</td>
<td>Stria Rubra</td>
</tr>
</tbody>
</table>

Legend: - PRP Platelet-rich plasma; Nd:YAG(neodymium - DOPED Ytrrium theluminium garnet); Er:YAG(Erbium-doped Ytrrium theluminium garnet).

<table>
<thead>
<tr>
<th>Procedures performed</th>
<th>Answers</th>
<th>Adverse Effects</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEXSEL (2014):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dermabrasion Tretinoina</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>NAEIN (2014):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fractionated CO2 Laser Tretinoina 0.5% + Glycolic Acid 10%</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>UD-DIN (2013)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silicone Gel Placebo Gel</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ibrahim (2015)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRP Dermabrasion 1%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dermabrasion + PRP</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>GUNGOR (2014):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nd:YAG Laser Er:YAG Laser</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>NAEIN (2015): Radio frequency with micro needles alone</td>
<td>Radio frequency with micro needles + CO2</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>EL TAEIB et al (2016):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fractionated CO2 Laser Intense Pulsed Light</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HARMELIN (2016):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bipolar radiofrequency Fractionated CO2 Laser</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Bipolar radiofrequency + infrared light</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>KHATER (2016):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microneedle CO2 Laser</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PARK (2012):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microagulhamento</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>KIM (2012):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intradermal RF + PRP</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>SHOKEIR (2014):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulsed dye laser (PDL) Intense Pulsed Light ( IPL)</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>ELSAE (2016):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nd:YAG 1064 nm: 75 J/cm2 100 J/cm2</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>MUHSIN (2013):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intense Pulsed Light: 650 nm 500 nm</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Legend: F(few), M (moderate), MR(best response); Nd:YAG (Nd-doped yttrium yttrium aluminum garnet); Er:YAG (Erbium-doped yttrium yttrium aluminum garnet); PRP (platelet rich plasma); (increases ▲ (decreases); ▼ (there was no adverse effect))

Source: SCARES.2018.
Figure 3: DENDROGRAM of dissimilarity of jobs according to different aspects of risk of bias

Figure 4: DENDROGRAM of dissimilarity of jobs according to the degree of risk of bias based on judgments for each study
Source: SOARES, 2018

Figure 5: DENDROGRAM of dissimilarity of jobs according to the responses to treatment protocols are applied.
Source: SOARES, 2018

References


[6] MUHSIN A, AL-DHALIMP & ALI A, ABO NASRYIA. A comparative study of the effectiveness of intense pulsed light wavelengths (650 nm vs 590 nm) in


