

Possible Role of Platelet -Rich Plasma for Striae Distensea

Management: Review Article

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ABSTRACT

Background: Atrophic skin Strain scars, also known as striae or striae distensa, are a typical variety of atrophic dermal scars that are covered by a thicker, less elastic layer of epidermis. While initially appearing pink (as striae rubra), striae distensae eventually turn white (striae alba). Platelet-rich plasma (PRP) is an effective therapeutic option for striae rubra.

Objective: Assessment of possible role of platelet -rich plasma for striae distensea management.

Methods: We looked for data on striae distensa and Platelet -Rich Plasma in medical journals and databases like PubMed, Google Scholar, and Science Direct. However, only the most recent or extensive study was taken into account between October 2006 and July 2021. References from related works were also evaluated by the writers. There are not enough resources to translate documents into languages other than English, hence those documents have been ignored. It was generally agreed that documents such as unpublished manuscripts, oral presentations, conference abstracts, and dissertations did not qualify as legitimate scientific study. **Conclusion:** New and promising in the treatment of striae distensa, platelet-rich plasma (PRP) poses no danger of hyperpigmentation or infection.

Keywords: Platelet -Rich Plasma, Striae distensea, Atrophic skin Strain scars.

INTRODUCTION

Striae distensa, also known as atrophic dermal scars, are a common kind of striae atrophica that appear on the skin. Over time, striae distensae go from pink (striae rubra) to white (striae alba) ⁽¹⁾. Stretch marks, also called strain scars, are linear lesions of atrophic skin characterised histologically by epidermal atrophy, missing rete ridges, and abnormalities in architecture of connective tissue. The precise pathophysiology of striae distensae is not yet understood, however there is some indication that hormonal excess, mechanical stress, and genetic susceptibility all play a part in the formation of this illness. Several treatments have been

explored, but none have demonstrated significant benefit ⁽¹⁾.

Females are at a higher risk for developing striae distensae due to hormonal changes during puberty, pregnancy, and obesity (2.5 times higher). Pregnant women have a prevalence of SD between 43% and 88%, and teenagers between 6% and 86%.

A prevalence of 43% has been recorded among those with a BMI between 27 and 51, who are considered to be obese. There are also wide variations in reported prevalence across other patient populations, including adult males and women who are not pregnant ⁽¹⁾.

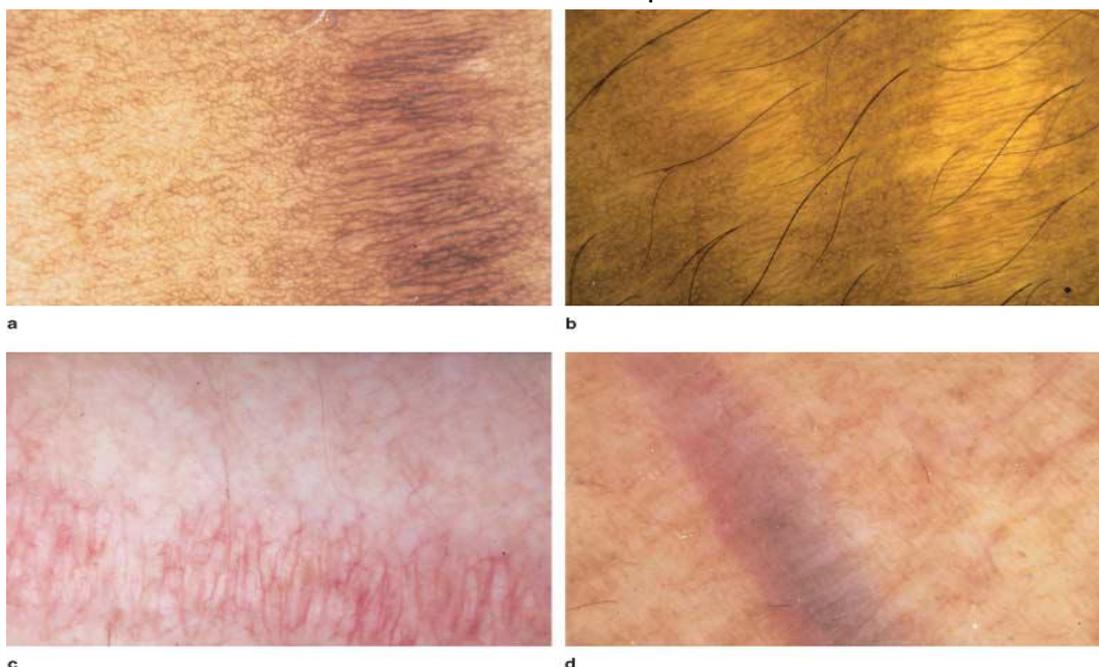


Figure (1): Features of striae distensae visible on the skin's surface. (a) Stria nigra, (b) stria alba, (c) stria rubra, (d) stria cerulea ⁽²⁾.

Platelet-rich plasma (PRP) is an exciting new treatment option in dermatology. PRP is an autologous serum with a platelet content above baseline concentration (150000-350000/uL).

Many dermatological diseases, including wound healing, inflammation reduction, and cosmetic purposes, have benefited from its application ⁽³⁾.

Preparation of platelet – rich plasma:

Centrifugation may be accomplished in a variety of ways. Methods differ in how long they are, how fast they spin, and how many times they stop and start the centrifuge. To keep platelets from breaking apart and secreted proteins from being prematurely released, low

centrifugation speeds are advised. When anticoagulated blood is centrifuged, three distinct layers are collected: plasma, red blood cells, and white blood cells and platelets. Three distinct plasma layers can be identified depending on the platelet concentration.

The most abundant, intermediate, and least abundant portions are the platelet-poor, intermediate, and platelet-rich portions, respectively (**Figure 2**).

Pipetting allows us to divide the sample up into its component parts and store them in individual, sterile tubes. PRP is activated by platelet activators like calcium chloride or thrombin so that platelets degranulate and release growth factors and other bioactive substances ⁽⁴⁾.

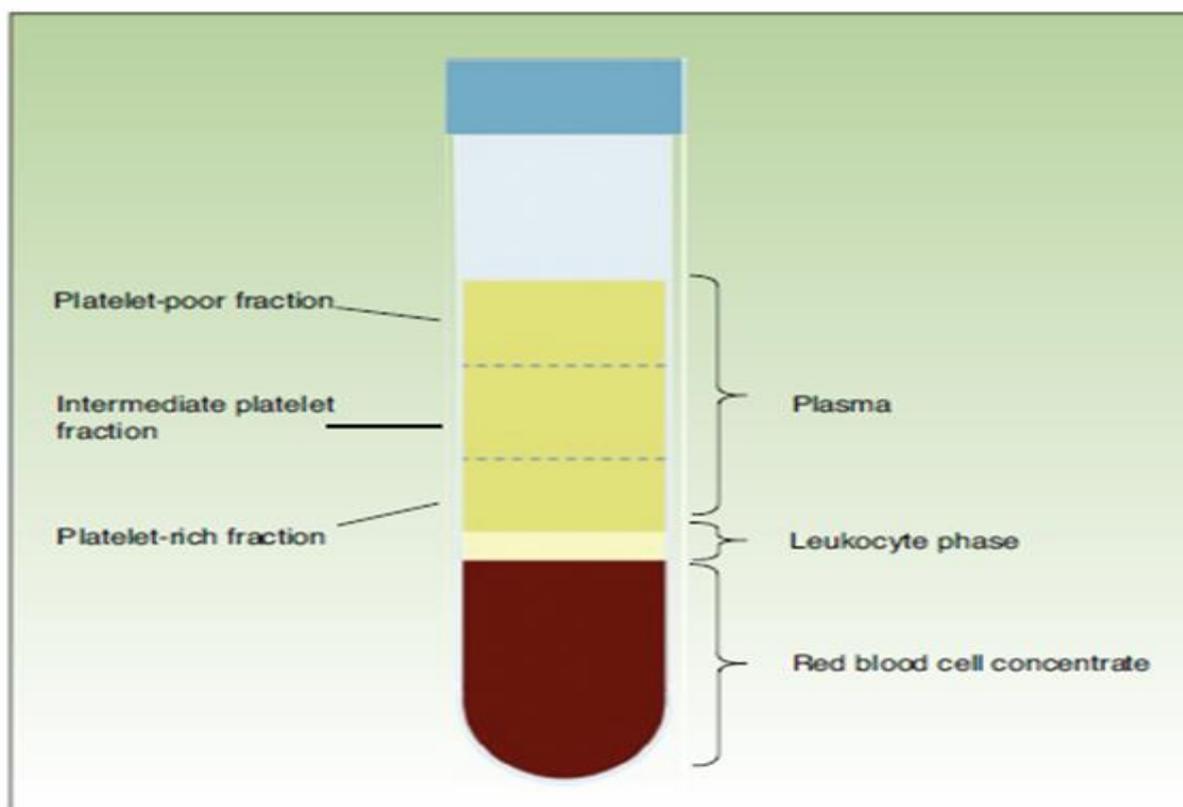


Figure (2): Centrifuged samples of anti-coagulated blood provide a variety of fractions ⁽⁴⁾.

Applications of PRP in dermatology:

The field of dermatology makes extensive use of platelet-rich plasma ⁽⁵⁾.

Hair Restoration:

When applied to patients suffering from androgenic alopecia, PRP has shown promising results in promoting hair growth (AGA). Growth factors in platelet-rich plasma (PRP) have been shown to stimulate anti-apoptotic pathways, initiate and extend the proliferative anagen phase of hair follicles, enhance perifollicular vascularization, and improve dermal papilla fibroblast survival, all of which are necessary for hair regrowth. Alopecia areata, androgenetic alopecia, and female-pattern baldness are all treatable with PRP ⁽⁶⁾.

Skin Rejuvenation:

PRP therapy has been demonstrated to lessen the visibility of acne scars and surgical scars. PRP has been shown to increase collagen density and skin elastic fibres, both of which are important in cosmetic dermatology. Additional improvements in skin look are achieved when Collaborative treatments that incorporate PRP include laser procedures, microneedling, and hyaluronic acid injections. Preliminary results from combining autologous fat grafting with platelet-rich plasma to improve fat survival over the long term are promising ⁽⁷⁾.

Acne Scars & Traumatic Scars:

It has been established in several clinical trials that using PRP can considerably lessen the visual severity of acne scars and other traumatic scars. Scar tissue that forms as a result of a cut or scrape can affect both the look and the performance of the affected area. Results from optical coherence tomography showed that combining PRP with fractional laser therapy for acne scars was more effective than either treatment alone ⁽⁷⁾. When PRP is used to treat acne scars, redness and swelling fade. When scars are treated, the skin becomes more elastic, and collagen and fibroblast production are boosted ⁽⁸⁾.

Combination Therapies: Lasers & Microneedling:

More and more patients are opting for PRP treatments in cosmetic dermatology, which are sometimes combined with laser therapy and microneedling. Both microneedling and fractional laser resurfacing can increase PRP absorption and distribution because they create tiny holes in the skin. When used in conjunction with laser therapies and microneedling procedures, platelet-rich plasma (PRP) has been shown to hasten healing, shorten recovery time, and reduce erythema and melanin index in treated areas. Combining PRP with device treatments has been proven to significantly decrease transepidermal water loss (TEWL) and inflammatory hyperpigmentation.

Skin elasticity is enhanced, fibroblast numbers are increased, and collagen bundle thickness is significantly greater in PRP-treated patients than in those who underwent CO₂ or erbium fractional resurfacing alone ⁽⁶⁾.

Dermal Augmentation:

Combining hyaluronic acid-based fillers with platelet-rich plasma (PRP) has been standard practise in cosmetic dermatology for quite some time. Because of its meteoric rise in popularity, the "Vampire Facelift" has been coined to describe the combination of platelet-rich plasma and dermal fillers. There is speculation that the PRP's abundance of growth factors can help the skin rejuvenate, making it smoother and softer while also decreasing rhytids. When combined with hyaluronic acid fillers or other dermal augmentation therapies, platelet-rich plasma (PRP) can improve skin renewal and soft tissue augmentation ⁽⁶⁾. Dermal fillers combined with PRP have shown positive results in treating nasolabial folds, horizontal neck bands, skin homogeneity/tonicity, and facial rhytids, with the effects lasting for months to years. Possible considerable improvement in eye area skin tone and rhytids ⁽⁹⁾.

Augmented Fat Injections:

Researchers have found that infusing PRP during autologous fat grafting improves the success rate of the procedure. In recent years, autologous fat grafts have become increasingly popular for cosmetic procedures including dermal augmentation and facial rejuvenation because of their perceived safety and lack of potentially contagious blood-borne viruses. Pure PRP preparations (P-PRFM) have a fibrin matrix that binds and holds the growth factors inside PRP, releasing them more slowly, and so allowing the injected fat cells to survive for a longer period of time ⁽¹⁰⁾.

Striae Distensae:

Long-term skin tension causes striae distensae, which are atrophic dermal scars. Positive cosmetic outcomes were achieved by combining PRP with intradermal radiofrequency and ultrasound devices ⁽¹¹⁾. Ultrasound therapies are commonly used after radiofrequency treatments to aid in the transepidermal penetration of PRP. Patients are generally pleased with the cosmetic results, and abdominal biopsies taken after treatment demonstrate an increase in collagen density and elastic fibres ⁽¹²⁾.

PRP and Striae distensae:

PRP's alpha granule-released growth factors play a significant role in mediating tissue repair. These growth factors can be utilized therapeutically to stimulate cellular proliferation, migration, and differentiation, all of which contribute to the body's innate ability to repair. Wound-healing properties of platelet-rich plasma,

which influence endothelial cells, erythrocytes, and collagen, may contribute to the resolution of the localized chronic inflammation hypothesized to have a role in the development of SD. This synergistic treatment approach may also promote collagen neogenesis and redistribution^(11, 13).

Randomly, **Ibrahim et al.**⁽¹⁴⁾ split 68 SD patients into three groups. Three groups of patients were studied: group I (23 patients) treated with intradermal injection of PRP; group II (34 patients treated with microdermabrasion); and group III (11 patients treated with intradermal injection of PRP and microdermabrasion in the same session). A recent study found that platelet-rich plasma (PRP) alone is more successful than microdermabrasion alone in treating SD, and that the combination of the two is even more effective in the short term. After 3 months, PRP injection caused elastic fibres to grow in length and thickness, multiply, and rearrange themselves uniformly.

After 8 weeks of plasma fractional radiofrequency therapy once every two weeks for SD, patients have been given ultrasound-assisted topical PRP therapy. The average width of the widest striae decreased from 0.75 millimetres to 0.27 millimetres. Additionally, 71.9% of patients noted either good or excellent progress in the reduction of their striae distensae⁽¹²⁾.

Gamil et al.⁽¹⁵⁾ evaluated the efficacy and safety of intralesional injection of platelet-rich plasma (PRP) to that of topical tretinoin (0.05 percent) in the treatment of Striae distensae⁽¹⁴⁾.

All 30 patients participating in the study showed bilateral striae distensae. Every patient had three rounds of intralesion PRP injections, once a month, with each session treating 50% of the targeted striae. The other half used a tretinoin cream (0.05%) nightly for three months. According to the study, both platelet-rich plasma (PRP) injection and topical tretinoin (0.05%) are effective modalities for the treatment of SD, particularly striae alba; however, PRP is more effective, safe, and yields superior outcomes in the treatment of SD. The striae rubra respond better to both types of treatment than the striae alba. Platelet-rich plasma (PRP) is a potential new therapy that doesn't carry any serious side effects as infection either hyperpigmentation⁽¹⁵⁾.

CONCLUSION

New and promising in the treatment of striae distensa, platelet-rich plasma (PRP) poses no danger of hyperpigmentation or infection.

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