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SHORT REPORT

Improvement of psoriatic onychodystrophy by a water-soluble nail lacquer

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Abstract

Background There is a strong need for effective products, simple to use and safe for a chronic use in the management of nail psoriasis. Recently, a non-drug, water-soluble nail lacquer became available, containing hydroxypropyl chitosan (HPCH), horsetail extract (Equisetum arvense) and methylsulphonyl-methane (DMSO). This product was effective in strengthening the nails and reducing fragility and roughness in brittle nails. A clinical trial was performed to verify whether this product was able to improve nail psoriatic signs and appearance.

Patients and methods Thirty adult patients affected by mild to moderate symmetric psoriasis of the matrix and/or of the nail bed in at least one fingernail diagnosed more than 6 months before screening and with negative mycology findings were recruited. The nail lacquer was applied once daily on the affected fingernails of the left hand for 24 consecutive weeks. The right hand was used as control. The extent and severity of nail psoriasis was assessed on a target fingernail by means of the recently proposed Nail Psoriasis Severity Index (NAPSI) score. The value at baseline was 2.83 (± 0.99). At the end of treatment, the patients judged the treatment effect and their willing to continue product application. Adverse events were carefully recorded.

Results Overall, 28 patients were included in the efficacy analysis. At the end of treatment, results showed a 72% reduction in pitting, 66% reduction in leukonychia, 63% reduction in onycholysis and a reduction of 65% in NAPSI score compared to baseline, respectively. No changes were observed in the untreated nails.

Patients’ treatment evaluation was classified as very satisfying or good by 78.6% of patients. The acceptability of the treatment was excellent in all patients both for the easiness and for the organoleptic characteristics of the product and 75% of them decided to continue the application after the end of the study. No adverse reactions were reported.

Conclusion In our experience, the new water-soluble nail lacquer proved to be effective in decreasing signs and symptoms of nail dystrophy in psoriatic patients. The effect was particularly evident on NAPSI and on pitting. The product was very well accepted by the patients.

Keywords
hydroxypropyl-chitosan (HPCH), nail lacquer, Nail Psoriasis Severity Index (NAPSI), psoriatic onychodystrophy

Conflict of Interest
None declared.

Introduction
Nail abnormalities are evident in up to 50% of patients with skin psoriasis and may be the first manifestation of the disease in the whole body. The disease can also be limited to the nails, by affecting few or several nails. Diagnostic signs include irregular pitting, salmon patches of the nail bed and onycholysis with erythematous borders. Nail psoriasis may produce also non-specific nail signs such as splinter haemorrhages, nail bed hyperkeratosis, nail thickening, crumbling and leukonychia.1

In most of the patients, nail abnormalities due to psoriasis cause pain and restrictions in daily activities and an improvement in their quality of life is often more important than an objective clinical improvement.2,4

Nail psoriasis is usually difficult to treat due to different factors: the slow growth rate of the nail plate, the difficulty of the topical treatments to penetrate through the nail plate and the long-term treatment necessary for obtaining any clinical benefit. Moreover, the potential toxicity of systemic drugs limits the treatment to patients with extensive disease.3
Thus, there is a strong unsatisfied need for new effective therapeutic agents, simple to use and safe enough to allow chronic use by patients.

The limitation of the topical available treatment (such as calcipotriol, tazarotene and steroids) is that usually they must be applied under an occlusive medication, which is bothersome, time-consuming and applicable only at night. Triamcinolone acetonide could also be injected into the proximal or/and lateral psoriatic nail fold.

Oral treatments such as low dosages of acitretin, methotrexate, cyclosporin A and the new biological agents (infliximab and alefacept) should only be used when nail psoriasis is associated with widespread disease or psoriatic arthritis.

Recently, a new medical device became available on the market, consisting in a non-drug, water-soluble nail lacquer containing hydroxypropyl chitosan (HPCH), which forms a film after application on the nail surface and evaporation of the solvent. Previous clinical investigations\(^1\) put in evidence the properties of the product, and its effectiveness in the management of nail splitting and nail brittleness when regularly applied on damaged nails. As the manifestations of psoriasis in the nails are mostly due to dystrophy of the nail lamina, which renders the nail soft and fragile, a clinical trial was performed to verify whether the strengthening and hardening properties of the HPCH nail lacquer could improve the structure and the appearance of the nail plates after regular application on psoriatic nails.

**Patients and methods**

Thirty adult patients affected by mild to moderate symmetric nail psoriasis of the matrix and/or of the nail bed in at least one fingernail diagnosed more than 6 months before screening and with negative mycology findings were recruited. The patients were assessed by the Investigator every 4 weeks for clinical signs namely pitting, onycholysis and/or leukonychia and for the extent and severity of nail psoriasis on the target fingernail, by means of the Nail Psoriasis Severity Index (NAPSI) score.\(^2\) The NAPSI score at the baseline visit was 2.83 ± 0.99. The nail lacquer was applied once daily on the affected fingernails of the left hand for 24 consecutive weeks. The right hand was used as control. The extent and severity of nail psoriasis was assessed on a target fingernail by means of the recently proposed Nail Psoriasis Severity Index (NAPSI) score. The value at baseline was 2.83 ± 0.99. The nail lacquer was applied once daily on the affected fingernails of the left hand for 24 weeks. The right hand was used as control. The NAPSI score decreased from 2.83 ± 0.99 at baseline to 1.00 ± 1.22 after 24 weeks of treatment. The data are summarized in Fig. 1. The pitting, leukonychia and onycholysis score decreased from 0.97 ± 1.10, 0.29 ± 0.60 and 0.54 ± 0.88 at baseline to 0.27 ± 0.64, 0.10 ± 0.31 and 0.20 ± 0.66 at the end of treatment, respectively. The percent reduction from baseline to end of treatment was 72% for pitting, 66% for leukonychia and 63% for onycholysis.

The global clinical evaluation by the Investigator highlighted that clinical effects started to be evident at the 12-week examination, being evaluated as 'good' in 14 patients (50%). At the end of treatment (24 weeks), the judgement was 'very satisfying' and 'good' in 22 patients (78.5%).

The evaluation of treatment by the patients was very satisfying or good in 22 patients (78.6%) by the end of study.

Individual cases referred to the end of treatment are documented in the pictures presented in Figs 2–4.

The acceptability of the treatment was excellent in all patients both for the treatment easiness and for the organoleptic characteristics of the product, and 21 (75%) of them decided to continue the application after the study end.

The tolerability of the treatment was good in all patients and no adverse reactions were reported.

**Discussion**

Nail psoriasis is difficult to treat because systemic treatments should only be used in moderate to severe cases and topical treatments are not yet available in formulations suitable for long lasting contact with the nail lamina and mostly require occlusive medication, which is bothersome for the patients and suitable only during the night time.
A hardening and strengthening effect of the new medical device consisting in a HPCH nail lacquer had been previously reported in subjects with nail splitting and nail brittleness when regularly applied on damaged nails. In our experience the new HPCH nail lacquer provided a relevant improvement of the nail structure of psoriatic patients affected by onychodystrophy. In particular, the effect was particular evident on the nail psoriatic clinical signs such as pitting, leukonychia and onycholysis as shown by the pictures taken throughout the study.

After a visual inspection, the effect was particularly evident on pitting and on nail fragility as reported by the patients.

HPCH is the film forming agent and allows a long lasting adherence to the nail surface, by penetrating into the unevenness and holes of the nail structure thus decreasing keratin desquamation. Moreover, the nail lacquer is endowed by emollient properties, which may be useful in the local treatment of the psoriatic lesions. Nail psoriasis is often precipitated and worsened by microtraumas due to Koebner phenomenon, and if the nail plate is strengthened and protected, this might be reduced.

References