THERAPEUTIC UPDATE

Therapeutic Update on the Treatment of Striae Distensae

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The precise etiology of striae distensae (SD) remains to be elucidated. Obesity and rapid weight gain or weight loss have been shown to be associated with the formation of SD.[1] While many believe that mechanical stretching of connective tissue, causing it to rupture, is the main cause, others suggest that normal growth, associated with high serum levels of steroid hormones may be the cause.[2] Elevated serum levels of steroid hormones have a catabolic effect on the fibroblast activity, causing a decrease in deposits of collagen in the substance of the dermal matrix. High risk groups include adolescents and pregnant women who experience a rapid increase in size of particular regions of the body. SD are two and a half times more frequent in women, compared to men. In boys, the outer aspects of the thighs and the lumbosacral region are the most common sites; in girls, the thighs, upper arms, buttocks and breasts are the most common.[3]

Early SD are pinkish red, so-called striae rubra (SR), and may be slightly raised. They typically become darker purple in color, but eventually become white and slightly atrophic, so-called striae alba (SA). Histologically, SD are indistinguishable from scars. Collagen bands in the upper reticular dermis are stretched and are aligned parallel to the surface of the skin. There is overall loss of collagen and elastin, with flattening of the rete ridges.[4]

SD are most likely to respond to therapy in the earliest stages (SR). Once they become mature and whitened (SA), they are very difficult to eradicate. Treatment consists of various topical therapies, as well as lasers and light devices, RF devices, microdermabrasion and needling.

Topical Therapy

Tretinoin has been shown to clinically improve the appearance of early SR without much effect on mature SA. In one study, 22 patients applied 0.1% tretinoin (n=10) or a placebo (n=12) daily for 6 months. Targeted striae in the group treated with tretinoin decreased in mean length by 14%; and mean width by 8%, compared with an increase of 10% and 24% in mean length and width, respectively, in patients who received the placebo.[5] In another study, Rangel et al treated pregnancy-related striae of the abdomen in 20 women post-partum. After 0.1% tretinoin cream was applied daily for 3 months, target lesions decreased by 20%.[6]

Use of other retinoids, such as tazarotene or adapalene also may be useful. However, no topical retinoid should be used in pregnant or breast-feeding females due to possible absorption and teratogenic effects.[7]

While there are no well-controlled published studies, glycolic acid, an AHA, has been known to stimulate collagen production by fibroblasts and it has been used with varying degrees of success in treating striae.[8]

Trichloroacetic acid (TCA 10-35%) has also been used to treat striae. While there is a lack of published data, many anecdotal results reveal improvement in color and texture of striae when a low concentration of TCA is applied at monthly intervals.[9]

Microdermabrasion

Microdermabrasion has been used to treat acne scars, fine wrinkles and mottled pigmentation.[10] Applied to the stratum corneum, microdermabrasion appears to induce epidermal signal transduction pathways that set in motion a cascade of molecular events, capable of causing remodeling and repair.[11] In an Egyptian study, 20 patients with SD received 5 microdermabrasion treatments at weekly intervals on half the body; the SD on the other half of the body served as a control. There was an overall good-to-excellent response in over half the subjects; upregulation of type I precollagen MRNA was found in all treated SD samples.[12] Improvement was greater in lesions of SR than SA.

Lasers and Light Devices

The 585nm flashlamp pulsed dye laser (PDL) at low energy densities is commonly used to target the dilated blood vessels of SR. A series of treatments at 4-to-6-week intervals has been purported to increase the amount of collagen in the extracellular matrix.[13,14] The PDL has a moderate, beneficial effect in reducing the degree of erythema in SR, but no apparent benefit in SA. Because of the potential for adverse effects, PDL should be performed with extreme caution or not at all in Fitzpatrick V-VI patients.

Intense pulsed light (IPL), characterized by a noncoherent filtered flashlamp with a broadband spectrum (515-1200nm) has been shown to replace dermal elastosis with neocollagen, thus improving the appearance of mature SD after a series of treatments.

The long-pulse 1064 Nd:YAG, used for non-ablative treatment of facial wrinkles, has been shown to increase dermal collagen. It also has a strong affinity to vascular targets, making it a useful modality in the treatment of SR. In a published study using the long-pulse 1064 Nd:YAG on immature SD in 20 patients, investigators and patients identified the results as satisfactory.[15] The 1064 Nd:YAG laser can be safely used, even in patients with dark skin types.

Non-ablative fractional photothermolysis using the 1550nm laser useful in treating hypopigmented scars, has also proved beneficial in the treatment of mature SD. In a 2007 Brazilian study, the Fraxel improved texture and appearance of mature SD in Fitzpatrick skin types I-IV.[16]

Ablative fractional lasers, such as the fractional CO_2, were found to give unpredictable results in one study, where some patients demonstrated significant improvement, while others showed little change from baseline.[17] Other investigators have found benefit in using fractional CO_2 laser resurfacing for treatment of SA.[18,19] Fractional CO_2 lasers combined with fractional microneedle radiofrequency has been shown to be safe and effective in the treatment of SD.[20]

The 308-nm xenon-chloride excimer laser (XeCl) used in psoriasis, vitiligo and post-inflammatory hypopigmentation, has been used to repigment SA. Published studies have documented temporary repigmentation and improvement of leukoderma. Post-treatment biopsies showed increased melanin pigment, hypertrophy and increased number of melanocytes, however failed to demonstrate any improvement in skin atrophy.[21,22]

Conclusion

SD are a common cosmetic concern that affect a majority of the population. At this time, treatment to diminish the erythema of SR seems to be more effective than treatment to ameliorate mature SA. More research, clinical trials, and combination therapy should be encouraged to develop safe and effective treatment protocols.

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