

Pharmacology and therapeutics

Silk textile with antimicrobial AEM5772/5 (Dermasilk): a pilot study with positive influence on acne vulgaris on the back

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Abstract

Background The use of special silk textiles (Dermasilk) has shown positive effects on chronic inflammatory diseases like lichen sclerosus et atrophicus, atopic dermatitis, diabetic ulcerations, and vulvovaginal candidiasis.

Objective Wearing T-shirts of this particular fabric could be useful in the management of patients with acne vulgaris on the back and trunk.

Material and Methods Dermasilk T-shirts were given to 14 patients with acne vulgaris papulopustulosa on the back. The patients wore these shirts every night for 6 weeks, and their acne lesions were monitored. Dermasilk represents a polymerisate of fibroin, a silk protein, and antimicrobial AEM5772/5, an insoluble colorless, odorless ammonium with antifungal and antibacterial ability.

Results Photographic documentation before and after 6 weeks showed a clinically significant reduction in acne lesions on the back without any concomitant treatment or change in lifestyle and living conditions.

Discussion The use of Dermasilk textiles in other subacute-chronic inflammatory skin diseases has shown positive effects. This is the first report on their safe and effective use in the management of acne vulgaris papulopustulosa corporis.

Introduction

Acne vulgaris is a common skin disease in adolescents and young adults originating from enhanced sebum production, and leading to comedones and secondary inflammation of the pilosebaceous units (hair follicles) in sebaceous areas (face, back, trunk, and shoulders). The incidence of acne may be quoted as 100% of the population; the severity ranges from zero to 100%. Primary lesions (comedones) transform to papules and pustules during the course of the disease. Treatment of acne vulgaris may be challenging and most commonly combines two or more topical and/or systemic options. In mild to moderately severe cases of acne not requiring systemic drugs, local treatment on the back may be frustrating because the local application of topicals cannot be done by the patient him/herself.

There are some reports in the literature showing that the use of a special silk fabric has the ability of reducing the symptoms of chronic inflammatory skin diseases. The fabric (Dermasilk) is made of the silk component fibroin (an insoluble scleroprotein, size 200 kDa, containing glycine 44%, alanine 26%, and serine 13%) attached to an antimicrobial agent AEM5772/5.¹

Previous reports stated positive influence of Dermasilk on the course of disease in genital lichen sclerosus et atrophicus, atopic dermatitis, diabetic ulcers, and vulvovaginal candidiasis.²⁻⁷

As the use of this special silk fabric (Dermasilk) in various chronic inflammatory skin diseases mentioned above has shown positive results, we designed a clinical setting for its use in patients with acne vulgaris papulopustulosa on the back.

Materials and methods

Fourteen patients (5 females, 9 males) with acne vulgaris papulopustulosa on the back were recruited. Inclusion criterion was the presence of mild to moderate acne papulopustulosa lesions on the back without topical or systemic treatment over the minimum of the past 6 months. Everyone received two Dermasilk T-Shirts. Dermasilk represents a polymerisate of fibroin and antimicrobial AEM5772/5, an insoluble colorless, odorless ammonium with antifungal and antibacterial ability. By getting in contact with microorganisms (bacteria, fungi), insoluble AEM5772/5 destroys their outer cellular membranes without poisonous effect on the skin.

All participants were advised to wear the shirts every night for six consecutive weeks. Clinical control visits were held every 2 weeks. Photographic documentation was performed at baseline and at the end of week 6. Standardized questionnaires were filled in for evaluation of the patients' personal experience concerning the fabric, its influence on their everyday life, and its influence on their social contacts. Exclusion criteria were any



Figure 1 (a, b) Acne vulgaris on the back: before and after 6 weeks of nightly wearing of Dermasilk T-shirts.

concomitant systemic or topical treatments of acne and the use of oral contraceptive pills.

Results

Ten patients finished the study. Four of fourteen patients were not compliant and lost to follow-up. The main objective was the clinical outcome of the acne lesions on the back after 6 weeks of wearing Dermasilk T-shirts every night. The evaluation of the clinical photographs taken before and after was performed by an independent dermatologist. Seven of 10 patients (70%, $P = 0.0196$) showed a statistically significant improvement of the skin condition on their back represented by reduction in the number of acne lesions (Fig. 1a,b) without any concomitant treatment.

Secondary endpoints concerning personal impression, severity of suffering, and influence on social life were evaluated by standardized patient questionnaires. The personal assessment of the clinical acne status showed improvement in 80% of patients; 20% realized no change. With regard to the severity of suffering, 50% of the patients stated they were less bothered by acne lesions than before, 40% stated no change, and 10% reported an increase in disturbance even though they did not clearly state why. Concerning their social life, 70% reported less disturbance by acne in social contacts with others, and 30% reported no change (Fig. 2).

Discussion

For various chronic inflammatory skin diseases such as lichen sclerosus et atrophicus, atopic dermatitis, diabetic ulcers, and vulvovaginal candidiasis, the positive influence of Dermasilk

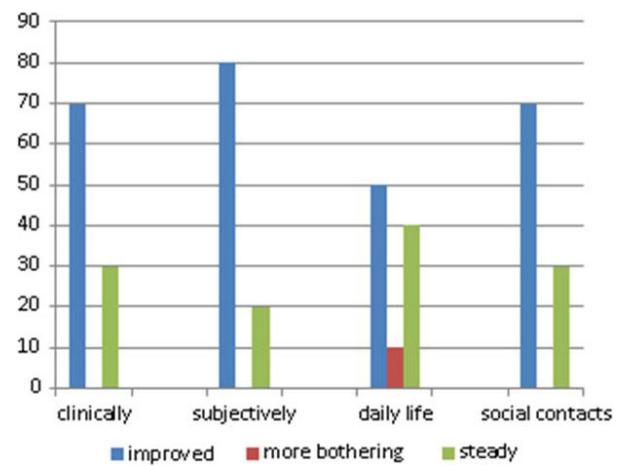


Figure 2 Impact of Dermasilk on acne vulgaris on the back

garments has been reported in the literature: females suffering from genital lichen sclerosus et atrophicus achieved a reduction in itching and disturbing sensations after wearing Dermasilk underwear for several weeks.² In children with atopic dermatitis, Dermasilk underwear could also reduce itching and distress.^{3,4} Moreover, it is stated that the use of Dermasilk products was able to reduce the need for topical corticosteroids in the treatment of atopic dermatitis in children.⁵ In diabetic ulcers, the use of Dermasilk stockings was also quoted positively, as the size of the ulcerations could be reduced in the study.⁶ In a controlled study design, female patients with vulvovaginal candidiasis used Dermasilk underwear. The severity of itching and burning sensations was reduced more in the Dermasilk group than in the control group using underwear made of plain cotton.⁷

This is the first study evaluating Dermasilk products for enhancing the skin condition in acne vulgaris papulopustulosa on the back. Wearing Dermasilk every night for a 6-week period without any concomitant medication – neither topical nor systemic – showed a significant reduction in acne lesions on the backs of 10 patients. Further clinical trials with more than one arm comparing Dermasilk to plain cotton or alternative textiles and including larger numbers of patients are necessary to testify the evidence of these findings.

References

- 1 Mandrioli P. DermaSilk® fabric treated with AEGIS – chemical test. Consiglio nazionale delle Ricerche, Istituto di Scienze dell'Atmosfera e del Clima, Oct. 15, 2003.
- 2 D'Antuono A, Negostani F, Gaspari V, *et al.* Dermasilk: a useful therapeutic aid against lichen sclerosus in women. *J Low Genit Tract Dis* 2011; **15**: 287–291.
- 3 Kernland-Lang K. Practical experience report on the application of DermaSilk on children with atopic dermatitis. Senior Physician and Paediatric Dermatology Consultant, June 2012.
- 4 Koller DY, Halmerbauer G, Böck A, *et al.* Action of a silk fabric treated with AEGIS in children with atopic dermatitis: a 3 month trial. *Pediatr Allergy Immunol* 2007; **18**: 335–338.
- 5 Senti G, Steinman LS, Fischer B, *et al.* Antimicrobial silk clothing in the treatment of atopic dermatitis proves comparable to topical corticosteroid treatment. *Dermatology* 2006; **213**: 228–223.
- 6 Vinci C, Bonollo V. Clinical effectiveness of Dermasilk in the treatment of diabetic ulcers. *Attività Diabetologica a Metabolica in Italia* 2003; **23**: 211–220.
- 7 D'Antuono A, Baldi E, Bellavista S, *et al.* Use of Dermasilk briefs in recurrent vulvovaginal candidosis: safety and effectiveness. *Mycoses* 2012; **55**: 85–89.