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Severe Irritant Contact Dermatitis of the Face: New Natural Approaches in the Topical Treatment

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ABSTRACT

Contact dermatitis is a common skin condition characterized by inflammation, be it acute or chronic, occurring as a result of interaction with irritant substances. It can be categorized as either irritant contact dermatitis (ICD) or allergic contact dermatitis (ACD). Contact dermatitis is currently one of the most common occupational diseases, with capability of involving any given part of skin and a predilection for the face and extremities. Irritant-contact dermatitis represents the majority of cases (around 80%), while the remaining instances are caused by interaction with allergens. Nonetheless, correctly diagnosing and treating forms of ICD remains difficult, with treatments for contact dermatitis currently based on the identification and avoidance of the underlying cause, along with the use of topical steroids and emollients, with creams frequently recommended in preventative skin care programs for the workplace.

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Introduction

Contact dermatitis is a common skin condition characterized by inflammation, be it acute or chronic, occurring as a result of interaction with irritant substances. It can be categorized as either irritant contact dermatitis (ICD) or allergic contact dermatitis (ACD). In ICD, chronic epithelial injury from repetitive exposure to weak irritants triggers the innate immune response with release of proinflammatory cytokines including IL-1α, IL-1β, IL-6, IL-8, TNF-α and GM-CSF from the keratinocytes. These cytokines then activate Langerhans cells, dermal dendritic cells, and endothelial cells, which cause the recruitment of neutrophils, lymphocytes, macrophages, and mast cells to the epidermis which causes further inflammation. In ACD various allergens can instead induce a Type IV hypersensitivity immune response. [1]. While both acute and chronic forms tend to display pruritus among their main symptoms, acute contact dermatitis is commonly associated with manifestations including erythema and vesiculation, whereas chronic forms are mainly defined by xerosis, lichenification and fissures. Acute irritant forms of contact dermatitis are frequently caused by single episodes of exposure to strong irritants or caustics, with lesions rapidly developing in, and remaining confined to, areas of direct exposure. Upon close inspection, the skin usually appears erythematous with xerosis, fissures and, sometimes, a fine lamellar desquamation. Although manifestations may vary based on individual factors, this is the most common presentation in "wet workers" due to prolonged occlusion by gloves or contact with detergents. In chronic forms, this condition can also cause damage to the nail system with onycholysis and the appearance of longitudinal striae [2]. Contact dermatitis is currently one of the most common occupational diseases, with capability of involving any given part of skin and a predilection for the face and extremities. Irritant-contact dermatitis represents the majority of cases (around 80%), while the remaining instances are caused by interaction with allergens [3]. The development of contact dermatitis in any given individual can be influenced by extrinsic (such as occupation, environment and culture) and intrinsic (like age, sex, genetics) factors, with higher prevalence in adults more than children and in women more than men. The disease is significantly linked with decreases in quality of life for sufferers, carrying profound impact on social and occupational facets of life and representing a substantial burden for healthcare systems. ICD is typically a diagnosis of exclusion, thus it is important to exclude both type I and type IV reactions before formulating a diagnosis of ICD, especially in an occupational setting. Skin biopsy is of limited value in diagnosing contact dermatitis, with the histology of ICD being very different from ACD when biopsies are taken during the first day or two following exposure [4]. Nonetheless, correctly diagnosing and treating forms of ICD remains difficult, with treatments for contact dermatitis currently based on the identification and avoidance of the underlying cause, along with the use of topical steroids and emollients, with creams frequently recommended in preventative skin care programs for the workplace. Moisturizers or emollients are a treatment that prevents loss of skin water, thus reducing skin dryness, decreasing TEWL, improving comfort and reducing itch. Their regular use makes the skin less sensitive and irritated and reduces the recurrence of contact dermatitis, with a net advantage of reducing the need for topical corticosteroid application. However,

although frequent moisturizing might prove sufficient in controlling mild eczema on its own, management strategies for severe forms of eczema always include both active treatments that address the inflammatory lesions (such as topical corticosteroids) and adjunctive therapies (like emollients) to optimize skin barrier function and prevent flare-ups. To this day severe eczema remains difficult to treat and some of the treatments offered can be problematic and associated with adverse side effects. In this article we present 6 cases of patients treated for severe forms of contact dermatitis with a non-steroid cream that protects the skin from infections while aiding in its restoration to a healthy state, thanks to the combined action of Rigenase® and polyhexanide [5,6]. Rigenase® is derived from Triticum vulgare Extract (ETV) seeds, and has demonstrated a wide variety of positive effects, ranging from boosted fibroblast and cheratinocyte proliferation (with significant stimulation of HAS2 fibronectin, actin, integrin, elastin and collagen type 1) to anti-inflammatory and antioxidant activity, thanks to reduced expression of pro-inflammatory cytokines like IL-6 and TNFalfa [7]. Polyhexanide is a synthetic polymer, structurally similar to antimicrobic peptides (AMP) with bacteriostatic/bactericidal action against a host of bacteria including S.aureus (even MRSA), P. aeruginosa, K. Pneumoniae and C.albicans, among others [8]. The combined action of Rigenase® and polyhexanide proves most efficacious in aiding restoration of acute superficial skin lesions, especially if fibrin is present, contrasting bacterial infections while favoring re-epithelialization, all while remaining easy for patients to apply and to use [9]. The primary objective of the present study is to prove that use of the Rigenase® and polyhexanide cream can lead to reduction in usage of topical drugs, by establishing therapeutic plans based on severity of disease, thereby increasing patient compliance to treatment.

Materials and Methods

The study was conducted in Italy between October 2022 and January 2023; we analyzed 6 patients of both sexes, 1 male and 5 females, between the ages of 24 and 65, all suffering from severe irritant contact dermatitis as diagnosed by accredited dermatologists. Extension, type and intensity of manifestations were evaluated with a personal score, which assigned points from 0 to 3, based on severity, for every clinical sign (table 1). Two of the subjects were suffering from atopic dermatitis. The patient in fig. 1 through 3 came to us after having used a retinol based cream, whereas the patient in fig. 4 through 6 had developed ICD lesions after having used an urea cream. Patch testing (SIDAPA series) has been administered to all the patients, being applied and subsequently removed after 48 hours to analyze the results, which were checked again after 96 hours to exclude pre-existent forms of allergic contact dermatitis. Patch tests for all patients resulted negative, thus confirming that ICD was indeed the correct diagnosis. All patients have been treated in accordance with the latest Italian guidelines [10]. For non-Atopic subjects we used fusidic acid for a week and the Rigenase® and polyhexanide emollient, applied once daily for the duration of the pharmacological therapy, then twice daily for at least 2 weeks. Atopic subjects were, instead, treated with a combination of fusidic acid and betamethasone valerate, while following the same protocol as non-atopic patients with regards to emollient application. Patient characteristics of the study population and product used are reported in table 2. We followed subjects over the course of one month, taking pictures of their progression, all showing marked improvement and, in most cases, complete resolution of symptoms as exemplified by fig. 1 through 3 and 4 through 6. All pictures and relative updates were taken at day 1, 7 and 21 of treatment.

Table 1: Personal Score

Intensity of Lesions
Clinical Signs
Erythema
Edema
Crusts
Vesciculation
Desquamation
Dryness
0: absent
1: mild
2:moderate
3: severe

Table 2: Patient Characteristics of The Study Population

Patient number	Sex	Age	Profession	Product used
1	F	40	Office worker	Retinoid-based cream
2	F	24	Student	Blemish balm cream
3	F	31	Clerk	Anti-spot serum
4	M	57	Professional Chef	Actinic keratosis prevention cream
5	F	65	Housewife	Anti-age cream
6	F	37	Office worker	10% Urea cream

Results

After 21 days all our patients reached satisfactory results, with 100% achieving complete resolution and a 0 on our personal score. The Two patients in figures 1-6 both worked as office employees, whereas of the four remaining subjects, one worked as a cook, one as a physiotherapist, one as a child nurse and one was a housewife. All patients were compliant to the treatment and reported no unwanted side effects, with none dropping out of the study. Treatment with the Rigenase® and polyhexanide emollient proved itself to be effective in not only maintaining, but also actively aiding the recovery of areas of skin affected by ICD.

Discussion

Contact dermatitis is an inflammatory skin disease caused by contact with either numerous irritants, or small reactive chemicals (contact allergens) that modify proteins and induce immune responses. Thus, it can manifest as irritant (ICD) or allergic (ACD), which may occur in acute or chronic forms. Contact dermatitis accounts for 95% of all occupational skin diseases, with ICD constituting 80% of all contact dermatitis cases. ICD is characterized by direct damage to the epidermal cells of the skin that triggers the innate immune system, resulting in an inflammatory skin response to various external stimuli. While ACD is a delayed hypersensitivity reaction (type IV) to allergens, ICD does not require prior exposure (sensitization), with most individuals exposed to such (usually aggressive) substances manifesting similar reactions. In our study, we evaluated the efficacy of Rigenase® and polyhexanide cream in addition to standard treatment for ICD cases, in both atopic and non-atopic subjects, following the current Italian guidelines. Treatment with Rigenase® and polyhexanide boosted the efficacy of pharmacological therapy and provided protection from infection while decreasing inflammation. Therefore, we conclude that

Rigenase and polyhexanide represent a valid addition to the therapeutic arsenal of ICD treatment, with it not just promoting, but actively aiding in maintaining remission.

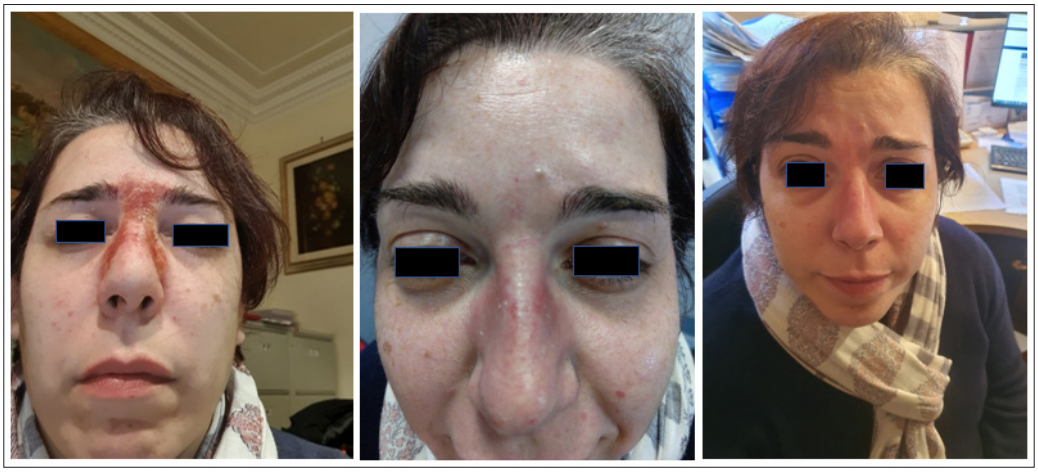

Figure 1-3: Progression of an atopic patient at days 1, 14 and 21 respectively

Figure 4-6: Progression of a non-atopic patient at days 1, 14 and 21 respectively.

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