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Intralesional Therapy for Localized Plaque Psoriasis

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Abstract:

Localized plaque psoriasis is a chronic inflammatory skin disorder characterized by well-demarcated, erythematous plaques with silvery scales. When lesions are limited in number and resistant to topical therapy, intralesional therapy offers a targeted treatment option that delivers medication directly into the affected skin, maximizing local efficacy while minimizing systemic side effects. Intralesional corticosteroids, particularly triamcinolone acetonide, are the most commonly used agents in this approach. They exert anti-inflammatory, immunosuppressive, and antiproliferative effects, leading to reduction of erythema, scaling, and plaque thickness. The therapy is typically administered through multiple small injections into the dermis of psoriatic plaques at intervals of several weeks. Intralesional treatment is especially beneficial for persistent plaques on areas such as the scalp, elbows, knees, and nails. Clinical studies have demonstrated that intralesional therapy can significantly improve localized lesions, particularly those refractory to conventional topical treatments. However, potential adverse effects include skin atrophy, hypopigmentation, telangiectasia, and pain at the injection site, which necessitate careful dosing and technique. In conclusion, intralesional therapy represents an effective and localized treatment modality for patients with limited plaque psoriasis. With proper patient selection and administration, it can provide rapid improvement while reducing the need for systemic therapy. Further research is recommended to optimize dosing regimens and explore additional intralesional agents for enhanced therapeutic outcomes.

Introduction:

Psoriasis is an inflammatory disease in which both innate and adaptive immune systems have been implicated in its immune pathology. The cytokine members in the interleukin IL 23/IL-17 axis have been shown to be critical to the pathogenesis of psoriasis and therapeutics targeting major cytokines in this axis have proven to be highly effective in managing the disease **(1-2)**.

Consequently, the immunopathology of psoriasis has focused largely on IL-23/IL-17 cytokines and T cells **(3)**. However, neutrophils are increasingly considered a major cell source of IL-17 in psoriasis **(4)**, through the release of neutrophil extracellular traps (NETs) during NETosis **(5)**.

NETosis, which is increased in psoriasis **(6)**, has been shown to induce IL-17 secretions in neutrophils and mast cells **(7)**. One of the major inducers of NETosis is activated complements **(8)**. Complements constitute a major first line of immune defense and are pivotal in the psoriatic immunology **(9)**. Activated complement components such as the highly chemotactic C3a, C5a and C5b9 were found to be elevated in psoriatic plaque relative to non-psoriatic scale **(10)**.

The activated complement components are highly chemotactic and probably induced neutrophil migration into the stratum corneum to form Munro microabscesses, a characteristic of psoriasis plaques **(11)**.Therefore, complement activation of neutrophils could be an early event in psoriatic pathology leading to enhanced NETosis and IL-17 secretion and preceding the activation of IL-17/IL-23 axis in psoriatic immune pathology **(12)**.

Intralesional therapy for localized plaque psoriasis:

1-Corticosteroids

Intralesional injection of steroids is indicated in limited areas of plaque-type psoriasis, palmoplantar psoriasis (PPP), and psoriatic nails **(13)**.

Richards, (2010) (14) reported significant effectiveness of triamcinolone acetonide (TAC) when used at 2.5 mg/ml in small plaques of psoriasis on the trunk and limbs with a dosage ranging from 3 to 8 ml (7.5–20 mg) given every 3–4 weeks. TAC (5 mg/mL) injections are effective in nail psoriasis and associated with minimal adverse effects **(15)**.

2-Methotrexate

Intralesional MTX (25 mg/ml) at a dosage of 0.1 ml/cm2 in the treatment of localized plaque psoriasis is an effective therapeutic modality with no significant side effects **(16)**.

For nail psoriasis, the treatment with methotrexate consisted of the infiltration of 0.1 ml (2.5 mg) per affected nail, every 30 days, for 3 consecutive months. As the applications occurred at the level of the proximal nail fold, in the case of the hallux, the dose was divided with an interval of 1cm. No anesthetic nerve block was performed and patients reported pain. After the third infiltration, the patients demonstrated an evident improvement. Five months after the first application, they still presented a good evolution **(17)**.

3-Cyclosporine

Although systemic cyclosporine is a very effective agent for psoriasis, its use is associated with hypertension and impaired renal function. For chronic plaque psoriasis, intralesional cyclosporine injection could work well without severe side effects. Cyclosporine exerts its local effects by adjusting the number of CD4+ T cells, CD8+ T cells, and DCs **(13)**.

4-Botulinum toxin type-A

Intralesional Botulinum toxin type –A (BoNTA) has been used in managing intertriginous psoriasis by reducing local sweating, skin maceration, and secondary infection. In 13 of 15 patients (87%) with psoriasis who receive intradermal BoNTA injection, there is subjective improvement in erythema extension, intensity, and infiltration **(13)**.

5-15-Hydroxyeicosatetraenoic acid

Psoriatic skin lesions are characterized by elevated levels of 5- and 12-lipoxygenase products which can stimulate epidermal proliferation and induce skin inflammation. 15-Hydroxyeicosatetraenoic acid (15-HETE) has the potential to inhibit the activity of 5- and 12-lipoxygenases. A study in 13 patients has revealed that psoriatic plaques injected with 10 mmol/L 15-HETE have cleared completely in four patients and improved considerably in seven. No similar effects are found for 1 mmol/L 15-HETE and normal saline. The results imply that 15-HETE can improve psoriasis by a dose dependent mechanism **(13)**.

6-Intralesional 5-Fluorouracil for psoriasis

Five-Fluorouracil (5-FU) can block the synthesis of the pyrimidine required for DNA replication **(18)**. For chronic plaque psoriasis patients, intralesional administration of 5-FU (50 mg/ml) is locally effective, safe, low-cost, and can be tolerated well **(13)**.

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