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IMCAS: SHORT PAPER

Breaking paradigms in the treatment of psoriasis: Use of botulinum toxin for the treatment of plaque psoriasis

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Abstract

Some studies have demonstrated that neurotransmitters are involved in the pathogenesis of numerous skin conditions, including psoriasis, addressing the close correlation between the skin and the central nervous system. There are reports showing psoriasis improvement after peripheral nervous system injury. In addition, botulinum toxin has been reported as a treatment for several diseases, including psoriasis. This is a proof-of-concept study of botulinum toxin and psoriasis, involving eight patients with stable and recalcitrant plaques of psoriasis vulgaris. The lesions were 5 cm^2 at the maximum. Botulinum toxin Dysport (Ipsen Biopharm, Wrexham, UK), 5 units per cm^2, was administered in one subcutaneous application. Patients were then evaluated at 2 and 4 weeks after treatment. Our results indicated a substantial improvement in all patients, 4 weeks after treatment, with no significant side effects. Our preliminary conclusion is that botulinum toxin represents a novel mechanism for interfering with the immunopathogenesis of psoriasis and improving the quality of life of our patients.

KEYWORDS

botulinum toxin, psoriasis

1 | INTRODUCTION

Psoriasis is a chronic inflammatory disease characterized by an increased keratinocyte proliferation in response to activation of the immune system through T cells in specific skin locations.

The role of neurocutaneous pathways in the pathogenesis of psoriasis has been suggested based on some reports of dermatomal improvement of plaque psoriasis after injuries that compromised some branches of the peripheral nervous system.[1] In addition, many other investigators have shown that numerous neurotransmitters are involved in the pathogenesis of psoriasis and indicated them as a possible explanation in the relationship between skin and the central nervous system.[2]

There is growing evidence that botulinum neurotoxins (BoNTs) exhibit biological effects on different types of human cells, with a number of associated clinical implications.[3] BoNT applications have been reported for the treatment of numerous dermatological conditions, such as vitiligo, lichen simplex, alopecia areata, itch disorders, hyperhidrosis, anal fissures and psoriasis.[4-6]

Some patients who suffered nerve injury had an improvement in their psoriasis lesions. Recent case reports on the positive effect of BoNT-A injections in patients with psoriasis have promoted this pilot study to prove the hypothesis that BoNTs are effective in psoriasis.[7]

This is a descriptive cross-sectional study with eight patients. The primary objective of the study is to evaluate the effect of BoNT-A on the change of total clinical score (TCS: sum of erythema 0-3, desquamation 0-3 and infiltration 0-3, range 0-9) of skin lesions of patient with plaque psoriasis at week 4. The statistical program SPSS v21 (IBM SPSS Advanced Statistics) was used to carry out the analysis of frequencies and mean differences.

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2 | REPORT

Eight patients with stable plaque psoriasis with some lesions recalcitrant to therapy were enrolled: six patients were only on topical therapy and two patients were on biological therapy. None of the patients discontinued their treatment regimen during the intervention (Table 1). Up to two plaques per patient were selected, whose diameter did not exceed 5 cm^2. Each patient received a single BoNT-A injection (Dysport; Ipsen Biopharm, Wrexham, UK) at a dilution of 5 units per cm^2, with a maximum of 50 units. All psoriasis plaques were measured and photographed (Figure 1). Clinical evaluation, measurement of TCS and a photographic record were carried out at weeks 0, 2 and 4 after the application of BoNT-A.

TABLE 1 Demographic profile of patients

	n
Number of patients	8
Number of plaques included	12
Age, y (range)	50.75 (30-62)
Sex (%)	
Male	87.5
Female	12.5
Ethnicity/race (%)	
Caucasian	62.5
Latino	27.5
Initial TCS (0-9)	8
Topical treatment (%)	75
Systemic treatment (%)	0
Biological treatment (%)	25

Abbreviation: TCS, total clinical score.

3 | RESULTS

Eight patients were enrolled. The mean age was 50.75 years (range 30-62 years), the predominant ethnic group was Caucasian (62.5%) and the initial average TCS was 8 (range 6-11) (P = .590). TCS at 4 weeks was 4.92 (range 3-8) (P = .557). At week 4 after the BoNT-A injection, a difference of 3.083 points (P = .001) was seen in the TCS, demonstrating a statistically significant clinical improvement (Table 2).

All parameters evaluated (desquamation, erythema and infiltration) for TCS showed improvement, but it is worth highlighting the

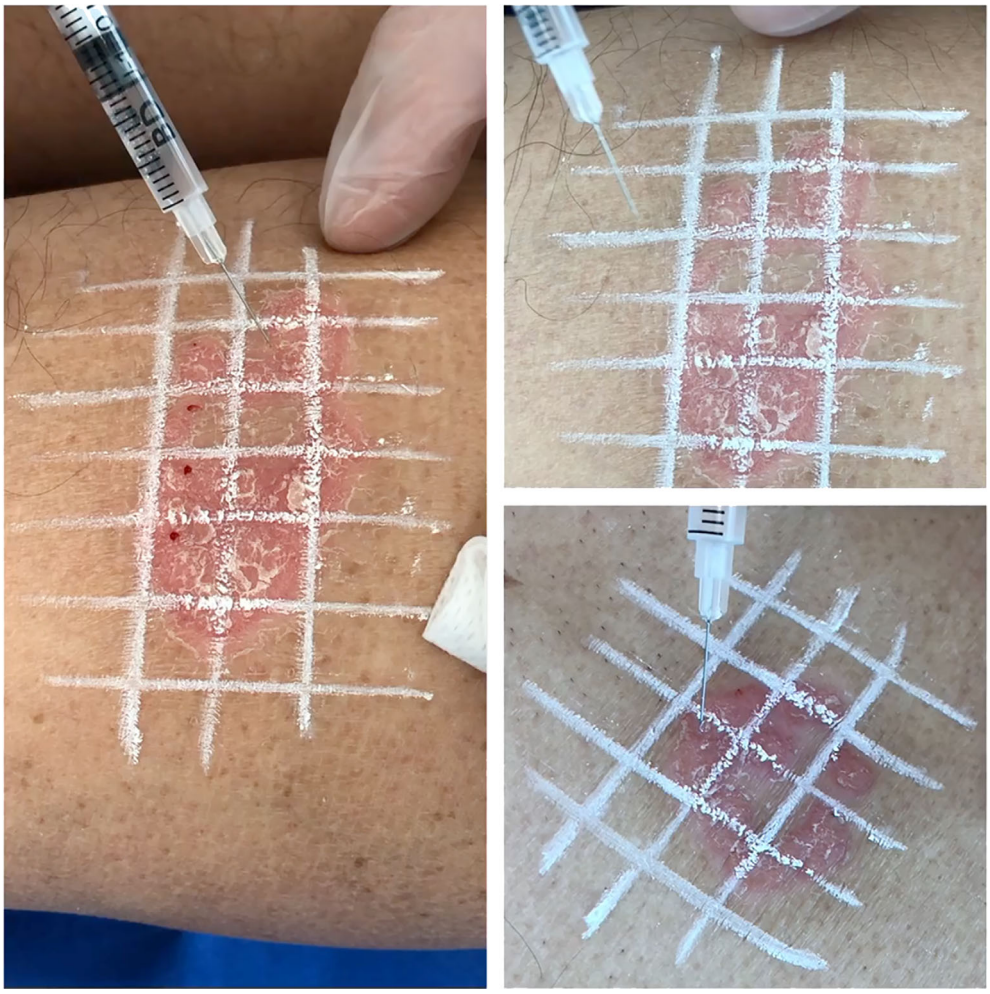

FIGURE 1 Pictures of psoriasis plaques including treatment technique

TABLE 2 Clinical results of the application of BoNT-A

Report								
	Initial TCS	Erythema	Induration	Desquamation	Final TCS	Erythema	Induration	Desquamation
Mean	8.00	2.75	2.50	2.75	4.92	1.75	1.42	1.67
No. of patients	12	12	12	12	12	12	12	12
SD	2.045	0.866	0.674	0.965	1.929	0.754	0.793	0.651

Abbreviations: BoNT-A, botulinum neurotoxin A; TCS, total clinical score.

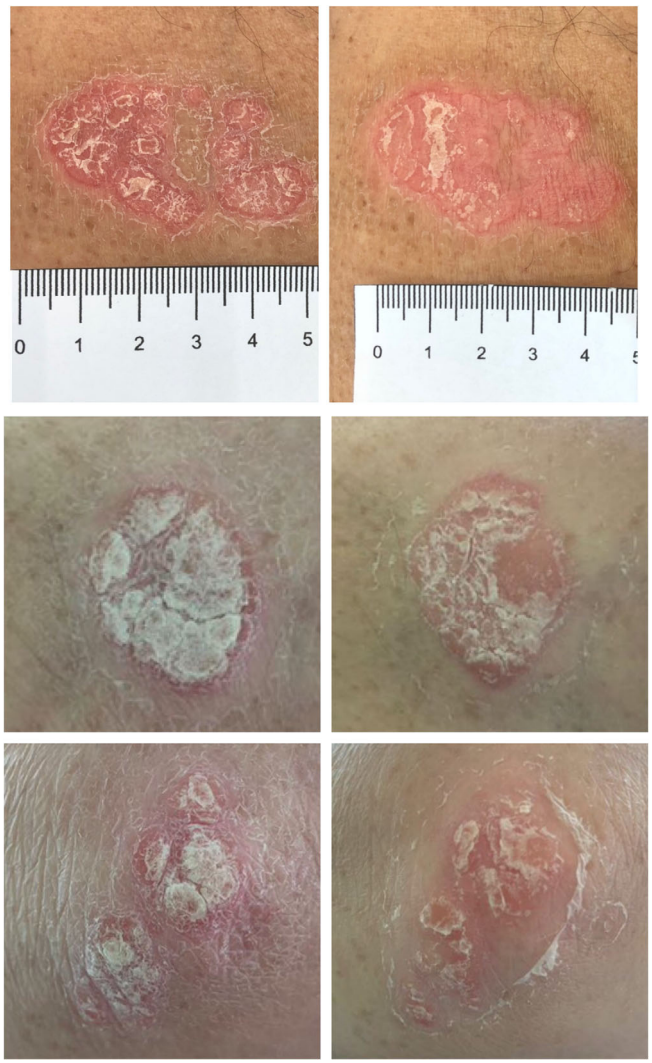

FIGURE 2 Pre- and post-treatment results

improvement in erythema and infiltration of the evaluated lesions (Figure 2 and Table 2).

Two of the eight patients included in the study reported a significant decrease in the pruritus associated with their psoriasis lesions.

No serious adverse events occurred during the study. No adverse events directly related to BoNT were reported, and none of the subjects discontinued their participation during the observation period.

4 | DISCUSSION

Our study showed a significant improvement of 38.5% of mean difference (P = .001) of the TCS following a single dose of BoNT, documented by photographic evaluation. These results are concordant with other studies that have shown an improvement of psoriasis plaques following BoNT injections.[7]

This improvement in recalcitrant psoriasis lesions with a single application of a product with a high safety profile proposes a novel target in psoriasis treatment. Large controlled trials are needed to further assess this potential treatment for recalcitrant plaques of psoriasis.

Even today, with the large number of treatment options available, there are some patients with intolerance, resistance or side effects to some therapeutic agents; thus, new treatment options like BoNTs are required for the optimal management of localized and recalcitrant plaques of the disease.

ACKNOWLEDGMENTS

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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