COMMENTARY

The Enigma of Intramuscular Triamcinolone and Its Versatility as a Safe and Effective Dermatologic Therapy

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Intramuscular triamcinolone acetonide (IMT) has been used for the past 60 years, but a recent survey of 800 dermatologists showed that 55% use it rarely or not at all, primarily because of fear of adverse events. With a unique mechanism of action vs. other systemic corticosteroids, a relatively low dose, and short half-life, IMT can produce a long-term clinical anti-inflammtatory effect. This paper presents an argument for the efficacy of IMT with proper, safe use. In addition, this paper will discuss many of the clinical conditions for which IMT can be effective.
KEYWORDS: Intramuscular triamcinolone, mode of action, systemic corticosteroids

Intramuscular triamcinolone acetonide (IMT) has been used to treat dermatologic conditions for more than 60 years. However, a recent survey by the University of Utah Department of Dermatology of more than 800 United States dermatologists found that although 55% of respondents felt comfortable using IMT, more than 90% felt more comfortable using oral corticosteroids rather than IMT.[1]

A potential cause for reluctant IMT use is the adverse events from using systemic corticosteroids for treating chronic dermatologic conditions. That argument is at least partially rebutted by Shahinfar and Maibach[2] in the journal *Clinical Pharmacokinetics*:

> The enigma of the purported efficacy of triamcinolone acetonide may lie in the fact that it has a unique nature of having a long-term effect on dermatologic disease using a seemingly low dose compared with other routes of administration and other corticosteroids.[2]

Over the past two decades, there has been a paradigm shift with the introduction of new systemic medications for the treatment of psoriasis and atopic dermatitis, which can effectively treat many of the same dermatologic conditions for which IMT has been successfully used. However, there is an important practical consideration: the financial difference between these treatment modalities, let alone the difficulty of obtaining insurance coverage for newer medications. Whether finances are through insurance companies, pharmaceutical assistance programs, or out-of-pocket costs paid by patients, physicians have an ethical obligation to at least consider cost in choosing between two therapeutic options with similar effectiveness and safety features.

One of the coauthors (Robins) of this article has used IMT in his practice for more than 50 years, has written two papers on the subject,[3,4] and has treated thousands of patients with this medication safely and effectively. While most of the clinical discussion and recommendations herein will be based on his experience, it will also reflect the experiences of other dermatologists who continue to use IMT regularly.

METHODS

IMT is indicated in adults with chronic, recalcitrant, steroid-responsive dermatologic conditions inadequately treated with topical medication alone.

The typical dosing of IMT is 80mg, administered at least 7 to 8 weeks apart, and gradually tapered depending on clinical response. Injection is given into the upper outer quadrant of the gluteal muscle with a 3-cc syringe and a 1.5-inch needle. Leakage of triamcinolone into the subcutaneous tissue must be avoided to prevent localized tissue atrophy or abscess formation. We have not used IMT for children younger than 16 years to avoid any effect on bone growth. We do use IMT to treat patients with diabetes, and we counsel them that their glucose levels may increase 10 to 15mg/dL for 5 to 10 days before reverting to pretreatment levels. This reflects IMT's low dose and short half-life.

CLINICAL CONDITIONS

Pruritus. Pruritus is a component of many dermatologic conditions, but chronic pruritus of unknown origin (CPUO) affects many of our patients and can seriously impair quality of life. It can be localized (ie, lichen simplex chronicus) or more generalized (ie, prurigo nodularis or widespread excoriations). These patients will not respond adequately to topical therapy. In our experience, most patients with localized pruritus will respond to one or two IMT injections at least eight weeks apart. Patients with more generalized pruritus may require long-term treatment with IMT, administered eight to ten

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weeks apart, and are able to maintain a much-improved quality of life.

Psoriasis. In the past two decades, new systemic medications have been introduced that can safely and effectively treat moderate-to-severe psoriasis, but nevertheless, IMT can still play a positive role in the treatment of psoriasis. For example, localized psoriasis limited to the hands, feet, fingernails, scalp, genital area, or intertriginous areas can have a negative effect on quality of life but can benefit from IMT without requiring other systemic therapies. In addition, patients with psoriasis will often have significant pain and pruritus, and IMT can be helpful for those patients whose systemic therapy may inadequately control those symptoms even if their skin clears.

Atopic dermatitis/eczema. Differentiating classic atopic dermatitis from adult-onset chronic eczematous dermatitis can be difficult. Either diagnosis responds well to corticosteroids. IMT can be used initially with localized disease, though it can be used for widespread involvement. In the most severe cases that do not respond to IMT, other systemic medications (eg, dupilumab, Janus kinase [JAK] inhibitors) can be used.

Lichen planus. Lichen planus has many different clinical manifestations but almost always responds to corticosteroids. It occurs as either a localized or more widespread cutaneous eruption, and if it is chronic and inadequately treated with topical therapy alone, then IMT is an effective therapy. Oral lichen planus is painful, symptomatic, and often long-term, but it responds well to IMT. Lichen planopilaris, as well as frontal fibrosing alopecia, can occur acutely and lead to permanent scarring hair loss. In that situation, it would best be treated with oral corticosteroids and other immunosuppressive medications. However, it can be indolent and slowly progressive; in these cases, IMT should elicit a positive response.

Scarring alopecia. Lichen planopilaris and frontal fibrosing alopecia were previously discussed under the lichen planus section. The most common scarring alopecia is central centrifugal cicatricial alopecia (CCCA), which is most often seen in Black women in their 20s to 50s, though occasionally it may be seen in older age groups. Once IMT treatment is initiated, the progression of hair loss can be stopped and a little regrowth may be seen, as some of the hair falls out prior to the follicles becoming completely scarred. Once the condition stabilizes, the injections can be tapered slowly while following the patients with serial photography.

Alopecia areata (AA). AA is steroid responsive and, when localized on the scalp, responds to intralesional corticosteroids. When AA involves the beard area of the face and neck, sites where intralesional injections can be problematic, one or two IMT injections can be effective in stimulating hair regrowth. AA often involves large areas of the scalp where intralesional corticosteroids can be painful; in those situations, IMT is effective and can also prevent progression of the condition.

Hand and foot dermatitis. Chronic dermatitis limited to the hands and/or feet is sometimes categorized as either psoriasiform (hyperkeratotic or pustular) or eczematous based on clinical observation. Therapeutically, it is almost always difficult to treat with topical medication alone. In our experience, IMT effectively induces a long-term remission, and patients may only require one or two injections over the course of a year.

Miscellaneous conditions for which IMT has been effective.

- Chronic mild-to-moderate urticaria
- Generalized granuloma annulare
- Small plaque parapsoriasis
- Pityriasis lichenoides et varioliformis acuta (PLEVA)
- Pityriasis lichenoides chronica

Safety. While IMT has a good safety profile, there are some adverse events to know. These include localized lipoatrophy of a sterile abscess following an injection, petechiae and purpura (especially in older patients with actinic damage), mild hyperglycemia, menstrual irregularities, and, rarely, mild hirsutism.

Oral corticosteroids present numerous adverse effects not seen with IMT. Adverse reactions to oral corticosteroids include psychiatric symptoms, muscle weakness, weight gain, increased appetite, fluid retention, moon face, insomnia, hyperactivity, increased centripetal fat distribution, gastrointestinal issues (eg, nausea and bloating), cataracts, and hypertension.

One of the concerns with the long-term use of corticosteroids is aseptic necrosis of the femur or other bones; however, in the author's experience, when using IMT as described in this paper, it is an extremely rare side effect. In addition, osteoporosis and fracture are other concerns with chronic corticosteroid use, but the medical literature supports the view that higher daily doses as well as total cumulative doses of corticosteroids are related to a higher risk such adverse events.[5,6] The low cumulative dose of steroid as well as the episodic administration of IMT lessens the possibility of adverse effects.

Reddy et al[6] explored the extent of adrenal suppression of IMT in 14 patients with steroid-responsive dermatologic diseases who received either one or two doses of IMT 6 weeks apart. Although the mean total cortisol was significantly decreased at 6 and 12 weeks compared with baseline, IMT did not result in iatrogenic Cushing syndrome or secondary adrenal insufficiency in any patient. Mean Physician and Subject Global Assessment of Disease Activity Scale scores were significantly improved at 6 and 12 weeks compared with baseline.[7]

One of the most important studies in the literature that helps explain the metabolism and overall safety of IMT is by Kusama et al,[7] who treated 5 patients with radioactively tagged triamcinolone acetonide and measured the plasma levels and urinary excretion. They found that the peak plasma levels of triamcinolone acetonide occurred in the first one or two days, then fell rapidly over the next 6 to 7 days to about one-third of the peak level. This period was thought to represent an equilibrium between the slow release from the muscle deposit and the slow excretion because of triamcinolone's low renal clearance rate. During the next week, the plasma level decreased steadily and was gone by the end of the third week, with a subsequent 4 to 5-week break before another injection.[8] The fact that the anti-inflammatory effects of IMT remain effective long after the medication has been metabolized by the body helps explain the safety of IMT if used as described in this paper.

CONCLUSION

The authors describe the unique mode of action of IMT, including a low medication dose, a short half-life, and a long clinical response. These factors help explain its overall safety when used as described in this paper and instill confidence in prescribers. In addition, the many clinical conditions for which IMT can be used effectively make it an extremely versatile option for dermatologists. Furthermore, it is cost-effective compared to other systemic medications, another positive benefit in our current medical economic environment.

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