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**REVIEW ARTICLE** **OPEN ACCESS**

# Tretinoin 0.05% Cream vs platelet rich plasma in striae distensae: A review

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**ABSTRACT**
*Stretch marks, also known as striae distensae (SD), are noticeable linear scars that appear where dermal damage has occurred as a result of excessive stretching of the skin. It is a very common skin condition and can be due to weight loss, weight gain, drugs or any illness. It is unsightly and bothersome for some people. Hence, there are many treatment modalities to decrease the visibility of straie distensae. PRP and topical retinoids both act upon striae distensae in their own respective ways.It can be concluded from the available literature on the subject that out of the two treatment modalities, PRP and topical retinoids, PRP is better in terms of results with lesser side effects.*
***Key words**: Striae distensae, Strech marks, Tretinoin, Platelet rich plasma*

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## INTRODUCTION

Stretch marks, also known as striae distensae (SD), are noticeable linear scars that appear because of excessive stretching of the skin causing dermal damage. It is more commonly seen in females [1].

Platelet-rich plasma (PRP) is abundant platelets concentrated into a small volume of plasma, rich in growth factors like platelet derived growth factor (PDGF) that has role in wound healing, angiogenesis and tissue remodeling [2].

Topical retinoid act primarily on the keratinocytes by binding with specific receptors in the nucleus. Topical retinoids undergo transcription after binding to specific receptors on keratinocytes at molecular level. This results in interference in gene transcription which regulates keratinocyte proliferation and differentiation [3].

There are many treatment modalities available for straie distensae in today's era. Amongst the topicals we have molecules like glycolic acid and retinoids. Surgical procedures such as dermabrasion, PRP, carboxytherapy and microneedling alone or in combination with PRP are also available that work in striae distensae. PRP and topical retinoids both act upon striae distensae in their own respective ways. This literature review on the subject is being conducted to see which of the two modalities works better for the patient.

### Platelet rich plasma vs topical retinoids

Ash et al[4]in 1998 did a study on comparison of topicals for striae alba. Ten patients with alba type straie distensae and I-V skin types were chosen for this study. Patients were told to topically apply MD Forte that contains 20% glycolic acid to the whole treatment area once daily. Additionally, 10% L-ascorbic acid with 2% zinc sulphate, and 0.5 percent tyrosine was also applied on half of the treatment areawhileon the other half 0.05 percent tretinoin cream (Renova) was applied. Histopathological evaluations were also carried out on all patients. These data were analysed, and it was seen that both regimens can lessen the visibility of stretch marks. Topical treatment for stretch marks using 20% glycolic acid and 0.05% tretinoin emollient cream can increase the amount of elastin in the reticular and papillary dermis. Both regimens also raised epidermal thickness and decreased papillary dermal thickness as compared to the control group.

Rangel et al in 2001 [5]did a study on treating pregnancy related abdominal striaewith topical retinoid which is a prospective study with a sample size of twentyfemales who applied 0.1 percent tretinoin cream once a day regularly for 3 consecutive months to pregnancy-related stretch marks over the abdominal region. By analyzing one pre-selected selected lesion and rating it on a one to four scale, effectiveness was assessed. At twelve weeks, all stretch marks showed considerable overall improvement from baseline,

and the target lesion's length shrank by 20%. The most frequent adverse reactions, erythema and scaling, were experienced by 11 individuals, got better after the first month of treatment, and were managed by continuing to use ointment containing tretinoin with petroleum jelly. In this small study, topical tretinoin administration significantly improved the clinical appearance of stretch marks associated with pregnancy.

Su Kim et al [6] in 2012 in their study on efficacy of intradermal radiofrequency along with platelet-rich plasma in striae distensae.Each patient underwent three sessions of autologous PRP and intradermal RF spaced four weeks apart. Only one of the 19 patients had good improvement at four weeks post-treatment, whileremarkable improvement was seen in seven patients,moderate improvement in six patients, andmild improvement was seen in five patients. SDs did not deteriorate in any of the patients. More than fifty percent of patients were very satisfiedwith the treatment. The authors came to the conclusion that striae distensae may respond well to intradermal RF coupled with autologous PRP.

Hexsel et al [7] in 2014 studied the efficacy ofsuperficial dermabrasion vs topical tretinoin cream on early SD in thirty-two women. Superficial dermabrasion was given to one group weekly for a period of sixteen weekswhile the other group was given tretinoin cream 0.05%once a day to be applied topically. Striae dimensions were measured and comparisonof both the groups were made. Both treatments were equally effective, but superficial dermabrasion had a lower side effects and hence patients found it better.

Zeinab *et al* [8] in 2015 did a comparative study on safety and efficacy of platelet rich plasma vs microdermabrasion in striae distensae clinically and histopathologically. Total 68 patients who had striae distensae were randomly allocated into three groups as per therapeutic modalities. Patients in group 1 received PRP intradermal alone, patients in group 2 received microdermabrasion alone, and patients in group 3 received a combination of the two treatments. All patients underwent 6 sessions with 2 weeks interval between each session. It was found that in comparison to patients treated with microdermabrasion, there was a significant clinical improvement of SD in patients who were treated with PRP and in patients who were treated with both PRP and microdermabrasion. Skin biopsies were taken from some patients at baseline, 3 months and at the last sessions which were stained to study histopathological changes and efficacy of treatment. At the conclusion of the treatment sessions, the dermis had much more collagen and elastic fibres. The authors came to the conclusion that PRP is more efficient in treating SD, however it is preferable to combine the two for greater and quicker efficacy.

Prapote *et al* [9] in 2017 did a study on comparison of herbal extract cream and tretinoin 0.1 percentcream on striae alba. 48 volunteers with striae alba at their thighs and ages ranging from 10 to 19 were randomly assigned to two groups. For 16 weeks, 0.1 percent tretinoin and a herbal extract were administered separately to each group. The striae width decreased by 13.09 % in the herbal extract group and 9.01 % in the tretinoin group as compared to the original lesions. In the tretinoin group, the length was cut by 9.54 %, whereas in the herbal extract group, it was cut by 8.73 %. In the tretinoin group, 13.70% patients showed decrease in the roughness of the surface measured by Visioscan VC98, while in the herbal extract group, it was reduced by 17.24%. According to H&E staining, the average difference in epidermal thickness between the tretinoin and herbal extract groups was 4.79 microns and 14.22 microns, respectively. In the tretinoin group, the mean difference in collagen amount was 13.75 units; in the herbal extract group, it was 6.60 units. Mean difference in collagen amount was less in tretinoin using group than that of herbal extract using group. Only 4.55 % who took the herbal extract developed irritating contact dermatitis, compared to 72.73 % who used tretinoin. The treatment of striae alba with a cream containing a herbal extract was shown to be as beneficial to a cream containing tretinoin. The herbal extract may be a more effective alternative therapy because tretinoin might irritate the skin.

Ahmed *et al* [10] in 2019 did a study comparing efficacy and tolerability between carboxytherapy, platelet-rich plasma, and tripolar radiofrequency in striae distensae. Based on the types of therapy used, patients were classified into three groups. Carbon dioxide (CO2) injections were used for carboxytherapy in Group A patients, autologous platelet-rich plasma (PRP) was injected intradermally in Group B patients, and tripolar radiofrequency was used to treat Group C patients (RF). There were no statistically significant differences between the three groups but clinical improvement in terms of dimension and texture was seen after treatment in all the groups. Patient satisfaction was statistically substantially highest in group C and least in group B with more side effects. The three therapy modalities were found to be effective in treating both forms of striae clinically and histopathologically, and they were well tolerated by patients with only temporary side effects.

Gamil *et al* [11] in 2018 did a study on Platelet rich plasma vs tretinoin in treatment of striae distensae. Significant statistical improvement was seen with both the treatment modalities. But the patients who received PRP showed a noticeably better results. All samples taken after treatment showed an increase in dermal collagen and elastic fibres.

Hodeib et al [12] in 2018 did a comparative study on efficacy of carboxytherapy versus platelet-rich plasma in treatment of stretch marks clinically and immunohistochemically. Twenty patients with striae alba were included in his investigation. Every patient underwent 4 sessions of carboxytherapy and 4 sessions of PRP injection in their right side (group A) and left side (group B), respectively in a duration of 3-4 weeks. Before and after the therapy, skin biopsies were taken, and they were stained with a fibronectin immunohistochemical solution. In both the groups striae alba significantly improved following the treatment. There was no discernible distinction between the two groups.

Haishan Lu et al [13] in 2020 did a systemic review and meta-analysis comparing the effectiveness of different therapies in striae distensae. There were 14 trails with 651 subjects that matched the criteria. The findings of the studies indicate that topical application of tretinoin mixed with bipolar radiofrequency was closely followed by bipolar radiofrequency as the method most likely to increase clinical effectiveness and patient satisfaction in treating SD. When it comes to clinical effectiveness and patient satisfaction among laser treatments, $CO_2$ fractional lasers outperform other lasers. According to statistics, topical tretinoin performed the poorest when it came to increasing the clinical efficacy and patient satisfaction rate of SD treatment. The authors advised using combination of bipolar radio frequency along with topical tretinoin for striae distensae based on the findings of meta-analysis. The widely used CO2 fractional laser can be thought of as a potential alternative therapy option.

Isabella Sawtez et al [14] in 2021 did a systematic review on platelet rich plasma in straie distensae. Out of 12 studies, 6 studies had matched inclusion criteria's, 2 studies had no control groups, 2 used intra-individual comparison and one study performed histopathological evaluation. This systemic review key findings included decreased inflammatory cell infiltration and enhanced epidermal thickness, rete ridge creation, and collagen formation following several PRP treatments.

Amira A et al [15] in 2022 did a clinicopathological analysis in microneedling alone versus microneedling with platelet rich plasma. The forty SD patients were split into two groups:

Group I: Received MN-only treatment

Group II: Received combined MN-PRP treatment.

Therapy with combined MN-PRP was linked to the following outcomes when compared to the use of MN alone:

(i) Significant improvement of SD skin lesions

(ii) Increased laying down of collagen and elastic fibres in the dermis

The authors came to the conclusion that treating SD lesions with a combination of MN and PRP is more effective than using MN alone.

Suruchi Garg et al [16] in 2021 did a review article on progress of platelet rich plasma in interventional dermatology and trichology. According to recent studies, PRP is a safe, easily prepared, less invasive procedure with little recovery time and a very low risk of allergic responses due to its autologous nature. It also appears to successfully stimulate angiogenesis, collagen as well as elastin regeneration. It has had remarkable success in the treatment of melasma, striae distensae, chronic ulcers and scars due to acne, burns or trauma, when used alone or in conjunction with microneedling or ablative lasers.

## CONCLUSION

Striae distensae is a very common skin condition and can be due to weight loss, weight gain, drugs or any illness. Though it is unsightly but it might be normal for some people and bothersome for some. Hence, there are many treatment modalities to decrease the visibility of straie distensae. Topicals including retinoids or glycolic acid and procedures like PRP, carboxytherapy both showed clinical improvement in various studies. The result with procedural modality was better as compared to topicals in terms of patient satisfaction. The side effects with topicals are a main concern for the patient resulting in poor compliance.Advantage with procedural modalities is that they are better with patient compliance due to fixed number of sessions, faster results and the side effects are also for a shorter period. It can be concluded from the above studies that out of the two treatment modalities, PRP and topical retinoids PRP is better in terms of results with lesser side effects.

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