The use of a topical compound cream product with chitosan, silver sulfadiazine bentonite hidrogel and lactic acid for the treatment of a patient with rosacea and ulcerated livedoid vasculopathy

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ABSTRACT

Introduction: The aims of this study were to investigate the use of a topical compound cream product with Chitosan, Silver Sulfadiazine, Bentonite hidrogel and Lactic acid for the treatment of a patient with Rosacea and prolonged ulcerated Livedo Vasculitis. Methods: A patient with ulcerated Livedo Vasculitis applied the cream 22 months daily and was examined clinically. Results: At five months the area of the right foot ulcer decreased to a diameter of 18 mm. The pain disappeared (anamnestically) in 7 days around the ulcerated areas reticulated atrophic hipopigmented areas were seen-atrophie blanche and there were still 4 small ulcerations. I noted also the disappearance of the livedoid area from the middle of the second toe finger. The left foot ulcer was epithelised. Wound cultures were negative. After another five months of continues use of the topical cream the situation improves, diameter of the ulcer decreased at 13 mm, the small ulcerations disappeared but continues to stay on the right foot. After another year the situation is stable at the right foot but the left ulcer was partially recurrent and it was painful. Conclusions: The topical compound formula with four active ingredients: Silver sulfadiazine, bentonite hidrogel, chitosan and lactic acid it was a cheap treatment for the patient, it was tolerated without sensitizing even it was used continuously for 22 months.

Key words: Livedoid vasculitis; Chronic ulcer; Topical compound cream; Silver sulfadiazine; Chitosan; Bentonite

INTRODUCTION

Livedoid vasculopathy is a disease of the lower legs with painful chronic ulcerations and cutaneous atrophy blanche located particularly around the malleoli and commonly seen on adult women. We present a case of a 39 years old man with Rosacea and dorsoplantar chronic and painful ulcerations known with the disease and referred to me for a topical treatment as he was partially refractory to systemic therapies and also to local ones. We used a compound topical cream product which contains chitosan, argentie sulfadiazine, bentonite and lactic acid with good result and tolerance. The ulceration decreased and the pain was disappeared.

CASE REPORT

A 39 years old man was referred to my Private Practice from the Vascular Surgery unit with a long history -7 years- of painful ulcerations on the dorsoplantar areas and sometime around maleoli. The patient was previously consulted those years by dermatologists, vascular surgeons, internists and the Diagnosis of livedoid vasculopathy was established before but now he said is the most painful period and he needed help for the wound to heal. The patients history reveals Rosacea and hypercholesterolemia. Previously he was treated in time with low –dose aspirin, dipryidamole, pentoxyphylline, fraxiparine. At the time of the referral he was on treatment with rosuvastatin 20mg daily and clopidogrel 75 mg daily, he used topically...
on ulcers silver dressings and for the face metronidazole cream. He had no history of smoking or of thrombosis and no varicous visible veins. Physical examination revealed one large (66mm of diameter) painful ulceration on dorsoplantar area of the right foot, with some edema and circular erythema around it and also a livedoid area on the second toe finger (Fig. 1). On the surface of the ulcer there was a detritus with the rest of previous treatments, pus and scales. The second ulceration was in perimaleolar area of the foot (8 mm of diameter) (Fig. 2). Wound cultures from both ulcers showed *Klebsiella* with maximum sensitivity to Cefixime. Venous ultrasound was normal.

He had two previous biopsys consistent with stasis, fibrosis, hyalinization of the vessels, the PAS (Periodic Acid Schiff) taining was negative, thrombosis of the superficial vessels, red blood cell extravasation suggesting the diagnosis of livedoid vasculopathy. The tests for Protein C, Protein S, homocysteine, antithrombine III, Lupusanticoagulant, Cryoglobulines, Cholesterol, Anticardiolipine, antibodies, anti –double-stranded DNA antibodies, complement, prothrombin time/ partial thromboplastin time, aspartate aminotransferase/ alanine aminotransferase, were within normal limits or negative [1]. The Erythrocyte sedimentation rate was elevated at 42 mm/hr.

We added at his previous treatment Cefixime 400 mg daily for 10 days and after the informed consent was signed and the Institutional Review board approval was taken, we advise the patient to apply once a day a combination product containing chitosan, argentsulfadiazine, bentonite and lactic acid (Cicatrol, Antibiotic, Romania). At five months the area of the right foot ulcer decreased and there were still 4 ulcers but just one with a diameter of 16mm. The pain disappeared (anamnestically) in 7 days –so it was maybe due to infection. Around the ulcerated areas reticulated atrophic hypopigmented areas were seen-atrophied blanche (Fig. 3). We noted also the disappearance of the livedoid area from the middle of the second toe finger. The perimaleolar foot ulcer was epithelized (Fig. 4). Wound cultures were negative. After another five months of continuous use of the topical cream the situation improves, the other three small ulcerations disappeared, the big one diminished at 12 mm but continues to stay on the right foot (Fig. 5).

**DISCUSSIONS**

Livedoid vasculopathy is a disease of the lower legs with painful chronic ulcerations and cutaneous atrophy blanche, it is hard to manage due to the resistance at topical and internal treatments and its potential to complicate with infections. Topical creams has
sensitizing potential when used for long periods of time. The topical cream formula contains four active ingredients: Silversulfadiazine, bentonitehidrogel, chitosan and lactic acid.

Silver is used to reduce infections from ancient times. The use of silver impregnated dressings after laminectomies appear to limit/reduce the incidence of both postoperative deep and superficial wound infections [2]. The wide spectrum of antibacterial activity the low toxicity, minimal tissue reaction, ease of application suggest that topical silver sulfadiazine can safely be used in burns, surgical wounds and can be extended to other wound infections, wound covers and some transplant materials [3]. At the contact with the bacteria cell Ag + penetrates the bacterial membrane and stop the DNA synthesis so the bacteria cannot divide so it dies. Due to his redox potential Ag + dissociate after the bacterial destruction and acts in a bactericide manner ensuring a cyclic process. Silver sulfadiazine have excellent anti-bacterial activity and could be used initially while the identification of the infective agent is required for selecting the alternative topical agents and/or systemic therapy [4]. The second ingredient, bentonite is a clay which by absorbing or adsorbing moisture and impurities from the skin serve to cleanse and to refresh the surface of the skin surface and to aid the healing process. External use of Bentonite for wound healing is safe and feasible and the macroscopic healing of the wounds treated by Bentonite was superior versus control group [5]. The third ingredient is Chitosan- a polysaccharide obtained from crustaceans and with a regenerative effect on skin. Chitosan is a linear copolymer of B linked 2-acetamido-2 deoxy-B-D-glucopyranose and 2-amino-2-deoxy-B-D-glucopyranose, easily obtained by deacetylation of chitin, an abundant polysaccharide found in nature as a component of exoskeletons of crustaceans and insects. Topically used Chitosan bind on fibroblasts and stimulates the keratinocite proliferation and the repair of the epiderm [6]. Since its discovery approximately 220 years ago, Chitosan as a cationic natural polymer has been used as topical dressing in wound management owing to its hemostatic, stimulation of healing, antimicrobial, nontoxic, biocompatible and biodegradable properties [7]. It stimulates the imunocites and also leucocites, macrophages and fibroblasts [8], bloks nerve endings to reduce pain, absorb fluids from inflammation, encourages natural blood clotting, forms barrier against infection, provides proteins for healing and scaffold for cell growth, minimizes scarring [9].

The protection of the host against bacterial infection is stimulated by chitosan. The effectiveness of chitosan bacteriastatic properties were tested against bacterial strains and a common skin fungus. Powered chitin, chitosan or whole crab shells were not effective in any of the tests, but solution of chitosan in acetic acid inhibited the bacterial strains and the fungus. The mechanism underlying the inhibition of bacterial growth, is thought to be that the cationically charged amino-group may combine with anionic components such as N-acetylmuramic acid, sialic acid and neuraminic acid, on the cell surface, and may suppress bacterial growth by impairing the exchanges with the medium, chelating transition metal ions and inhibiting enzymes. Chitosan is characterized by high antibacterial and fungicidal activities [10]. The lactic acid is known as a antiwrinkle agent,helps

Figure 4: Perimaleolar ulcer is epithelised after 5 months.

Figure 5: The dorsoplantar ulceration after 10 months.
to the renewing of epiderma, stimulates the colagen
synthesis, ceramides and epidermal growing factor [11].

The associated Rosacea was not influenced by the
evolution of the ulcers and i didn't find in literature
the association with livedoid vasculopathy.

CONCLUSIONS

Livedoid vasculopathy is a disease of the lower legs
with painful chronic ulcerations and cutaneous atrophy
blanche. livedoid vasculopathy is a coagulation disorder.
As a result, modern therapy strategies take into account
to treat it with systemic anticoagulation. Topical
therapies may be considered only as accompanying
measures but very important.

It is hard to manage due to the resistance at topical
and internal treatments-fibrinolitics, anticoagulants,
anti-platelet agregants- and due it is potential to
complicate with infections. Topical creams has
sensitizing potential when used for long periods of
time. The topical compound formula with four active
ingredients: Silver sulfadiazine, bentonite hidrogel,
chitosan and lactic acid it was a cheap treatment for
the patient, it was tolerated without sensitizing even
it was used continuously for 10 months. Unfortunately
one ulcer didn’t close completely. Our experience was
limited to one case of livedoid vasculopathy and of
course more studies should be done in the future on
this field.

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Consent

The examination of the patient was conducted
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