Topical treatment of psoriasis

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Importance of the field: The majority of patients with psoriasis can be safely and effectively treated with topical therapy alone, either under the supervision of a family physician or dermatologist. For those requiring systemic agents, topical therapies can provide additional benefit. Optimal use of topical therapy requires an awareness of the range and efficacy of all products.

Areas covered in this review: The review covers the efficacy and role of topical therapies including emollients, corticosteroids, vitamin D analogs, calcineurin inhibitors, dithranol, coal tar, retinoids, keratolyics and combination therapy. The report was prepared following a PubMed and Embase literature search up to April 2010.

What the reader will gain: The paper provides a broad review of the relevant topical therapeutic options available in routine clinical practice for the management of psoriasis and a recommendation for selection of treatment.

Take home message: Topical therapies used appropriately provide a safe and effective option for the management of psoriasis. An awareness of the available products and their efficacy is key to treatment selection and patient satisfaction.

Keywords: psoriasis, severity, topical therapy, treatment


1. Introduction

Psoriasis is a chronic, immune-mediated, inflammatory disease of the skin which affects between 1.5 and 3% of the population in Northern Europe and Scandinavia (1). Psoriasis may present at any age, although a clear subgroup develop disease before the age of 40 years (type I or early-onset psoriasis), accounting for >75% of patients (2).

Approximately 80% of patients who suffer from psoriasis have mild disease (3). Whilst physical disability may be slight, the psychological impact of their psoriasis may be significant, particularly when the hands, face or genital area are affected. Psoriasis is associated with a greater incidence of depression and suicidal ideation (4,5), and the burden of psoriasis is reported to be comparable to other chronic diseases such as diabetes and heart disease (6).

Topical therapy remains a key component of the management of all patients with psoriasis. Mild disease is typically managed with topical therapy alone and accounts of the majority of patients. Moderate to severe psoriasis is usually treated with phototherapy, systemic therapies or biological agents. However, use of topical therapy in moderate to severe disease may be helpful and can potentially reduce the amount of phototherapy or systemic agent required to achieve satisfactory disease control.

The aim of therapy is to minimize the extent and severity of psoriasis to the point at which it is no longer detrimental to a patient’s quality of life. Treatment choice should be guided by the expectations and needs of each individual patient. When employed under these circumstances a topical treatment regimen is more likely to produce a satisfactory clinical outcome than one whereby patients have been excluded from the decision-making process.
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The importance of the psychological impact of psoriasis is increasingly recognized and several assessment tools have been devised to provide an integrated measure of disease burden. This includes the Salford Psoriasis Index, which provides a three-figure assessment of past severity based on treatment history, current clinical severity and psychosocial disability [13].

2. Treatment

Despite the above limitations in quantifying disease, it is generally accepted that psoriasis affecting < 5% body surface area (BSA) is amenable to topical therapy [12]. However, this can only be seen as a guide and should be interpreted on a case-by-case basis in light of the patient’s disease burden and the patient’s expectations. A highly motivated individual may wish to use exclusively topical therapy despite widespread disease. This contrasts with others, who may wish to explore the use of systemic therapy for significantly less extensive cutaneous involvement in which the psychological burden is significant.

Topical therapy is safe and effective when used appropriately and has the benefit of limited systemic effects. When prescribing a topical therapy one must consider several factors, including patient motivation and understanding, vehicle of medicament, volume of treatment required and need for dressings.

2.1 Education

Ensuring that patients understand how to apply their treatment is central to optimizing compliance with topical therapy. Patients must be willing to use the chosen therapy and have relatively localized disease. It is interesting to note that, in a single study, 39% of patients admitted to nonadherence with topical therapy [14]. In order to optimize compliance, simple regimens with once-daily applications are preferred [15,16]. Where the patient is particularly motivated, a more complex treatment regimen could be adopted. Where facilities exist, nurse-led educational sessions should be encouraged.

2.2 Vehicle

The choice of medicament vehicle is important in patient compliance and treatment success. There is an array of options available including creams, ointments, foams, oils, gels and sprays. The use of creams may be more appropriate where greasy preparations limit functional ability (e.g., increase the risk of falls when feet are affected) or are cosmetically unacceptable (e.g., on the facial skin). Foams, gels or sprays may be preferable when there is scalp involvement.

2.3 Volume

Volume of a given prescription is frequently overlooked and yet it is key to delivering an effective dose. An average patient will require about 400 g/week of topical therapy for...
a twice-daily regimen involving application of product to the trunk and limbs [17]. The fingertip unit is widely used to provide guidance on volume of topical agent required [18].

2.4 Dressings
Dressings are frequently used to enhance drug delivery. This is particularly true of corticosteroids [19]. The choice of individual dressings will be dictated by local availability and patient preference.

2.5 Emollients
Emollients provide a safe and useful adjunct in the treatment of psoriasis. Optimizing skin hydration is universally recognized to improve signs and symptoms of psoriasis [20]. Clinical trials involving topical corticosteroids demonstrated a placebo response of 15 – 47%, indicating that the emollient effect of the vehicle provides a significant therapeutic benefit [3].

The choice of emollient will be guided by the severity of xerosis and the preferences of both the clinician and patient. The emollient is generally applied 1 – 3 times a day. There are no known contraindications to emollient therapy, and emollients are regarded as safe in children, pregnancy and breast-feeding.

2.6 Corticosteroids
Corticosteroids are universally used in the management of all grades of psoriasis, both as monotherapy and as a complement to systemic therapy. They are available in a wide range of preparations including gel, cream, ointment, foam, spray, lotion and oil. Choice of agent will depend on patient choice, distribution of disease and local availability.

2.6.1 Pharmacology
Corticosteroids have a wide range of effects upon cellular metabolism. Therapeutic response is mediated via vasoconstrictive, anti-inflammatory and immunosuppressive effects.

Corticosteroids are lipophilic and readily migrate through the cell membrane to bind the corticosteroid receptor within the cell [21]. The receptor-corticosteroid complexes form dimers, which then migrate to the cell nucleus where they bind to corticosteroid response elements. Binding of the corticosteroid response elements induces the therapeutic effect via regulation of gene expression [12].

2.6.2 Potency
A classification of corticosteroid potency was suggested in 1985 by Stoughton and Cornell to reflect the vasoconstrictive properties of each drug [22]. In the UK, there are four potency groups: mild, moderately potent, potent and very potent.

Selection of potency for a given corticosteroid is guided by several factors, including area affected, previous treatment, disease severity and patient preference. In general, less potent corticosteroids are preferred for facial or intertriginous/genital skin and for use in children. It is generally accepted that high-potency corticosteroids should not be used for more than 2 weeks and that the patient should be under close medical observation [23].

2.6.3 Efficacy
Clinical trials of topical corticosteroids for the treatment of psoriasis have reported efficacy rates of between 41 and 92% [3]. It is important to note that most of these studies were done over a short time period and consequently do not provide information on long-term therapeutic gain. Concern over rapid relapse on cessation of therapy remains an unresolved issue.

2.6.4 Tachyphylaxis
The persistence and recurrence of psoriasis in an individual who has previously found therapeutic benefit from a topical corticosteroid was first described by du Vivier and Stoughton in 1975 [24]. Additional studies have failed to determine if this is truly a clinical entity or whether this simply reflects patient nonadherence [25]. This latter study highlights the importance of engaging the patient in a given regimen – topical therapy is time consuming and can be difficult to apply. Close supervision in the initial stages of treatment to provide support and address patient concerns is recommended.

2.6.5 Side effects
Topical corticosteroids are a useful intermittent therapy for controlling stable disease affecting relatively small areas of the body. The potency of topical corticosteroid should be moderated for flexural and/or facial skin. Therapy should be monitored by a competent healthcare professional to limit the risk of cutaneous or systemic side effects. The side effects of topical corticosteroids can be broadly categorized as local or systemic.

Local side effects include skin atrophy, telangiectasia, striae distensae, folliculitis, acne and purpura. Other conditions such as rosacea, perioral dermatitis and fungal infections may be exacerbated by overuse of topical corticosteroids.

The risk of skin atrophy is reduced by good medical supervision of treatment, treatment holidays and use of the corticosteroid with the lowest potency to maintain effect. In general, class I topical corticosteroids should be used for no more than 2 weeks [12,23]. The development of contact allergy to topical corticosteroids is well recognized and should be investigated where efficacy is lost or when the patient feels that application of treatment exacerbates their condition.

Systemic side effects of corticosteroids include hypertension, osteoporosis, Cushing’s syndrome, cataracts, glaucoma, diabetes and avascular necrosis of the femoral head or humeral head. In clinical practice evidence of these complications following topical therapy are relatively uncommon.

Hypothalamic pituitary adrenal (HPA) suppression is rarely symptomatic but well recognized. In a single trial of 40 patients treated with clobetasol ointment (class I), eight (20%) had evidence of HPA suppression on laboratory analysis [26]. Children are at a greater risk of such effects...
compared with adult patients, owing to their greater body surface area to weight ratio.

The effects of topical corticosteroid during pregnancy have been extensively reviewed recently [27]. This review included seven studies: one study found a link between topical corticosteroid use in the first trimester and orofacial clefting, another study found a link between very potent topical corticosteroid and low birth weight. Whilst the relative risk of topical corticosteroid in pregnancy seems low, the decision to treat should be made on an individual basis with full involvement of the patient. Their safety in breast-feeding is also unknown.

2.6.6 Class I corticosteroids (superpotent)

Five controlled trials for class I corticosteroids are reported in the literature.

Bernhard et al. demonstrated a 92% improvement in PGA in a 2-week, double-blind, placebo-controlled trial of 204 patients treated with halobetasol propionate 0.05% ointment to non-scalp disease. This compared with 39% in the placebo arm [28].

Olsen et al. demonstrated that 81% of patients treated with clobetasol propionate 0.05% scalp application achieved a 50% or greater improvement in their scalp psoriasis after 2 weeks of treatment in a study involving 378 patients. This compared with 22% in the control arm [29].

A 2-week, double-blind, placebo-controlled study of clobetasol propionate 0.05% foam, involving 279 patients, demonstrated a 68% clear or almost clear attainment at 2 weeks compared with 21% in the placebo arm in non-scalp sites [30].

A double-blind, placebo-controlled trial of clobetasol propionate 0.05% foam for non-scalp psoriasis used for 2 weeks achieved a moderate or better improvement in 58% of treated patients compared with 15% of the placebo arm in a study involving 81 patients [31].

A randomized, double-blind, placebo-controlled trial of amcinonide 0.1% lotion, involving 157 patients with scalp psoriasis, treated for 3 weeks, demonstrated clearance in 26% of the treatment arm compared with 1% in the placebo arm [32]. A > 50% improvement was observed in 78 and 27% for the treatment arm and placebo arm, respectively [32].

2.6.7 Class II corticosteroids (potent)

Two clinical trials have demonstrated efficacy of potent topical steroids.

A double-blind, vehicle-controlled study of halcinonide 0.1% solution to treat scalp psoriasis in 27 patients demonstrated that 74% of patients achieved an excellent or good response to treatment after 2 weeks compared with 45% of patients who were treated with vehicle alone [33].

Desoximetasone 0.25% cream used for 3 weeks to treat non-scalp disease achieved an improved mean overall evaluation score in 68% of patients compared with 23% in the placebo arm in a double-blind clinical trial involving 35 patients [34].

2.6.8 Class III corticosteroids (moderately potent)

Class III corticosteroids have been shown to be effective in four clinical trials.

Franz et al. performed a double-blind, placebo-controlled study of 172 patients treated with betamethasone valerate 0.12% foam over 4 weeks, achieving an improvement in PGA in 72% of patients compared with 47% of the control group [35].

Two randomized controlled trials of 383 patients treated with fluticasone propionate 0.005% ointment demonstrated good, excellent or clear skin in 68 – 69% of patients at 4 weeks. This compared with 29 – 30% in the control arm [36].

A placebo-controlled trial involving 40 patients treated with betamethasone valerate 0.12% foam for 12 weeks demonstrated a > 50% improvement in psoriasis in 70% of subjects compared with 24% in the placebo arm [37].

2.6.9 Class IV corticosteroids (mild)

Class IV corticosteroids have been shown to be effective in two clinical trials.

A study of 190 patients with mild to moderate psoriasis treated with hydrocortisone 17-butyrate 21-propionate 0.1% cream for 3 weeks demonstrated excellent or good improvement in 41% of patients compared with 18% of patients who received placebo [38].

A randomized, double-blind, controlled trial of 89 patients examining the efficacy of fluocinolone acetonide 0.01% oil for 3 weeks demonstrated 83% of patients had good or better improvement from baseline compared with 36% in the placebo arm [39].

Trial data for topical corticosteroids discussed above are summarized in Table 1.

2.7 Vitamin D analogs

Vitamin D analogs provide a useful adjunct in the treatment of chronic plaque psoriasis. Their discovery was prompted by the realization that oral vitamin D had a therapeutic effect on psoriatic plaques [40].

2.7.1 Pharmacology

Vitamin D analogs bind to the intracellular vitamin D receptor and then dimerize. These units migrate to the nucleus, where they bind the vitamin D response element, which directly regulates genes involved in epidermal proliferation, inflammation and keratinization.

There are three vitamin D analog preparations available to treat psoriasis: calcitriol, tacalcitol and calcipotriol.

2.7.2 Side effects

The most common adverse effects of treatment are skin irritation (burning, itching or stinging), dryness, peeling, erythema and edema which may occur in up to 35% of patients [41,42]. It would seem that adverse effects diminish with prolonged use. Concerns over calcium homeostasis appear to be minimal if
the maximum dose is not exceeded: 210 g calcitriol 3 µg/g, 70 g tacalcitol 4 µg/g, 100 g calcipotriol 50 µg/g.

2.7.3 Calcitriol
Calcitriol (1,25-dihydroxycholecalciferol) is the active form of vitamin D and is available as an ointment only. A randomized trial of 258 patients treated with either betamethasone dipropionate 0.05% ointment or calcitriol 3 µg/g ointment showed improvement in 82 and 79%, respectively, at 6 weeks. Whilst the extent of response was greater in the corticosteroid arm, the duration of remission was greater in the calcitriol arm; 25 and 48%, respectively, remained in remission at 8 weeks [43].

A significant concern over treatment with vitamin D analogs is the potential influence on calcium homeostasis. A trial of 59 patients treated with calcitriol 3 µg/g for 12 weeks and followed up for a further 8 weeks demonstrated no significant change in calcium metabolism [26]. Higher dosing of calcitriol demonstrated no greater efficacy but was associated with increased hypercalcemia [44]. A study of twice-daily calcitriol for up to 78 weeks demonstrated long-term efficacy and safety in a cohort of 255 patients. Slight hypercalcemia was noted in five (2%) patients [45].

2.7.4 Tacalcitol
Tacalcitol is a synthetic vitamin D analog differing from calcitriol by hydroxylation in the 1- and 24- positions. It is available as an ointment or lotion. A study of 304 patients treated with once-daily tacalcitol 4 µg/g for up to 18 months demonstrated a median reduction in PASI from 9.5 to 4.6 at 3 months with a further reduction to 3.25 at 18 months [46]. At the conclusion of the study, 197 patients remained on treatment with 5.9% dropping out because of skin irritation. No alteration of calcium homeostasis was detected. This has been supported by other studies demonstrating superior efficacy to placebo [47,48]. Tacalcitol is safe and effective in managing mild to moderate psoriasis (up to 20% BSA) over an 18-month period on an intermittent basis.

2.7.5 Calcipotriol
Calcipotriol (Calcipotriene) is a vitamin D analog designed to retain therapeutic efficacy whilst reducing potential effects on calcium metabolism. It is available as a cream, ointment or scalp solution. A randomized, double-blind, within-patient trial of 50 patients treated with 25, 50 and 100 µg/g calcipotriol ointment for 8 weeks showed a marked improvement of 40, 63 and 80%, respectively [49]. The safety of calcipotriol has only been established up to 1 year of follow up.

2.8 Calcineurin inhibitors (pimecrolimus and tacrolimus)
Calcineurin inhibitors have an established role in the management of eczema. Treatment of facial or intertriginous psoriasis is less well established and is an off-license therapy. There are
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two topical preparations of calcineurin inhibitors: tacrolimus ointment (0.03 and 0.1%) and pimecrolimus cream (1.0%).

2.8.1 Pharmacology
Calcineurin is a protein phosphatase essential in the proliferation of lymphocytes via induction of nuclear factor of activated T cells, a transcription factor that upregulates expression of interleukin (IL)-2. In addition, inhibition of transcription of IL-3, IL-4, IL-5, GM-CSF, TNF-α and IFN-γ is observed [50]. Inhibition of calcineurin is immuno-suppressive and oral preparations have utility in maintaining organ transplants.

2.8.2 Efficacy
Initial trials indicated treatment efficacy in patients with psoriasis when used under occlusion. This observation led to the belief that the penetration of treatment into thick plaques of psoriasis was limited. Consequently, tacrolimus and pimecrolimus have been used in areas of skin where their penetration is naturally enhanced, such as in flexural or facial skin.

A double-blind, randomized, controlled trial of 57 patients with flexural disease treated with 1% pimecrolimus cream demonstrated that 54% of patients in the treatment arm were clear or almost clear at 2 weeks compared with 21% in the vehicle arm. This improved up until the end of the study (8 weeks), when 71% of patients had an IGA score of 0 or 1 (clear or almost clear) [9]. A double-blind, randomized, controlled trial involving 167 patients demonstrated that 65.2% of patients treated with 0.1% tacrolimus ointment were clear or almost clear, based on the static severity score, at 8 weeks compared with 31.5% clear or almost clear in the control arm [51].

A comparative study of 80 patients treated with 1% pimecrolimus, 0.005% calcipotriol or 0.1% betamethasone valerate demonstrated pimecrolimus was less effective than either calcipotriol or betamethasone, but more effective than vehicle alone. Maintenance treatment using pimecrolimus with intermittent rescue therapy with topical corticosteroids has been suggested as a mechanism to reduce the long-term complications of prolonged corticosteroid use [52].

2.8.3 Side effects
Adverse reactions with the calcineurin inhibitors include local reactions such as burning and stinging, which tend to diminish with ongoing use. Clinical studies have not confirmed initial concerns over an association with malignancy [53]. Their effect in pregnancy remains unknown. Traces of the calcineurin inhibitor have been found in breast milk, and these products should not be used in mothers who are breast feeding [3].

2.9 Dithranol
Dithranol is an anthracycline that is well established in the treatment of psoriasis. Its use has declined as more cosmetically acceptable treatments have become available.

2.9.1 Pharmacology
The mechanism of action of dithranol remains obscure, although it is clear that anthracyclines inhibit mitochondria by disrupting structure and function resulting in apoptosis [54]. This results in antiproliferative effects that produce an observable reduction in psoriatic plaques.

2.9.2 Efficacy
The principle limitation of dithranol is mess and skin irritation. Dithranol may stain clothes and furniture. An extensive review of topical therapy revealed adverse events occurring in 72% of patients treated with dithranol [55]. There are two standard application methods of dithranol: i) short-contact dithranol cream applied to affected lesions as a day case or outpatient; ii) application of dithranol paste or ointment for 24 h typically as an inpatient. The short-contact regimen offers a more realistic treatment option in the outpatient setting but is less effective than applications of dithranol ointment or paste for 24 h [56]. In isolation, dithranol is less effective than topical corticosteroids or vitamin D analogs [55]. Incremental concentrations of dithranol paste or ointment are often used in conjunction with ultraviolet (UV)B phototherapy – the Ingram regimen [57].

A double-blind, controlled trial of 27 patients treated with 2% dithranol for 1 min on one half of the body and with placebo on the other half reported a statistically significant difference in erythema, infiltration and scaling on the dithranol-treated areas after 8 weeks [58]. A second trial using dithranol gel demonstrated a reduction in combined severity score after 4 weeks of treatment from 6.3 at the start of the trial to 1.1 and 4.1 for the treatment and placebo arms respectively. An additional, comparative study of calcipotriol versus dithranol gel demonstrated similar efficacy over 8 weeks but with a greater number of side effects in the dithranol-treated group [59].

2.10 Coal tar
Coal tar has been an established treatment option for psoriasis for more than a hundred years. There are a number of tar-based preparations including crude coal tar, wood tar (e.g., pine and juniper) and shale tar [60]. Whilst effective, the main limitations of tar are poor cosmetic acceptability and staining of clothes, skin and furniture. It is frequently used as part of an inpatient or daily dressing regimen. Its use in conjunction with UVB – the Goëckerman regimen – is well recognized [61]. In an attempt to limit mess, refined preparations are available and have proven useful in the outpatient setting.

2.10.1 Pharmacology
The mode of action of coal tar is not precisely known, although it clearly has antiproliferative actions. This is probably through suppression of DNA synthesis, thereby reducing the hyperproliferative state of keratinocytes.
2.10.2 Efficacy

Few controlled trials are reported in the literature. A randomized, double-blind, controlled study of 18 patients treated with 5% liquor carbonis detergens demonstrated a 48.7% mean improvement compared with 35.3% of patients treated with vehicle only [62]. A randomized control trial of 324 patients, comparing 1% coal tar lotion with 5% crude coal tar, demonstrated a significantly greater improvement in mean PASI of 2.4 and 1.5, respectively [63].

2.10.3 Side effects

Coal tar is often difficult to use, and adverse effects include folliculitis, skin irritation, and contact dermatitis. Occupational coal tar exposure is a recognized carcinogen. However, there is no evidence to support an association with carcinogenesis in patients with psoriasis who have had treatment with preparations containing coal tar [64-66]. Treatment with psoralen (P)UVA and coal tar is not recommended and has been estimated to produce a 2.4-fold increased risk of skin cancer [65]. Coal tar may be used during pregnancy [67].

2.11 Tazarotene

The development of topical preparations of retinoids in the late 1990s promised an additional option in the therapeutic armamentarium for psoriasis. Tazarotene is available as a gel or cream and at concentrations of 0.1 or 0.05%.

2.11.1 Pharmacology

A retinoid derivative, tazarotene binds the retinoic acid receptor (RAR) in a class-specific manner, preferentially binding RAR-γ and RAR-β over RAR-α [68]. It does not bind retinoid X receptor (RXR) [69]. The regulation of transcription induced by tazarotene binding the receptor results in reduced epidermal hyperproliferation, normalizing keratinocyte differentiation and decreasing inflammation [70].

2.11.2 Efficacy

Two placebo-controlled trials comparing 0.1 and 0.05% tazarotene cream over a 12-week study have been performed. A total of 1303 patients were recruited, of which 892 patients completed the trial. Treatment success, as defined by at least a moderate global response or better and assessed by plaque thickness, erythema and scale, was achieved in 49% of patients treated with preparations containing coal tar [64-66]. Treatment with psoralen (P)UVA and coal tar is not recommended and has been estimated to produce a 2.4-fold increased risk of skin cancer [65]. Coal tar may be used during pregnancy [67].

A trial involving 348 patients, comparing tazarotene 0.1% gel, tazarotene 0.05% gel and fluocinonide 0.05% cream showed comparable efficacy in all three arms of the study with significantly greater remission rates at 12 weeks post-treatment amongst the tazarotene cohort [72].

2.11.3 Side effects

Tazarotene may cause skin irritation, including burning, stinging and itch in up to 30% of users [71]. The use of cream, low concentration and alternate-day application may help alleviate such symptoms [73]. Concomitant use of topical corticosteroid may also minimize symptoms. Retinoids may reduce UV tolerance and concomitant UVB and tazarotene has proven more efficacious than UVB alone [74]. Given the established risk of fetal harm with systemic retinoids, tazarotene is contraindicated in pregnancy.

2.12 Keratolytics

Keratolytics provide a useful adjunct to treatment where hyperkeratosis is symptomatic or limits the efficacy of other topical treatments. Options for therapy include salicylic acid, urea, propylene glycol and glycolic acids.

2.12.1 Salicylic acid

Salicylic acid is a topical keratolytic used in the treatment of a variety of papulosquamous lesions. The action of salicylic acid in inducing keratolysis is unclear, although disruption of keratinocyte-keratinocyte binding in addition to reducing the pH within the stratum corneum is thought to be important [75].

Salicylic acid preparations are often used in conjunction with other treatments with the intention to increase absorption and efficacy of the second drug. They should be avoided when an oral salicylate is being used and should not be used to treat patients with > 20% BSA involvement when systemic absorption is likely to be significant. Salicylic acid reduces the efficacy of UVB therapy owing to its filtering effect. It should not be applied immediately before treatment. Salicylic acid preparations are generally avoided during pregnancy, although there is limited evidence for harm.

2.12.2 Urea

Urea reduces transepidermal water loss and induces keratinocyte differentiation in psoriasis [76]. It may prove a useful adjunct where xerosis and hyperkeratosis is particularly marked or problematic.

2.13 Combination therapy

The use of multiple therapies is routine in dermatological practice and may provide significant benefit in certain situations. Consideration of patient burden both in terms of mess and time are important and can dramatically impact on compliance with treatment. This emphasizes the need for involvement of the patient in treatment decisions.

2.13.1 Vitamin D analog and corticosteroid

The combination of a vitamin D analog and a corticosteroid has proven more effective than either agent alone and is routinely used in the treatment of psoriasis. It is available as an ointment or scalp gel. Combined 50 μg/g calcipotriol and betamethasone dipropionate 0.5 mg/g has been studied in several trials [77-80]. A double-blind, randomized, vehicle-controlled trial of 1603 patients treated with combination therapy (as ointment), betamethasone alone, calcipotriene
alone or vehicle alone demonstrated a 71.3, 57.2, 46.1 and 22.7% reduction in PASI respectively at 4 weeks [72].

Long-term safety of combination therapy with calcipotriol and betamethasone remains a significant concern. A double-blind, placebo-controlled, trial of 634 patients treated with one of i) combination therapy (as ointment), ii) 4-weekly alternating calcipotriol and combination therapy or iii) 4 weeks combination followed by 48 weeks calcipotriol reported that after 52 weeks adverse drug reactions associated with long-term topical corticosteroid therapy occurred in 4.8, 2.8 and 2.9%, respectively [81]. This was not statistically significant. Atrophy developed in 4 patients (1.9%) in the continuous combined therapy arm. The authors concluded that combination therapy provides a safe, long-term option for management.

More recently, the introduction of combined calcipotriene 50 µg/g and betamethasone dipropionate 0.5 mg/g gel (combination therapy) has added another option to the management of scalp psoriasis. A randomized, double-blind, controlled trial involving 568 patients treated for 8 weeks with combination therapy, betamethasone, calcipotriene or vehicle achieved ‘absent’ or ‘very mild’ in 68.4, 61.0 and 43.3% of patients, respectively [82].

### 3. Recommendations

The wide range of options available to manage mild to moderate psoriasis presents a significant challenge to delivering good-quality patient care. Our suggested options are summarized in Table 2.

### 4. Expert opinion

Topical therapy is used predominantly for individuals with mild disease and may also provide additional benefit for partially controlled psoriasis managed with systemic agents. It is important when using topical therapy to remember:

- That the goal of treatment is to control or reduce the extent of psoriasis so that it no longer impacts on a patient’s quality of life.
- That patient education is essential.
- That discussion of treatment options is important so that patients know what to expect from treatment in terms of overall results, time scale of improvement and the personal effort involved.
- To consider the psychological wellbeing of the patient.
- To allow enough time for a treatment to demonstrate efficacy before considering an alternative.
- To prescribe appropriate quantities of treatment.
- To follow up verbal advice with information leaflets.
- To review patients regularly.

Other treatments available at present for the management of psoriasis are: phototherapy for moderate disease; and systemic agents including photochemotherapy, oral agents and biological agents for the management of severe psoriasis. It is appropriate to consider use of these therapeutic strategies under the following circumstances:

- > 20% BSA involvement
- Psoriasis that is unresponsive to topical therapy
- Psoriasis that is unstable or frequently flaring
- Psoriasis associated with a high psychological burden
- Generalized pustular psoriasis
- Erythrodermic psoriasis.

### Declaration of interest

HS Young has received sponsorship from Leo Pharma and Steifel Laboratories.

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### Table 2. Suggested topical therapy for management of psoriasis.

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<thead>
<tr>
<th>Affected area</th>
<th>Severity</th>
<th>Treatment</th>
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<tbody>
<tr>
<td>Palmar-plantar disease</td>
<td>Mild</td>
<td>Potent corticosteroid, Vitamin D analog, Salicylic acid preparations</td>
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<tr>
<td></td>
<td>Moderate</td>
<td>Calcipotriol and betamethasone, Potential corticosteroid and salicylic acid</td>
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<tr>
<td>Scalp</td>
<td>Mild</td>
<td>Tar based shampoo</td>
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<tr>
<td></td>
<td>Moderate</td>
<td>As per mild plus, Calcipotriol and betamethasone, Potential corticosteroid</td>
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<tr>
<td>Scalp</td>
<td>Severe</td>
<td>As per moderate plus, Salicylic acid/tar based preparations</td>
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<tr>
<td>Trunk and limbs</td>
<td>Mild</td>
<td>Potential corticosteroid, Vitamin D analog, Refined tar preparations</td>
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<td>Moderate</td>
<td>Calcipotriol and betamethasone, Dithranol</td>
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<td>Mild potency corticosteroid, Vitamin D analog, Calcineurin inhibitor</td>
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<tr>
<td>Face and hairline</td>
<td>Mild</td>
<td>Mild potency corticosteroid plus antimicrobial preparations</td>
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<td>Moderate</td>
<td>Moderate potency corticosteroid plus refined tar preparations</td>
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