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An Update on Scalp Psoriasis

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Abstract. Abstract. Between 50 % and 80 % of patients with psoriasis have involvement of the scalp. The clinical presentation of scalp psoriasis can be very varied, with disease severity ranging from mild to extremely severe. The disease may have a major psychological impact. Treatment should be tailored to each individual in order to achieve a good clinical response or blanching that lasts for as long as possible, with a safe and convenient regimen. Many different treatments have been tried: phototherapy, pulsed magnetic fields, Grenz rays, keratolytics, coal tar, antifungals, dithranol, retinoids, vitamin D analogues, corticosteroids, and systemic treatment. Ideally, for scalp psoriasis, treatment should be effective; applied in the form of a lotion, foam, or emulsion; require few applications per week; and have proven long-term safety. One such treatment is potent corticosteroids and vitamin D3 analogues in combination, which has a fast onset of action and proven long-term safety.

Key words: psoriasis, scalp, topical treatment, systemic therapy.

PSORIASIS DEL CUERO CABELLUDO

Resumen. La psoriasis del cuero cabelludo afecta al 50-80 % de los pacientes psoriásicos. Su presentación clínica puede ser muy variable: desde una enfermedad leve hasta formas muy graves. Esta condición puede provocar un gran impacto psicológico. El principal objetivo del tratamiento es individualizar el mismo en cada paciente, conseguir una buena respuesta clínica o el blanqueo mediante un tratamiento seguro y cómodo, con una respuesta lo más duradera posible. Se han usado múltiples tratamientos: fototerapia, campos magnéticos pulsátiles, rayos Grenz, queratolíticos, alquitrán de hulla, antifúngicos, ditranol, retinoides, análogos de la vitamina D, corticoesteroides y tratamiento sistémico. El perfil farmacológico ideal para tratar la psoriasis del cuero cabelludo es aquel que sea efectivo, de aplicación intermitente pocas veces por semana en forma de loción, espuma o emulsión y seguro a largo plazo, como la combinación de corticoesteroides potentes y análogos de la vitamina D3, con efecto rápido inicial y seguridad a largo plazo demostrada respectivamente.

Palabras clave: psoriasis, cuero cabelludo, tratamiento tópico, tratamiento sistémico.

Introduction

Scalp involvement in patients with psoriasis is one of the most frequent manifestations over the course of the disease. Between 50% and 80% of patients present scalp involvement alone or in conjunction with lesions on other parts of the body.[1] In a study on the prevalence of chronic liver disease in patients with psoriasis,[2] we found scalp involvement in 68.3% of cases and predominant scalp involvement in 7.3% of cases (n=164). Moreover, the scalp, together with the face, is one of the parts of the body most affected by psoriasis in childhood and adolescence.

Scalp psoriasis may be associated with different types of psoriasis: psoriasis vulgaris; chronic plaque psoriasis; guttate psoriasis; inverse psoriasis; pustular psoriasis; erythrodermic psoriasis; psoriatic arthritis or nail psoriasis. In our study, 53% of patients presented nail involvement associated with scalp psoriasis.[3]

The clinical presentation of psoriasis can be very varied, ranging from mild disease with light desquamation, to more severe and recalcitrant forms with thickened crusted plaques that may affect the entire scalp. These lesions can involve the hairline and extend beyond, affecting the facial area, with visible desquamation and plaques. The disease may have a major psychological impact on sufferers. Many studies have been carried out that show the considerable psychosocial impact of the disease on its sufferers; stress is

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Table 1. General Aspects of Scalp Psoriasis

Affects between 50% and 80% of psoriasis patients, alone or concomitant with lesions in other areas
Usually one of the first locations, particularly in childhood and adolescence
Highly variable clinical presentation (from mild to recalcitrant forms)
Difficult to treat due to the inaccessible nature of the scalp and its proximity to the facial area
Considerable effect on quality of life due to the visibility of the lesions and pruritus
May coexist with seborrheic dermatitis or form part of the same entity (sebopsoriasis)

reported as one of the most frequent trigger factors in 43% of those surveyed (n=1500).[4]

The literature mentions different therapeutic agents for the treatment of scalp psoriasis, from corticosteroids and vitamin D analogues to phototherapy and shampoos, in different combinations. Despite the abundance of available treatments, scalp psoriasis is more difficult to treat than psoriasis in other locations as the surface is relatively accessible due to the hair and because of its proximity to the facial skin, which is more susceptible to potential irritants. Patients often fail to adhere to the prescribed treatment due to its organoleptic characteristics, such as the smell or greasy feeling of the preparations.

In this article, we discuss the clinical characteristics, differential diagnosis, effects on quality of life, and the appropriate therapeutic approach for controlling scalp psoriasis (Table 1).

Clinical Presentation

Scalp psoriasis is often the first manifestation of the disease and may be sustained for years despite remission in other areas. Lesions are usually scaly, erythematous, individual, and clearly defined, with silvery white scales. Confluent plaques may occur in some cases. The most common locations are behind the ears, above the hairline, and in peripheral areas of the face, such as the temples and the upper part of the back of the neck (Figure 1).

In a study of 1023 surveyed psoriasis patients, 84% presented involvement of the scalp. Psoriasis affected more than half of the scalp in 48% of these patients. The most common symptoms and those of most concern to these patients were desquamation (86%) and pruritus (73%)[5] (Table 2).

This study found that 81% of patients had suffered from the disease for more than 5 years, 62% for more than 10 years, and 40% for more than 20 years.[5]

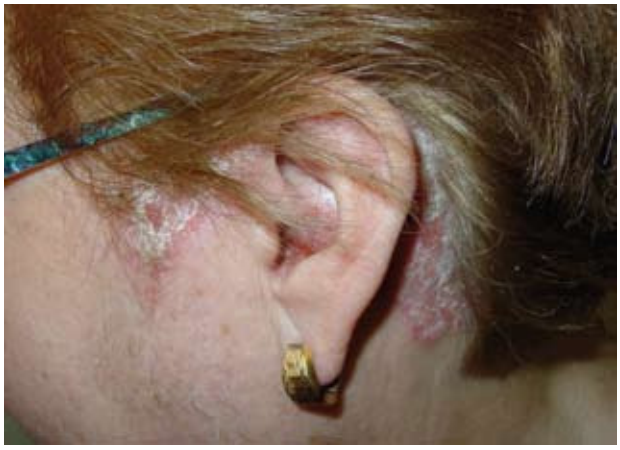

Figure 1. Patient with scalp psoriasis. Involvement of the skin beyond the hairline around the temple and behind the ear, in the form of visible well-defined, individual, silver-white, erythematous scaly plaques.

Table 2. Signs and Symptoms of Psoriasis in General and With Scalp Involvement in the Review by Van der Kerkhof[5]

Most Frequent Signs and Symptoms in Psoriasis
Desquamation: 79%
Eritema: 65%
Signs and Symptoms That Most Concern Psoriasis Patients
Visibility of the lesions: 34%
Pruritus: 26%
Desquamation: 16%
Erythema: 6%
Most Frequent Signs and Symptoms That Most Concern Patients With Scalp Involvement
Desquamation: 86%
Pruritus: 73%

Scaling may occur in patches or be diffuse or fine. Fine scaling may be the first sign of the disease in children and young adults.

Scalp psoriasis does not cause hair loss, although telogen effluvium and reduction of hair density may occur in the area of the plaques. Some cases of scarring alopecia in extensive lesions in some erythrodermic forms and chronic severe hyperkeratosis have been reported.[1]

Table 3. Diseases to Consider in the Differential Diagnosis of Scalp Psoriasis

Seborrheic dermatitis
Seborrheic pemphigus
Allergic contact dermatitis
Atopic dermatitis with superinfection
Actinic keratosis
Subacute lupus erythematosus.
Common pemphigus
Bowen disease (in isolated plaques)
Cutaneous mycosis *(Tinea capitis, etc)*
Dermatomyositis with scalp involvement

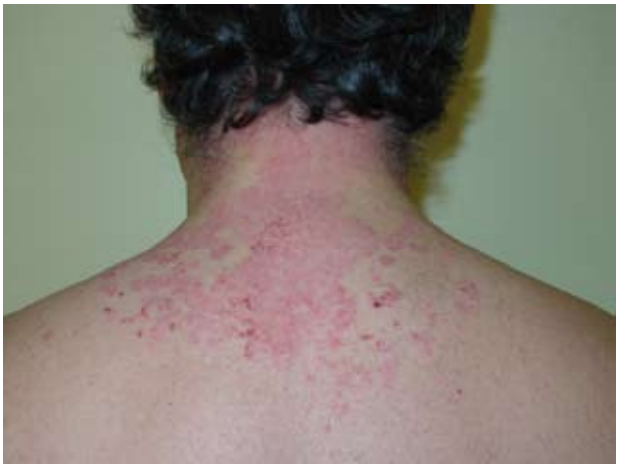

Figure 2. Patient with sebopsoriasis around the hairline in the occipital region.

Differential Diagnosis

Scalp involvement should suggest the possibility of psoriasis and be grounds for seeking lesions in commonly affected areas, such as the knees, elbows, and nails. Seborrheic dermatitis, mycotic infection, and allergic contact dermatitis are some of the other differential diagnoses that should be ruled out (Table 3). Psoriasis may coexist with seborrheic dermatitis and the 2 entities may be histologically indistinguishable. The erythematous and furfuraceous scales in seborrheic dermatitis are characteristically located more diffusely on the scalp, face, and torso. Both conditions have been associated with infection by *Malassezia globosa*, *Malassezia restricta* and *Malassezia furfur*. The latter is more frequently found in the follicular channels of seborrheic dermatitis and may be implicated in the pathogenesis of scalp involvement.[1] It has been suggested that psoriasis may develop from seborrheic dermatitis with a Koebner response secondary to colonization by this yeast. For most authors, this would represent a spectrum of the disease that could be described as *sebopsoriasis*[6] (Figure 2).

Another important differential diagnosis to consider in bald patients is Bowen disease, which occasionally requires a histologic examination to be ruled out.

Effect on Quality of Life

The chronic nature of psoriasis and its prevalence mean that it has a considerable impact on quality of life even though it is not a life-threatening disease. The emotional and social effects of scalp psoriasis, particularly the moderate to severe form with extensive, unsightly, and incapacitating lesions, have been well documented in several studies.[5,7] These forms have been shown to impose considerable limitations on quality of life in between 30% and 50% of patients in aspects such as vacations, sport, work, interpersonal relations, life in the home, and sexual relations. Useful and reproducible tools have been developed in recent years to evaluate quality of life, including the SF-36 generic questionnaire and more specific tools such as the Psoriasis Disability Index (PDI) and Scalpdex. Scalpdex is an instrument that allows intrapersonal and interpersonal comparisons and makes it possible to investigate and evaluate the available treatments to detect therapeutic benefits to the quality of life of our patients.[8] The index consists of 23 items and has been specifically developed to measure quality of life in individuals with scalp dermatitis.[9] When this instrument was introduced, it showed depression in 19.6% of patients, hesitancy in 27.5%, and discomfort in 33.3%. Despite the availability of these instrument, further standardized studies are needed to evaluate therapies over the short and long term and to show the effects on the quality of life of patients.

Therapeutic Approach

The main objective in the treatment of scalp psoriasis is to tailor it to the clinical characteristics of each patient and the specific conditions of this location in order to achieve a good clinical response or blanching, with a safe and convenient regimen. The response should be long-lasting with periods free from the disease.[10] No treatment achieves complete remission of psoriasis and therapeutic measures therefore aim for partial, nonpermanent control of the lesions. Many different treatments have been tried

in scalp psoriasis, including phototherapy, pulsed magnetic fields, Grenz rays, keratolytics, coal tar, antifungals, dithranol, retinoids, vitamin D analogues, corticosteroids, and systemic treatment. Few properly controlled clinical trials have been performed, most of them open-label with a small number of patients, no comparators, and considerable variability in design.[1] Treatment protocols for scalp psoriasis are based on the individual experience of each dermatologist. According to the study by Van der Kerkhof,[5] most medical prescriptions were for potent topical corticosteroids; these were used in combination in 63% of cases. New studies are needed, particularly with long-term treatments lasting more than 8 weeks, as most of the studies performed have been based on short-term follow-ups. Ideally, for scalp psoriasis, pharmacologic treatment should be effective; applied in the form of a lotion, foam, or emulsion; require few applications per week; and have proven long-term safety.

This form of psoriasis is more difficult to treat than the common form affecting the rest of the body, due to the greater inaccessibility of the scalp and the greater thickness of the plaques.

Following is a summary of the scientific evidence currently available on the efficacy of the different therapeutic options for scalp psoriasis.

Topical Therapeutic Agents

Topical treatment forms the therapeutic basis for scalp psoriasis. The available active ingredients include keratolytics, coal tar, antifungals, dithranol, retinoids, corticosteroids, and vitamin D analogues (Table 4). The most commonly used vehicles are shampoos or direct application to the scalp by means of alcohol-based lotions, gels, foams, emulsions, creams, or ointments (Table 5). Many preparations are greasy and cause the hair to stick together, have an unpleasant smell, and cause pruritus or local irritation, with a higher risk of lack of treatment adherence and reduced effectiveness. According to the study by Van der Kerkhof,[5] 34% of patients preferred lotions, 32% preferred shampoos, 20% preferred emulsions, and 6% preferred creams; the most highly rated aspects were efficacy, maximum safety in the long term, and ease of application with nongreasy excipients.

A recent meta-analysis of the use of topical agents in the treatment of plaque psoriasis identified 42 well designed placebo-controlled studies, of which only 11 specified the treatment used for scalp lesions.[11] This meta-analysis shows the marginal efficacy of most of the agents, with the exception of potent corticosteroids (betamethasone dipropionate, diflorasone diacetate, desonide, fluticasone propionate, hydrocortisone butyrate, and mometasone furoate), very potent corticosteroids (clobetasol propionate, halcinonide, and halobetasol), vitamin D analogues, and a combination of very potent corticosteroids with calcipotriol. This combination makes it possible to reduce side effects such as burning and irritation that can be caused by the corticosteroids and calcipotriol, respectively, at the beginning of therapy.

Corticosteroids

Corticosteroids have been the mainstay of the treatment of scalp psoriasis for more than 30 years. Proof of their efficacy was weak due to the lack of adequately controlled studies. Recent studies have clarified the issue of their efficacy by showing fluocinolone acetonide, in oil, and clobetasol propionate, in shampoo, to be superior to their respective

Table 4. Most Commonly Used Treatments for Scalp Psoriasis

Keratolytic agents (salicylic acid in concentrations higher than 2%, urea at concentrations of between 10% and 40%, alpha hydroxy acids, glycolic acid, resorcin)
Coal tar, Ichthyol
Dithranol (anthralin)
Antifungals (1.5% ciclopirox olamine, 2% ketoconazole, 2% clotrimazole)
Retinoids (tazarotene)
Corticosteroids (medium or high potency)
Vitamin D Analogues Calcitriol Tacalcitol Calcipotriol

Table 5. Level of Acceptability by Type of Vehicle Used in the Treatment of Scalp Psoriasis

Acceptance by patient (higher to lower)
Shampoo
Alcohol-based lotions
Gels
Foams
Emulsions
Creams
Ointments

vehicles in patients with moderate to severe forms of scalp psoriasis.[12,13] These agents inhibit epidermal proliferation, reduce inflammation, and modulate the immune response. They have a rapid response and can be applied using different vehicles, though potency and bioavailability will vary depending on the vehicle used. It was thought that unguents and ointments allowed the greatest penetration, but current studies show that vehicles such as foam may be as effective or more so. According to 2 studies,[14,15] clobetasol propionate 0.05% in foam improved efficacy and reduced the severity of desquamation after 2 weeks of treatment when compared to the solution. Clobetasol propionate, a 5th-generation corticosteroid, is a potent molecule that has been approved in Spain in cream, shampoo, gel, solution, foam, and ointment formulations. Some patients reported a burning sensation a few minutes after application, but this sensation disappeared in subsequent applications and did not require treatment to be discontinued. These studies showed that clobetasol propionate reduces erythema, plaque thickness, and desquamation; it is well tolerated, easy to use, and satisfactory for the patient.[16] Different studies have shown the presentation of 500 mg per gram of clobetasol propionate in foam to be a stable vehicle that is thermolabile and has low residue.[17] The structure of the foam is broken down by body heat when applied to the skin, the active ingredient is deposited on the skin within seconds, and a minimal residue is left on the surface, allowing the active ingredient to penetrate deeply into the epidermis. The water and alcohol components volatilize rapidly. Peak skin penetration with this type of vehicle is almost double that of the solution formulation, as shown in experimental skin models.[17] Despite the high degree of efficacy of these agents, their use is limited to short-term treatments due to the lack of data showing their efficacy and safety over the long term. For this reason, combinations with other agents, such as vitamin D analogues, are used.

Vitamin D Analogues

The 3 molecules, calcipotriol, tacalcitol, and calcitriol, were introduced in 1992. They inhibit both epidermal proliferation and inflammation and promote normal keratinization, with a considerable antipsoriatic effect. Tacalcitol in unguent and in emulsion was shown to be effective in scalp psoriasis in a uncontrolled open-label study of 50 patients over 8 weeks.[18,19] It also improves the lesions in the sebopsoriasis forms. The calcipotriol molecule has been the object of long-term studies that show its effectiveness, also on the scalp, without apparent tachyphylaxis during 12 months of treatment and with significant control of the disease.[20] Facial irritation occurs at the beginning of treatment in some cases, although this is usually transitory and attenuates with repeated use.

Combination of Calcipotriol and Corticosteroids

The combined use of calcipotriol with betamethasone dipropionate has been shown to be more effective than either of the separate components in the treatment of common psoriasis affecting the body, after 4 weeks of treatment.[21-23] This combination has been studied in the context of scalp involvement in 2 studies with small sample sizes (n=10 and n=9), showing improvement of symptoms at 2, 6, and 12 weeks[1,24] Another study (n=110) showed this combination to have greater efficacy at 8 weeks compared to the same active ingredients used separately with the same vehicle[21]; the combination was better tolerated and treatment adherence was better due to the single daily application. Gel formulations have been achieved that improve acceptance by patients, who tend to reject ointments due to their greasy properties, difficult application and the need to wash the hair. The main benefit of clobetasol propionate is the fast onset of action and that of calcipotriol is its safety. New studies have recently been published[25] on the combination of clobetasol propionate in foam form with calcipotriol in ointment form, which is significantly more effective in the short term than when used in monotherapy. Koo et al[25] present sequential or strategic *during the week/weekend* therapy consisting of 3 phases. This treatment maximizes efficacy and achieves faster improvement of symptoms while minimizing the side effects of the topical drugs. The first phase is the *clearing* phase, in which calcipotriol is used together with clobetasol propionate twice daily for 2 weeks to reduce the effects of local irritation caused by the vitamin D analogue. In the second or *transition* phase, use of the very potent corticosteroid is limited to weekends and calcipotriol is maintained during the week. The objective is to prevent the rebound effect of sudden interruption of the corticosteroid by gradually withdrawing it, and to improve maintenance of the remission. In the third and final phase or *maintenance* phase, long-term treatment with calcipotriol continues to sustain the remission with the highest possible level of safety (Table 6).

Keratolytic Agents

Keratolytics such as salicylic acid in concentrations greater than 2%, urea in concentrations of between 10% and 40%, alpha hydroxy acids, glycolic acid, and resorcin, have been shown to increase the penetration of other

Table 6. Sequential Therapeutic Strategy in the Topical Treatment of Scalp Psoriasis According to the Review by Koo et al[25]

Treatment Phase	*Active Ingredients*	*Benefit*
Phase I (clearing) 2 weeks	Clobetasol or betamethasone propionate + calcipotriol (twice daily for 2 weeks)	Maximizes efficacy with faster onset of action and minimizes side effects
Phase II (transition) 2 weeks	Clobetasol or betamethasone propionate on weekends + calcipotriol during the week (twice daily for 2 weeks)	Maintains remission
Phase II (maintenance) Long term	Long-term calcipotriol	Maximizes long-term safety

topical treatments; their use in conjunction with vitamin D analogues is not recommended.[26]

Bitumen Derivatives, Dithranol, Coal Tar, and Ichthyol

Preparations with dithranol have been used effectively for decades in scalp psoriasis. Dithranol has the ability to induce a cascade of free radicals and inhibit some etiopathogenic aspects of the disease; it inhibits enzyme metabolism and reduces mitotic activity. It is currently less frequently used as it stains tissue dark brown and is difficult to remove from the hair.

Other little-studied topical treatments are bitumen derivatives with sodium chloride and phenol, and coal tar preparations in gel or shampoo; these preparations are little used due to their unpleasant smell and potentially mutagenic properties. Ichthyol, however, has been shown not to be mutagenic, can be used during pregnancy and breastfeeding, and is better tolerated by patients due to its less unpleasant smell.[27]

Despite the disadvantages of these products, they continue to be used frequently, particularly in the form of shampoo.

Antifungal Agents

The association of scalp psoriasis with seborrheic dermatitis has made it possible to study the response to antifungals; a favorable response has been shown to 2% ketoconazole, 1.5% ciclopirox olamine, and 2% clotrimazole. Different studies have failed to show the effectiveness of topical application of itraconazole, although the combination of 1% bifonazole with 40% urea was shown to be effective in a study of 71 patients with seborrheic dermatitis and scalp psoriasis.[1,28]

Phototherapy

Phototherapy has, for years, been one of the most traditional treatments for psoriasis. Few studies have been performed on this treatment and all of them have a small sample size. It is currently reserved for moderate to severe psoriasis lesions or lesions resistant to topical treatment. Systemic psoralen plus UVA (PUVA) treatment, narrow-band (311 nm) UVB therapy, topical PUVA, and other varieties, such as 308-nm excimer laser or microphototherapy, may be used. The affected areas of the scalp must be directly exposed to the treatment. Today, systemic PUVA treatment is being displaced by narrow-band UVB treatment, with a usual regimen of 3 sessions per week; this is more convenient as patients do not have to take psoralen or use sunglasses to protect themselves from sunlight.[10]

Grenz Rays

Grenz rays use electromagnetic radiation similar to x-rays but with less penetration. Grenz rays used with betamethasone propionate have been shown to clear up lesions more faster and with longer remissions (n=17).[29]

Systemic Treatment

Systemic treatment is considered when patients do not respond to topical treatment or when lesions occur on other areas of the body. In general, there is no difference between the different classic systemic treatments, such as methotrexate, cyclosporine, acitretin, or fumaric acid salts, and current biologic treatments, such as efalizumab, etanercept, infliximab, and adalimumab, for the treatment of scalp psoriasis.

Infection with the hepatitis C virus should be ruled out before beginning any systemic treatment as a study pub-

Table 7. Summary of Most Commonly Used Treatments for Scalp Psoriasis

1	Corticoides y derivados de la vitamina D, solos o en combinación New vehicles: foams, shampoos, lotions, etc.
2	Shampoos may be associated with antifungals (ciclopirox olamine, ketoconazole, clotrimazole) and Ichthyo
3	If no improvement occurs, associate with classic or biologic systemic treatment
In clearly defined lesions, apply narrow-band UVB at 311 nm locally	

lished by the authors showed that patients with chronic liver disease present more extensive outbreaks that are resistant to treatment, with a high seroprevalence of healthy carriers of the virus.[2] If systemic treatment is required, the appearance of infections should be closely monitored and a tuberculin test and serology for the human immunodeficiency virus and hepatitis B and C viruses should be performed before beginning treatment.[10]

Table 7 shows a summary of the treatment of scalp psoriasis and Table 8 shows some of the extemporaneous preparations commonly used by the authors.

Conclusions

Scalp involvement in psoriasis is frequent and, due to the visibility of the lesions and pruritus, it has a considerable effect on the quality of life of these patients. Many topical treatments have been used in recent years for this type of psoriasis, with few adequately controlled studies to support the efficacy of any of them. Patient dissatisfaction with these treatments is high, making the use of less greasy vehicles that are easy to apply and safe over the long term important. We currently have stable vehicles, such as foams, that leave little greasy residue and allow maximum penetration and deposition of the active ingredient with minimal surface residue. In general, gels and foams are preferred to creams or ointments. Other preparations, such as dithranol and coal tar are less acceptable to patients as they stain clothing or have an unpleasant smell.

Corticosteroids continue to be the favorite treatment for scalp psoriasis, together with vitamin D analogues. The best therapeutic option for proper control of the disease has been shown to be a combination of corticosteroids, with a fast onset of action, at the beginning of treatment, and vitamin D analogues, with their proven safety, over the long term.

Table 8. Extemporaneous Preparations Most Commonly Used in Scalp Psoriasis

Principal Active Ingredients	*Secondary Active Ingredients*
0.05% clobetasol propionate	1.5% ciclopirox olamine
0.1% triamcinolone acetonide	2% ketoconazole
Coal tar	Keratolytics
Ichthyol Pale	10%-30% urea 5% salicylic acid 10%-20% propylene glycol 12%-20% ammonium lactate 15% glycolic acid
	Cooling agents 0.1%-0.25% mentho
Ideal Excipientss	
Anionic sulfonate detergent	
Water-alcohol gel	
Water-alcohol solution	
Scalp oil	
Oil-water emulsions	
Severe Lesions	*Milder lesions*
Nighttime treatment	
Lanette ointment to 100 g 6%-10% Doak tar 3%-5% salicylic acid 1% clotrimazole 0.1% betamethasone	Beeler base to 100 g 1.5% ciclopirox olamine 0.1% triamcinolone 5%-10% urea
Surfactant base to 250 g 1.5% ciclopirox 2% zinc pyrithione 5%-8% coal tar 8%-10% glycolic acid	Lanette ointment QS 200 g 0.1% betamethasone 6%-10% urea 1% clotrimazol Surfactant base to 200 mL 2% zinc pyrithione 2% ketoconazol
Morning shampoo	
Scalp oil to 100 ml (water-alcohol solution) 1% clotrimazole 2%-4% salicylic acid 0.05% clobetasol	Scalp oil to 100 ml (water-alcohol solution) 0.1% triamcinolone 1.5% Ichthyol Pale 1% clotrimazole

Abbreviation: QS, quantity sufficient.

Conflicts of Interest

The authors declare no conflicts of interest.

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