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Review Article

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A REVIEW ON COMPARATIVE STUDY OF TACROLIMUS VERSUS CORTICOSTEROIDS IN THE TREATMENT OF ATOPIC DERMATITIS

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ABSTRACT

In the recent years, the need for multifaceted treatment approach to treat atopic dermatitis which affects about 20% of the population worldwide has become a matter of utmost importance. Various studies have been conducted to clearly understand the effectiveness of topical calcineurin inhibitors like Tacrolimus and topical corticosteroids. The main focus of this article is to understand the efficacy of topical tacrolimus over topical corticosteroids.

INTRODUCTION

Atopic dermatitis (AD) is an inflammatory skin disease that characterised by extreme pruritus and deontic scratching. This induces population excoriation, bleeding, oozing and crusting secondary infection and ultimately, thickening lichenification.[1-4] It is a chronic disease with remission and period flare ups.

About 80% of patient experience onset when they are younger than 5 years.

While ectopic dermatitis is a childhood disease it will progresses in to adulthood disease. It was estimated that about 60% childhood cases resolved by early adolescence but dry and irritable skin result in persistence of disease.

Atopic dermatitis can occur on any part of the body, the typically affected locations vary with age.

- Infants: extensor surface, cheeks and scalps are mainly affected.
- Childhood: see mainly around the front of the elbow area, base of knee, in side of the wrist and ankles and around the neck.
- Adult: similar to childhood AD but more localized and lichenised. The buttock and hands are frequently affected.

DIAGNOSIS

The atopic dermatitis mainly based on clinical features because there are no laboratory markers or definitive test for this condition. The first criterion was published on 1980 by Hanifin and Rajka (Hanifin and Rajka criterion)[14] having signs and symptoms of four major and 20 minor criteria's. However there is a layout standardization around the variation at the above criteria are applied by different authorities.

Commonly used diagnostic criteria for atopic dermatitis.

1) Pruritis
2) Typical morphological and distributor

a. Eczematous dermatitis

- Acute lesions-erythema, exudation, papules, vesiculo-papules scales and crusts.
- Chronic lesion-infiltrated erythema, lichenification, pruritic scales.

b. Distribution

- Symmetrical Predicate: head, perioral areas, lips, periarticular area, neck, joints of limp trunk
- Age related characteristics

- Infant phase: starts on the scalp and face often spread to the trunk and extremities.
- Childhood phase: neck, the flexural surface of the Aram and legs
- Adolescent and adults phase : tendency to severe on the upper half of body (face neck ,anterior chest and back)

3) Chronic or chronically relapsing course (naturally co-existence of old and new lesion)

- More than 2 month of infancy
- More than 6 month in childhood adolescence and adulthood

DIAGNOSTIC AID

- Family history with bronchial asthma, allergic rhinitis.
- Complication of bronchial asthma and rhinitis
- Follicular papules.

SIGNIFICANT COMPLIANCE

- Ocular complications such as cataract or retinal detachment
- Kaposi's varicella form eruption

- Mollusca contagiosum
- Impetigo contagiosum

TREATMENT

Tacrolimus inhibits T-lymphocyte activation by first binding to an intracellular protein, FKBP-12. A complex of tacrolimus-FKBP-12, calcium, calmodulin, and calcineurin is then formed and the phosphatase activity of calcineurin is inhibited. This effect has been shown to prevent the dephosphorylation and translocation of nuclear factor of activated T-cells (NF-AT), a nuclear component thought to initiate gene transcription for the formation of lymphokines (such as interleukin-2, gamma interferon). Tacrolimus also inhibits the transcription for genes which encode IL-3, IL-4, IL-5, GM-CSF, and TNF-α, all of which are involved in the early stages of T-cell activation. Additionally, tacrolimus has been shown to inhibit the release of pre-formed mediators from skin mast cells and basophils, and to down regulate the expression of FcεRI on Langerhans cells.[5]

Examples of low potency tropical steroids include fluocinolone (0.01%), hydrocortisone butyrate (0.1%) and hydrocortisone (1%), (2.5%). These agents are the safest for long term use, for application over large surface areas, for use on the face or areas of the body with thinner skin and for use in children. Chronic application of topical corticosteroids may result in tolerance and tachyphylaxis.

One study which included patients of eyelid dermatitis when treated with topical calcineurin inhibitor Tacrolimus on a twice daily dosing schedule up to 8 weeks showed significant improvement in the patients thereby proving the efficacy of tacrolimus[6] while on the other hand topical corticosteroids when used in or around eyes has been associated with development of glaucoma and cataracts as well as with local cutaneous side effects, such as atrophy and telangiectasia.

A second study in adults showed an increasing percentage of patients categorized as having marked improvement or clearance over a 1-year period.[7] Patients applied 0.1% tacrolimus ointment until 7 days after improvement of the lesions and then restarted therapy whenever new lesions occurred. Although the percentage of patients in those categories after the first few weeks of treatment was no different from that for the short-term trials, a steadily increasing number of patients reached those categories on longer follow-up (54%,81%,and 86% of patients at week 1, month 6, and month 12, respectively). The rebound effect usually seen after topical corticosteroid withdrawal was not seen after tacrolimus therapy was stopped.

A third long-term US paediatric safety study showed no indication that the effectiveness of tacrolimus ointment decreases over time.[8]

A clinical study conducted with healthy human volunteers found no evidence of photo toxicity when tacrolimus ointment was used at concentrations of up to 0.3%.[9]

The incidence rates for other potential side effects, such as skin infections (in particular, viral infections, including herpes simplex and molluscum contagiosum), have not proved to be higher than in the general AD population, and there is no reason to expect the picture here to change. Indeed, reduced levels of staphylococcal colonization have been reported[10] with prolonged treatment.

According to current treatment guidelines, low-to-mid potency TCS should be used as first-line, short-term treatment of flares.[11, 12, 13]

CONCLUSION

From all the studies that has been conducted on comparative study of tacrolimus and corticosteroids in atopic dermatitis, we conclude that tacrolimus is more effective than corticosteroids. Further studies are being conducted which will define the role of various agents which will open up new avenues in the paths of treatment.

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