European Review for Medical and Pharmacological Sciences 2023; 27: 1023-1026

Treatment of erosive pustular dermatosis of the scalp: our experience and review of unconventional topical drugs

L. DI BARTOLOMEO[1], I. CERAVOLO[2], F. BORGIA[1], F. VACCARO[3], C. GUARNERI[1], M. VACCARO[1]

[1]Department of Clinical and Experimental Medicine, Section of Dermatology, [2]Department of Biomedical and Dental Sciences and Morphofunctional Imaging, University of Messina, Messina, Italy
[3]Department of Dermatology, University of Modena and Reggio Emilia, Modena, Italy

Abstract. – BACKGROUND: Erosive pustular dermatosis of the scalp (EPDS) is a rare inflammatory disorder of elderly individuals, characterized by relapsing pustular and eroded lesions of the scalp, which may lead to scarring alopecia. Treatment is challenging and classically based on topical and/or oral corticosteroids.

CASE REPORT: From 2008 to 2022, we treated fifteen cases of EPDS. We used mainly topical and systemic steroids with good results. Nevertheless, several non-steroidal topical drugs have been described in literature for the treatment of EPDS. We have carried out a brief review of these treatments.

CONCLUSIONS: Topical calcineurin inhibitors represent a valuable alternative to steroids to avoid skin atrophy. Emerging evidence about other topical treatments, such as calcipotriol, dapsone, zinc oxide, together with photodynamic therapy, are evaluated in our review.

Key Words:
Erosive pustular dermatosis, Topical calcineurin inhibitors, Topical dapsone, Photodynamic therapy.

Introduction

Erosive pustular dermatosis of the scalp (EPDS) is a rare inflammatory disorder of elderly individuals, characterized by chronic, extensive, pustular, eroded, and crusted lesions of the scalp leading to progressive scarring alopecia[1](Figure 1). Although the pathogenesis of the disease remains unclear, EPDS may be the consequence of a local immunologic disorder, which makes skin more reactive to some trigger factors[2].

Local trauma was first proposed as a cause of EPDS, and this may explain a recent case of EPDS following trichotillomania, but other possible triggering factors such as topical drugs and medical and aesthetic procedures have been suggested[2-8].

The course of EPSD is characterized by development of scarring alopecia and frequent recurrences. Therefore, the treatment should be started as early as possible to minimize permanent hair loss whereas maintenance therapy may be considered[9]. Classically, the treatment of EPDS is based on topical and/or oral corticosteroids (TCS), depending on the clinical picture and patient's condition. Nevertheless, prolonged use of TCS may cause skin atrophy, which is a predisposing factor for EPDS.

In the next paragraphs, we report our experience with corticosteroid treatment in seven cases of EPDS and review the literature about the use of non-steroidal topical drugs which may be useful both in inducing remission and as maintenance therapy.

Case Report

From 2008 to 2022, we successfully treated fifteen cases of EPDS with topical and systemic steroids. The patients were of a mean age of 70±12.4 years (range 49-93 years). Five of them had failed previous treatment with topical and systemic antibiotics. In the majority of the cases, we used an association of oral methylprednisolone or prednisone and topical clobetasol propionate (gentamycin-betamethasone cream in one case). In two cases we added oral zinc sulphate. All patients healed completely in 3-8 weeks (Table I summarizes the clinical features of patients).

Topical Calcineurin Inhibitors

Topical calcineurin inhibitors (TCI), namely tacrolimus 0.1% ointment or pimecrolimus 1% cream, have an immunosuppressant local effect,

Corresponding Author: Luca Di Bartolomeo, MD; e-mail: lucadibartolomeo@live.it

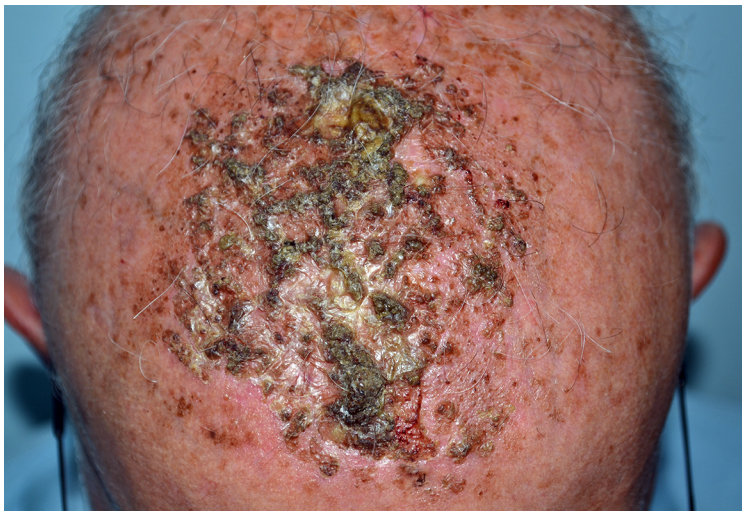

Figure 1. EPDS with pustular, erosive, and crusted lesions of the scalp.

through inhibiting the activation of T cells by calcineurin. According to a recent Australian treatment algorithm, TCI should be preferred to TCS in first-line treatment of EPDS patients with diffuse skin atrophy[9]. TCI may also be considered in association to TCS to improve their effectiveness or in replacement to them when clinical response is not achieved after 8 weeks of steroidal treatment[7]. Moreover, TCI may be successfully used to treat relapses or to prevent them[9,10]. In fact, also in long-term maintenance therapy, TCI do not cause skin atrophy as TCS. For this purpose, Starace et al[10] used topical 0.1% tacrolimus ointment 2 evenings a week.

Calcipotriol

Calcipotriol is a vitamin D_3 analogue which may change the course of EPDS because of its immunomodulating effect and its action on the differentiation of keratinocytes[11]. Calcipotriol for EPDS was first successfully used by Boffa[11]. Subsequently, Pagliarello et al[12] observed that both tacrolimus ointment 0.1% and a combination of calcipotriol 50 µg/g and betamethasone dipropionate 0.5 mg/g ointment did not show significant differences in efficacy but yielding a complete response with different time (3 weeks *vs.* 4 months respectively)[12]. Calcipotriol/bethamethasone as-

Table I. Our EPDS case series from 2008 to 2022.

Age	F/M	Trigger factor	Comorbidity	Previous treatments	Treatment of EPDS	Time to resolution (weeks)
93	F	PDT	AA, AKs	TA + SA	OM + GB cream	7
84	M	IMQ 5%	AA, AKs	TA	OM + CP foam	4
71	M	IMQ 5%	BCC	not	OPe + CP cream	4
75	M	IMQ 3.75%	AKs	not	OM + CP foam	6
63	M	IMQ 3.75%	AKs	not	OM + CP foam	4
74	M	IM 0.015%	AA, AKs	not	OM + CP foam	8
85	M	IM 0.015%	AA, AKs	not	OM + CP foam	8
61	F	LAT 0.1%	AA	TA + SA	OM + CP foam + OZS	6
49	F	LAT 0.1%	AA	not	OM + CP foam	3
57	F	MNX 5%	AA	not	CP foam	6
63	F	MNX 5%	AA	not	OP + CP foam	5
77	F	MNX 5%	AA	TA+SA	CP foam	8
75	F	TOT	seborrhea	not	OM + CP foam + OZS	3
69	F	TTM	depression	not	OP + CP cream	4
53	M	RT	SCC	not	OP + CP cream	4

F: female; M: male; PDT: photodynamic therapy; IMQ: imiquimod; MNX: minoxidil; LAT: latanoprost; IM: ingenol mebutate; TOT: topical oxygen therapy; TTM: trichotillomania; RT: radiotherapy; AA: androgenetic alopecia; AKs: actinic keratosis; BCC: basal cell carcinoma; SCC: squamous cell carcinoma; TA: topical antibiotics; SA: systemic antibiotics; OM: oral methylprednisolone; OP: oral prednisone; CP: clobetasol propionate; OZS: oral zinc sulphate; GB: gentamycin-betamethasone.

sociation has been associated with skin atrophy in long-term treatments, especially on the scalp of elderly patients[12].

Topical Dapsone

The anti-neutrophilic and anti-inflammatory properties of dapsone make it a promising candidate for the treatment of EPDS. Broussard et al[13] obtained complete resolution of EPDS by using topical dapsone 5% gel in four patients who had failed other treatments. Limitations of topical dapsone are related to its low availability in some countries. Severe side effects, such as hemolysis and methemoglobinemia, are generally restricted to oral administration. Broussard et al[13] did not detect hemoglobin levels alteration in their patients. Nevertheless, the Authors declared to not be able to exactly establish the safety of topical dapsone in patients with large open wounds.

Topical Zinc Oxide

Oral zinc supplementation in EPDS treatment is supported by the remission of the disease in some patients with low levels of serum zinc[2]. Recently, Di Altobrando and Tabanelli[14] suggested topical zinc oxide (TZO) as maintenance therapy. After ten days treatment with TCS, they used topical 25% zinc oxide twice daily, achieving complete healing in 4 weeks[14]. TZO may exert anti-inflammatory effects on EPDS. Moreover, it provides a protective medium against bacterial infection and enhances wound healing.

Photodynamic Therapy

The immunomodulatory effects of photodynamic therapy (PDT) may be useful in the control of EPDS, but its use is still controversial. As early as 2009, Guarneri and Vaccaro[3] described PDT as a potential trigger factor for EPDS. In the following years, some Authors reported similar observations while others described good response to PDT exposure[15]. In a case series, Yang et al[15] observed complete resolution of EPDS in eight patients after one to two sessions of aminolevulinic acid PDT[15]. Yang et al[15] did not reported adverse effects in their patients but observed that PDT was also efficient in treating recurrences.

Conclusions

Currently, no international guidelines are available for the treatment of EPDS. TCI may be used in first line as a practical alternative to TCS when avoiding skin atrophy is a priority. Moreover, among topical drugs, TCI appear as the most effective choice to maintain clinical response after cessation of other treatments. Emerging evidence about several topical treatments, such as calcipotriol, topical dapsone, TZO and PDT, have been evaluated in our review, obtaining an overall idea of efficacy with different safety concerns. Larger-scale controlled studies should verify the suitability of these topical treatments in EPDS thus expanding the range of therapeutic alternatives for this rare condition.

Conflict of Interest

The Authors declare that they have no conflict of interests.

Acknowledgements

None.

Informed Consent

Informed consent was obtained from all participants included in the study.

Funding

None to declare.

Data Availability Statement

All data generated or analyzed during this study are included in this published article.

Authors' Contributions

Mario Vaccaro conceived the idea to write a review about the topic. Ida Ceravolo, Federico Vaccaro, and Luca Di Bartolomeo took care of the literature search. Luca Di Bartolomeo and Mario Vaccaro wrote the manuscript. Francesco Borgia and Claudio Guarneri verified the accuracy of all pharmacological information given in the review. Mario Vaccaro contributed to the final manuscript and supervised the project. Francesco Borgia, Federico Vaccaro, Ida Ceravolo and Claudio Guarneri took care of the final form of the manuscript and made changes to adapt the review to journal guidelines. All authors contributed to the article and approved the submitted version.

ORCID ID

Luca Di Bartolomeo: 0000-0002-5457-6246
Ida Ceravolo: 0000-0002-6352-8043
Francesco Borgia: 0000-0003-3515-8441
Federico Vaccaro: 0000-0002-1745-4338
Claudio Guarneri: 0000-0003-3918-8779
Mario Vaccaro: 0000-0003-3787-5145

References

1) Vaccaro M, Guarneri C, Barbuzza O, Guarneri B. Erosive pustular dermatosis of the scalp: an uncommon condition typical of elderly patients. J Am Geriatr Soc 2008; 56: 761-762.
2) Vaccaro M, Barbuzza O, Borgia F, Cannavò SP. Erosive pustular dermatosis of the scalp following topical latanoprost for androgenetic alopecia. Dermatol Ther 2015; 28: 65-67.
3) Guarneri C, Vaccaro M. Erosive pustular dermatosis of the scalp following topical methylaminolaevulinate photodynamic therapy. J Am Acad Dermatol 2009; 60: 521-522.
4) Vaccaro M, Barbuzza O, Guarneri B. Erosive pustular dermatosis of the scalp following treatment with topical imiquimod for actinic keratosis. Arch Dermatol 2009; 145: 1340-1341.
5) Vaccaro M, Borgia F, Gasco L, Cannavò SP. Erosive pustular dermatosis of the scalp following topical ingenol mebutate for actinic keratoses. Dermatol Ther 2017; 30.
6) Guarneri C, Cannavò SP. Erosive pustular dermatosis of the scalp from topical minoxidil 5% solution. Int J Dermatol 2013; 52: 507-509.
7) Vaccaro M, Di Bartolomeo L, Campitiello A, Borgia F. Erosive pustular dermatosis of the scalp following topical oxygen therapy. J Cosmet Dermatol 2022; 21: 403-404.
8) Vaccaro M, DI Bartolomeo L, Guarneri F, Borgia F. Erosive pustular dermatosis of the scalp as local complication of trichotillomania. J Cosmet Dermatol 2022; 21: 4082-4083.
9) Yeh R, Polcz M, Wong D. Erosive pustular dermatosis of the scalp - an Australian perspective: Insights to aid clinical practice. Australas J Dermatol 2019; 60: e272-e278.
10) Starace M, Loi C, Bruni F, Alessandrini A, Misciali C, Patrizi A, Piraccini BM. Erosive pustular dermatosis of the scalp: Clinical, trichoscopic, and histopathologic features of 20 cases. J Am Acad Dermatol 2017; 76: 1109-1114.e2.
11) Boffa MJ. Erosive pustular dermatosis of the scalp successfully treated with calcipotriol cream. Br J Dermatol 2003; 148: 593-595.
12) Pagliarello C, Fabrizi G, Fantini C, Cortelazzi C, Boccaletti V, Annessi G, Zampetti A, Feliciani C, Di Nuzzo S. Calcipotriol/betamethasone dipropionate ointment compared with tacrolimus ointment for the treatment of erosive pustular dermatosis of the scalp: a split-lesion comparison. Eur J Dermatol 2015; 25: 206-208.
13) Broussard KC, Berger TG, Rosenblum M, Murase JE. Erosive pustular dermatosis of the scalp: a review with a focus on dapsone therapy. J Am Acad Dermatol 2012; 66: 680-686.
14) Di Altobrando A, Tabanelli M. Topical zinc oxide: breaking the vicious cycle of erosive pustular dermatosis of the scalp. Int J Dermatol 2021; 61: e216-e217.
15) Yang CS, Kuhn H, Cohen LM, Kroumpouzos G. Aminolevulinic Acid Photodynamic Therapy in the Treatment of Erosive Pustular Dermatosis of the Scalp: A Case Series. JAMA Dermatol 2016; 152: 694-697.