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Comment and Controversy
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Platelet-rich plasma for facial rejuvenation: An early examination

Abstract Platelet-rich plasma (PRP) has become a popular and trendy treatment in dermatology for various skin ailments, most notably for acne scars, traumatic scars, hair regrowth, and cutaneous rejuvenation. Although PRP has been utilized in the world of orthopedics for many years, its recent entry into dermatology has been wrought with controversy, especially as some have marketed it to consumers as a type of cure-all; however, the studies behind PRP treatment, especially for cutaneous rejuvenation, are currently limited, while we await additional larger studies. Clinicians should have an understanding of the evidence behind such new trends, especially in the fast-pace world of esthetics.

Introduction

Cutaneous aging results from a combination of intrinsic aging and environmental factors, including ultraviolet radiation, inflammation, chemical exposures, and reactive oxidative species.[1,2] Clinically, this can lead to skin laxity, fine lines and wrinkles, and epidermal thinning. On the cellular level, an accumulation of DNA damage harms cellular function, protein maturation, and normal physiology.[1,2] Ultraviolet radiation, in particular, contributes to reactive oxidative species, which can degrade the extracellular matrix and lead to clinical signs of aging. Additionally, some of the biggest factors contributing to skin aging are the decreased production of collagen and fibroblasts.[3] Although growth factors and cytokines in the skin stimulate cell turnover, an effective antiaging treatment may theoretically involve their stimulation in the skin. It is theorized that platelet-rich plasma (PRP), which is a source of numerous growth factors, cytokines, and other biologically active molecules, could be used in cutaneous rejuvenation. The available studies in the literature are currently limited and marked with anecdotal experiences, which continue to fuel their controversial status in dermatology, especially when concerning esthetics.

Platelet-rich plasma

PRP is an autologous derived blood product that contains an increased concentration of platelets isolated from whole blood by centrifugation. The centrifuge both separates the PRP from the red blood cells and concentrates platelets to be three to seven times greater than unaltered plasma.[4,5] The concentration may vary due to differences in preparation methods and blood consistency at the time of collection. PRP also contains chemokines, cytokines, and growth factors, which can help to accelerate proliferation and regeneration of tissue.[5]

The rationale for using PRP is its supratherapeutic level of stimulatory factors and platelets. Platelets store and release growth factors, including platelet-derived growth factor, vascular endothelial growth factor, and transforming growth factor beta.[4] These growth signals and proteins are able to stimulate cellular proliferation, differentiation, and regeneration including activating fibroblasts and synthesizing collagen.[6] As a result, PRP has become an attractive option for cutaneous rejuvenation.

PRP for cutaneous rejuvenation

With aging, the skin loses some of its ability to repair and regenerate. Because PRP contains important growth factors for healing, it has been studied for cutaneous rejuvenation. Studies have evaluated the use of topical and intradermal PRP used alone and in conjunction with resurfacing treatments.

In one study, 12 women underwent three monthly treatments of intradermal PRP to the forehead, crow's feet areas,

cheeks, and nasolabial folds.[7] The efficacy, as defined by reduction in wrinkles, increased smoothness, and increased hydration, was measured at 1 month after the final treatment. The results were analyzed subjectively through investigator and patient evaluation as well as objectively through imaging software and intradermal water loss measurement. At followup, 75% of clinicians and 62.5% of patients rated the response as either good or sufficient using a clinical rating scale. All patients completed the study and side effects included temporary burning, mild erythema, and bruising at the injection site. Imaging software showed overall improvement in wrinkle reduction, texture, and tone. Hydration was also improved as measured by barrier function and skin capacitance.

A recent split-face trial evaluated the effects of a 3-mL single injection of PRP on photoaged facial skin compared with saline control in 19 men and women with bilateral cheek rhytides.[8] Mean photoaging scores at 6 months after treatment rated by two dermatologists showed no significant differences between the PRP- and saline-treated sides for fine lines, mottled pigmentation, roughness, and sallowness; however, participant satisfaction with texture, wrinkles, pigmentation, and telangiectasias was greater for the PRP-treated side at 6-month followup.

Another study was conducted with ten patients, where PRP was applied to an individual's forehead, malar areas, and jaw using a dermaroller with additional PRP injected directly into the crow's feet areas.[9] After application, the whole face was draped with PRP-soaked gauze for 30 minutes. The protocol was repeated three times at 2-week intervals. Results were evaluated by three dermatologists and patient self-assessment before and after PRP administration. Patients reported improvements in general appearance, skin firmness-sagging, and wrinkle state, but found no difference in pigmentation. The only significant difference noted by clinicians was in the skin firmness-sagging measures.

In an additional study, 22 women had three sessions of nonablative fractional laser, and half were randomized to receive PRP in conjunction with laser therapy, whereas the other half received laser therapy alone.[10] PRP was applied topically and occluded for 20 minutes after each session. Results were evaluated 1 month after the final treatment on the basis of subjective patient satisfaction scores, photographic review by two blinded dermatologists, skin capacitance, elasticity, surface roughness, and erythema index. At the study's end, 100% of the patients who received combination therapy reported improvement in skin texture or fine wrinkles compared with only 58% who received laser therapy alone. Using objective dermatologist evaluation, 73% of participants in the combination group showed improvement compared with 45% receiving laser monotherapy; however, these differences were not statistically significant. Skin roughness and elasticity were significantly improved in the group receiving PRP. No differences were seen in skin capacitance, and there was no significant difference in duration of posttreatment erythema.

Conclusions

Current data on the use of PRP in esthetic dermatology are limited.[11,12] Only small trials have been conducted, and most are not randomized controlled trials. Methods of PRP preparation and application also vary among studies, which makes it difficult to make evidence-based recommendations on protocols to optimize the efficacy of PRP in cutaneous rejuvenation.

Despite limitations in the available data, there is some early evidence to suggest that PRP may be useful for rejuvenation, especially when combined with other treatment modalities. PRP appears to offer advantages, such as decreased downtime and erythema, when combined with laser and microneedling therapies. Additionally, patients have noticed differences when using PRP. There were no long-term side effects reported in any study, and the only short-term side effects observed were related to the intradermal route of administration.

Although it may be too early to make any definitive conclusions, it appears that PRP may offer benefits for cutaneous rejuvenation with little risk for side effects. Larger randomized controlled trials are still needed to further evaluate these benefits.

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