

CONCLUSION AND RECOMMENDATIONS

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From results of this study and in addition to reviewing related internationally published literature, we can conclude the following:

- Striae distensae is a common skin condition, do not cause any significant medical problem, but they can be of significant distress to those affected.
- In our study micro-needling with platelet rich plasma was effective and safe for treatment of striae distensae.

Recommendations:

- However this technique requires further elaboration with regard to both efficacy and data concerning adverse effects. Potential refinement of the number of sessions and treatment parameters need further evaluation to maximize the therapeutic efficacy for different indication and minimize side effects. For this reason, controlled clinical studies and longer follow up periods are needed to assess the long term efficacy.
- Histopathological evaluations should be done for understanding the mechanism of action of platelet rich plasma in striae distensae tissue.

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PROTOCOL

COMPARATIVE STUDY BETWEEN MICRONEEDLING ALONE AND COMBINED WITH PLATELET RICH PLASMA IN TREATMENT OF STRETCH MARKS

دراسة مقارنة بين استخدام الإبر الميكروسكوبية وحدها أو مع البلازما الغنية بالصفائح
لعلاج علامات شد الجلد

Protocol of a thesis submitted
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جامعة الإسكندرية

إيفاءً جزئياً

لشروط الحصول على درجة

الماجستير في الأمراض الجلدية والتناسلية و طب
الذكورة

من

دينا عادل سعد الشيخ

بكالوريوس الطب والجراحة, الإسكندرية

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قسم الأمراض الجلدية و التناسلية و طب الذكورة

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INTRODUCTION

Striae distensae (stretch marks) is a common skin condition. Though, striae do not cause any significant medical problem, they can be of significant distress to those affected. Striae represent linear dermal scars accompanied by epidermal atrophy⁽¹⁾.

Striae distensae affect skin that is subjected to continuous and progressive stretching. They occur on the abdomen and the breasts of pregnant women, on the shoulders of body builders, in adolescents undergoing their growth spurt, and in individuals who are overweight⁽²⁾.

Skin distension apparently leads to excessive mast cell degranulation with subsequent damage of collagen and elastin. Prolonged use of oral or topical corticosteroids or Cushing syndrome (increased adrenal cortical activity) leads to the development of striae. Genetic factors could certainly play a role, although this is not fully understood⁽¹⁾.

Earlier or immature stages of striae distensae, appears clinically as flattened areas of skin with a pink-red hue that may be itchy and slightly raised (striae rubra). Then and due to atrophic changes stretch marks tend to increase in length and acquire a darker purple color. Over time, they become white, flat, and depressed⁽²⁾. High-resolution epiluminescence colorimetric assessment of striae distensae, identified four distinct types: striae alba, striae rubra, striae caerulea, and striae nigra. The direct and indirect influences of melanocyte mechanobiology appear to have a prominent effect on the various colors of striae distensae⁽²⁾.

Various treatments are available for the purpose of improving the appearance of existing stretch marks, including topical preparations such as tretinoin, glycolic acid and trichloroacetic acid peels, laser treatments; UVB/UVA1 combined therapy, microdermabrasion, radiofrequency devices and micro-needling therapy alone or combined with platelet rich plasma⁽³⁾.

Microneedling therapy also known as collagen induction therapy. It has been shown that rolling with a dermaroller (192 needles, 200 micrometer length and 70um diameter) (figure 1), over an area for 15 times will result in approximately 250 holes per cm².during the treatment the needles pierce the stratum corneum and create microconduits (holes) without damaging the epidermis. Microneedling leads to the release of growth factors which stimulates the formation of new collagen (natural collagen) and elastin in the papillary dermis. In addition, new capillaries are formed. This neovascularization and neocollagenesis following treatment leads to reduction of scars. Microneedling has many uses such as restoring skin tightness in the early stages of facial aging, fine wrinkles, acne scarring, tightening skin after liposuction, stretch marks, lax skin on the arms and abdomen and scars⁽⁴⁾.

Microneedling may be used alone or combined with the use of other products which contain multiple growth factors that enhance healing such as platelet-rich plasma (PRP)⁽⁵⁾.

PRP describes any autologous blood product that has been processed to increase the concentration of platelets within a small volume of plasma, and therefore the concentration of growth factors. Both the plasma and the concentrated platelets contain fundamental growth factors that may be valuable in PRP preparations. It is used in oral surgery for bone grafts and

continues to be used in maxillofacial and plastic surgery to augment the healing of a wide range of tissues⁽⁶⁻⁷⁾.

In 2003, PRP was first reported to be used for musculoskeletal-related injuries. Many musculoskeletal injuries involve anatomic areas with minimal blood flow and a low cell turnover rate. Therefore, the number of growth factors available to enhance healing is not optimized. Platelet-rich plasma may offset this imbalance of growth factor supply and demand that typically hinders the regenerative process, thus enhancing recovery in patients who desire a rapid return to pre-injury level of function. Platelet rich plasma (PRP) contains several growth factors, including platelet-derived growth factors (PDGF), transforming growth factor-beta 1 (TGF-beta 1) at high levels and vascular endothelial growth factor (VEGF). When platelets are activated growth factors are released which emit chemical signals to surrounding areas multiplying the growth factors thus causing a heighten “immune response”⁽⁵⁻⁷⁾.

Platelet derived growth factors' main functions are to stimulate cell replication (mitogenesis) of healing capable stem cells. It also stimulates cell replication of endothelial cells. This will cause budding of new capillaries into the wound (angiogenesis), a fundamental part of all wound healing. In addition, PDGF seems to promote the migration of perivascular healing capable cells into a wound and to modulate the effects of other growth factors^(8,9).

Fibroblasts are among the cells that are activated by TGF-beta. When a fibroblast is activated it will undergo cell division and produce collagen. Collagen deposition is responsible for plumping the skin⁽¹⁰⁾.

AIM OF THE WORK

To compare between the effects of micro needling alone and its effect when combined with platelet rich plasma (PRP) in treatment of stretch marks.

PATIENTS

20 Patients who are suffering from striae distensae in abdomen and/or thighs will be selected from the out patient clinic of Dermatology and Venereology department, Main University Hospital, Alex, Egypt.

Exclusion criteria⁽¹¹⁾

11. Use of systemic retinoids or any other scar treatments procedure in the previous 3 months.
12. Presence of skin cancers, warts, solar keratosis or any skin infection.
13. Active acne in the affected area with striae distensae.
14. Patient on anticoagulant therapy.
15. Allergy to local anesthetic agents.
16. Patient on chemotherapy, radiotherapy or high doses of corticosteroids.
17. Patients with uncontrolled diabetes mellitus.
18. Patients with keloid tendency.
19. Patients with uncontrolled hypertension.
20. Patients shouldn't receive salicylates or NSAIDs at least 2 days before the procedure.

METHODS

Treatment will be performed as an office procedure. Patients' consents will be taken. Every patient will be subjected to 2 treatment sessions, with 6 weeks in between (minimal duration for new natural collagen to form)⁽⁴⁾.

At each session the striae on the right side will be treated with rolling, while the left side will be treated by microneedling associated with PRP.

Topical anaesthesia with occlusion using EMLA 5% cream (Lidocaine 25mg, Prilocaine 25 mg) Astrazeneca, Sweden will be applied to the treated area 45 minutes before the procedure⁽¹²⁾.



Fig. 1: Dermaroller⁽⁴⁾

Under highly strict antiseptic techniques, rolling will be done 15-20 times in horizontal, vertical and oblique directions. Petechial or pin point bleeding which occurs will be controlled. After treatment, the area will be wetted with saline pads.

Microneedling associated with PRP application will be done as follow⁽¹³⁻¹⁵⁾:

STEP 1: Draw venous blood, 50cc blood will be drawn from every patient, (vacuum allows 10 ml max. per tube).

STEP 2: Centrifuge at 3,500 R.P.M. x 7 minutes, until the platelets, which carry the growth factors, are separated from the remaining blood.

STEP 3: Tube plasma yield = 6 ml.

STEP 4: Remove 3ml (50%) of plasma from top of tube (Platelet Poor Plasma) if enrichment (PRP) is required = doubled platelet concentration.

STEP 5: Re-suspend platelets & WBC's in remaining 3 ml of plasma with vortex device and allow to stand for 5 minutes (growth factor release by platelets).

STEP 6: The treatment area undergoes nappage, via medical micro needle therapy below to produce microscopic channels through the epidermis in order to increase the penetration of the PRP into the dermis and to initiate the immune response in the dermal layer.

STEP 7: The activated PRP will be applied to the desired area and nappage will be continued with the roller.

STEP 8: Saline will be applied to the area for 30 minutes. To hydrate the skin and infuse the PRP into the micro channels.

The patients will be photographed and assessed clinically at the time of enrolment to grade the severity of striae. The assessment will be done by two non author (blinded) dermatologist comparing the before and after photo in non chronological order as per the grading system proposed by Goodman and Baron⁽¹⁶⁾.

The final assessment and grading of striae will be done six weeks after the last session and repeat photographs will be taken. The appearance and grading of scars will be then compared with that in the pre-treatment period⁽¹⁶⁾.

RESULTS

The results of this study will be tabulated and analyzed with the use of appropriate statistical methods and appropriate figures and diagrams.

DISCUSSION

The results will be discussed in view of achievement of the aim, their significance and their comparison with previous related researchers.

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**ARABIC
SUMMARY**

الملخص العربي

المقدمة: وتشمل التعريف بعلامات شد الجلد وهي ندبات تتكون نتيجة شد الجلد المستمر في طبقات الجلد العميقة مع فقدان ليبروتينات الكولاجين و الإيلاستين منها. كما تحتوي علي شرح تفصيلي للتركيب الدقيق للجلد وأنسجته الضامة مع شرح أسباب و كيفية تكون العلامات و طرق علاجها المختلفة مع التطور المستمر في الطرق العلاجية الخاصة به و نبذة عن الأبر الميكروسكوبية و استخداماتها و طرق العلاج بالبلازما الغنية بالصفائح .

الهدف من العمل:

المقارنة بين استخدام الإبر الميكروسكوبية وحدها أو مع البلازما الغنية بالصفائح لعلاج علامات شد الجلد

المرضى: عشرون مريضة تعاني من علامات شد الجلد أعمارهن بين 15 و 30 عاما

المنهج: كل مريضة تخضع لإجراءات متتالية تبدأ بأخذ إقرار منها بالموافقة علي الخضوع للعلاج المنوط به الدراسة، و أخذ التاريخ المرضي و الفحص الإكلينيكي الدقيق مع تقييم درجة المرض قبل تطبيق العلاج والذي يقسم المرضي الي مجموعتين، الأولى تخضع للعلاج بالإبر الميكروسكوبية وحدها في الناحية اليمنى للجسم، أما الثانية فيتم علاجها باستخدام البلازما الغنية بالصفائح مقترنة مع الإبر الميكروسكوبية في الشق الأيسر للجسم. تم تقييم النتائج باستخدام صور فوتوغرافية ألتقطت قبل بدء العلاج و بعد ثلاثة أشهر من آخر جلسة بواسطة خبراء في علم الأمراض الجلدية عن طريق استخدام تدريج يدعي كوارتيل و بالاستعانة بدرجة رضاء المريض.

النتائج: تم الحصول على بيانات من 20 مريضة بعلامات شد الجلد، المتوسط العمري لهم هو 23.6 عاما، جميعهن من الإناث، 15% منهن من نوع الجلد الثاني (حسب تقسيم فيتزباتريك)، 10% من النوع الثالث، 55% من النوع الرابع و 20% من النوع الخامس. 10% منهن يعانين من نوع شد الجلد الأبيض بينما 90% من النوع الأحمر. 40% من المرضي مصابون في منطقة البطن، و 30% في الأجناب و مثلهم في الفخذ. 55% من المرضي يعانون من العلامات لفترة تتراوح بين عام و عام و نصف، 20% أقل من عام و 25% أكثر من عام و نصف. كلا من الحمل و السمنة يتناصفان في كونهما من الأسباب الرئيسية للمشكلة. بالنسبة لنتيجة العلاج، فقد أظهرت تحسنا ضئيلا بنسبة 40% للناحية اليمنى مقارنة ب 15% للناحية اليسرى باستخدام تدريج كوارتيل، و متوسطا بنسبة 40% لليمنى و 35% لليسرى، أما التحسن الملحوظ فكان من نصيب الجانب الأيسر بنسبة 50% مقارنة ب 20% للأيمن. أما عن درجة رضاء المريض، فكان نسبة الرضا العالي 70% للناحية اليسرى، مقارنة ب 50% لليمنى، و نسبة الرضا المتوسط 20% للجانب الأيسر و 30% للأيمن، و عدم الرضا 10% للأيسر و 20% للأيمن. بالنسبة للمضاعفات، فقد عاني كل المرضي من الألم باختلاف درجاته، إمرار الجلد و النزف مكان بثور الأبر الميكروسكوبية، لكن 30% منهن فقط عانين من التقشر للجلد .

المناقشة: تمت مقارنة النتائج بنتائج ثلاث دراسات كورية و أخرى مصرية، جميعها تشترك مع الدراسة الجارية سواء في استخدام البلازما الغنية بالصفائح أو الأبر الميكروسكوبية.

الملخص: و فيه إجمال لكل النتائج السالف ذكرها.

التوصيات: ببعض النصائح الواجب اتباعها لتأكيد إضافة البلازما الغنية بالصفائح للعلاج بالأبر الميكروسكوبية و هي:

إطالة فترة متابعة المرضي في دراسات إكلينيكية تحت السيطرة لضبط عدد الجلسات، الفوائد العلاجية للإستخدامات المختلفة و مضاعفات تطبيق التقنية.

التقييم باستخدام عينة ميكروسكوبية من الجلد لتحديد آلية عمل البلازما الغنية بالصفائح في حالات علامات شد

الجلد

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الملخص العربي

دراسة مقارنة بين استخدام الإبر الميكروسكوبية وحدها أو مع البلازما الغنية بالصفائح
لعلاج علامات شد الجلد

رسالة علمية

مقدمة لكلية الطب – جامعة الإسكندرية
إيفاءً جزئياً لشروط للحصول على درجة

الماجستير في الأمراض الجلدية والتناسلية و طب الذكورة

مقدمة من

دينا عادل سعد الشيخ

بكالوريوس الطب والجراحة – جامعة الإسكندرية

كلية الطب
جامعة الإسكندرية

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