Treatment of Dermatitis with NCCO Invisible Gloves

Professor Ezra Kwok[1] PhD PEng MD CCFP FCFP FEC
Department of Chemical and Biological Engineering
The University of British Columbia
Vancouver, British Columbia, Canada

Abstract

Atopic dermatitis (eczema), allergic contact dermatitis, and irritant contact dermatitis are all common forms of Dermatitis. The typical treatment includes both steroid and immune-modulator topical agents. This article presents two cases of dermatitis which do not respond well to the typical topical agents. Instead, the non-prescription NCCO-IG topical cream which forms a nanostructured membrane on skin surface is a promising alternative medical agent to the traditional prescription topical agents.

Introduction

Dermatitis is a general term for inflammation of the dermis regardless of the etiology. It can be understood as a skin irritation caused by certain, sometimes unknown, factors. Dermatitis is a common condition in our population. It can be presented in many forms. Examples of this condition are atopic dermatitis (eczema), dyshidrotic eczema, allergic contact dermatitis, and irritant contact dermatitis. The common presentations usually include dryness, flakiness, thickening, crusting, scaling, swelling, and reddening. In some extreme cases, painful skin cracks, oozing fluid and even infection may develop.

Atopic dermatitis or commonly known as eczema is the combination of a genetic predisposition for skin barrier dysfunction and dysfunctional innate and adaptive immune responses. It is a chronic condition that can lead to higher frequency of bacterial and viral skin infections. Even when skin appears clear, inflammation is still active under the skin.

Dyshidrotic eczema is a unique condition that produces tiny, itchy blisters most commonly on the edges of the fingers, toes, palms and soles of the feet. These blisters together with some of the common presentations described earlier are pathognomonic for the diagnosis of dyshidrotic eczema. The term “dyshidrotic” means “difficult sweating” which once thought to be the cause of this condition. Although the actual etiology is still unknown, stress, allergies, sweaty hands and feet, or exposure to certain chemicals or minerals may trigger or exacerbate this type of eczema. It is more prevalent in young women aged 20 to 40.

[1]To whom all correspondence should be addressed. Email: ezra.kwok@ubc.ca

Allergic contact dermatitis occurs when the skin comes in contact with a substance that triggers an allergic reaction. Often times, the allergic reaction is delayed or requires multiple episodes of exposure before the skin manifests the common presentations described above. Irritant contact dermatitis is an injury to the skin's surface such as frequent washing, use of alcohol-based sanitizer or handling of chemicals. The natural protective layer of skin is removed by the offending agent which exposes the deeper and more delicate skin layers to further damage.

In this Case Report, three patients with chronic and severe dermatitis are presented for review. Even though the identities of these three patients are not disclosed, written consents for the use of their histories and pictures have been obtained from the patients and the teenager's guardian. All have been treated with topical steroid and/or non-steroid medications with only limited success. Some topical medications even caused further irritation to their skin. The NCCO-IG non-steroid non-prescription cream was introduced to them. Details of the cases are described below:

Case 1

The patient is a 12-year old Asian teenager. He is overall healthy with no history of any health issues except atopic dermatitis. Because of the genetic predisposition and immune system dysfunction, his skin often develops moderately severe dryness, thickening, and skin cracks. He would feel stiffening in his skin even when the skin was not inflamed. During active inflammation, he would experience tearing pain and itchiness that would often respond only to potent topical steroids such as Betamethasone Dipropionate or Mometasone in ointment. The ointment base gave him some relief but it also came with a stickiness on the skin that was unpleasant especially during hotter weather. Figure 1 shows his typical skin condition even after prolonged use of topical steroids. Dryness, skin thickening, flakiness and skin cracks were still visible especially around his mouth. He was introduced to the topical non-steroid NCCO-IG cream. After two days of application, his skin inflammation began to calm down. There was clear improvement in the skin texture and thickening. Skin flakiness and crack reduced significantly. After a week of NCCO-IG application without the use of any prescription topical agent, his skin shown in Figure 2 improved dramatically. He also reported less skin stiffness. An additional benefit is an increase in his self-esteem and confidence due to his much-improved facial appearance.

Figure 1: Patient's face before use of NCCO-IG

Figure 2: Patient's face after use of NCCO-IG

Case 2

The second case presents a young lady around 30 years old. She works as a Project Manager for a commercial building construction company. Her job has been challenging. She is required to visit different construction sites. She has no known medical issues, and no drug or environmental allergy. Because of the pandemic and meetings with different people, she had been very diligent with maintaining hand hygiene by frequently using alcohol-based hand sanitizers throughout the day. After a short time, her hands developed significant dryness, skin thickening, erythema and itch. She initially thought that it was just dryness from frequent washing. Her condition became worse. She noticed some tiny blisters forming along the side of her right-hand fingers. The blisters slowly spread to her right palms and developed intense itch which even woke her up from sleep. After a visit to her doctor, she was diagnosed with dyshidrotic eczema. She was prescribed a potent topical corticosteroid cream. Unfortunately, after one week of corticosteroid treatment, there was minimal improvement only. Her right palm turned red. She also noticed more tiny blisters forming in her left palm as well. Figure 3 shows her hand conditions after corticosteroid treatment.

Figure 3: Patient's palms before use of NCCO-IG

Because of the intense itch, the eczematous blisters were mostly excoriated. She reported that those tiny craters felt like active volcanos causing significant burning sensation when she used alcohol-based sanitizers. As her condition became worse, she was introduced to NCCO-IG as an alternative and reported significant difference. First, she did not experience any burning sensation when using this NCCO-IG as a hand sanitizer. Second, after one week, the tiny blisters reduced by half and her skin dryness also resolved. Third, after a few more weeks, her dyshidrotic eczema completely resolved with no more blisters, itch, or skin dryness. Figure 4 shows her hand conditions after the use of NCCO-IG.

Figure 4: Patient's face after use of NCCO-IG

Case 3

The patient is a 60-year old Asian car salesman. He has a history of hypertension dyslipidemia, and premature ventricular complex. He has no history diabetes, seasonal allergy, or congenital skin disease. His current medication includes only Diltiazem and Rosuvastatin. Because of his job nature, he requires frequent use of car cleaning products and is exposed to increased levels of allergens such as volatile organic compounds. For over a decade, he has been suffering from irritant contact dermatitis. One of his worst episodes is when he had a major flare-up of skin inflammation after frequent use of alcohol-based hand sanitizers during the Covid-19 pandemic. He was prescribed different steroid-based compounds. He was even prescribed the non-steroid immune modulators. Unfortunately, he continued to experience painful skin cracks, skin thinning, and burning sensation. Figure 5 shows the picture of the patient's finger in its best condition after use of potent steroid ointment. NCCO-IG was recommended to him as a regular skin cream. After a day of regular application without use of any prescription topical medication, his finger skin condition improved further as shown in figure 6.

Figure 5: Patient's finger before use of NCCO-IG.

Figure 6: Patient's finger after use of NCCO-IG

Discussion

NCCO-IG is a non-alcohol and non-steroid cream formulation which has been certified by internationally-recognized microbiology laboratories to have antimicrobial properties achieving more than 99.99% disinfection power. It forms a nano-hydrous membrane which extracts water molecules from its surrounding including micro-organisms and locks the water molecules within the membrane. It is believed that the nanostructured

membrane prevents skin dryness and damage by rehydrating and replenishing the skin barrier. Because both irritant contact dermatitis and eczema cause damage to the skin's natural protective layers, NCCO-IG's nanostructured membrane acts as a temporary natural protective layer. The protection prevents further trauma to the deeper dermal layer while allowing the outer layer to repair itself. The antimicrobial property of NCCO-IG likely reduces further skin irritation and/or infection commonly present in chronic eczema patients. It is not known if the nanostructure membrane has any impact on the underlying inflammatory condition in atopic dermatitis.

Conclusion

Even though NCCO-IG cream is a non-prescription topical skin care product, multiple case reports have clinically supported that NCCO-IG offers therapeutic benefits. Randomized double-blinded controlled studies are typically the standard method for evaluating medications. However, this standard method cannot be conducted with topical agents because of the difficulty of double-blinding and quantification of skin improvement. Therefore, the case reports such as the ones presented in this article serve as medical evidence to support the therapeutic property of NCCO-IG in the treatment of dermatitis.

Author's biography

Dr. Ezra Kwok is currently Adjunct Professor of Chemical and Biological Engineering at the University of British Columbia and a practicing physician at two medical centers in Vancouver/Richmond. In his former role as tenured Professor of Chemical & Biological Engineering at The University of British Columbia (UBC), Dr. Kwok founded the graduate-level Biomedical Engineering Program at UBC where he also served as its inaugural Program Director from 2005 to 2010. After 23 years of teaching and research in Biomedical Engineering, he stepped down from his UBC tenured professorship in 2017 but maintains his academic activities as an Adjunct Professor. Dr. Kwok is also a Professional Engineer and serves as a Board Examiner in Biomedical Engineering for Engineers and Geoscientists British Columbia. Outside of his academic and business interests, Dr. Kwok co-founded a medical and surgical practice group in Vancouver where he continues to practice as a primary care physician on a part-time basis, as well as being a medical advisor for the Worker's Compensation Board of British Columbia.

Dr. Kwok's professional background is complemented by extensive academic training from several of Canada's leading universities. He graduated with distinction with a degree in Chemical Engineering and completed his PhD in Computer Process Control from the University of Alberta; he holds a MD degree from McMaster University and completed his residency in Family Medicine at UBC. In 2012, he was named Outstanding Canadian Biomedical Engineer by the Canadian Medical and Biological Engineering Society. At the Silver Jubilee Western Canada Technical Excellence Conference in 2016, Dr. Kwok received the "Distinguished WesTEC Award – External Leader in Science and Technology" from Dow Chemical Canada in recognition of lifelong achievements in science and technology, and commitment to advance various aspects of science, education and research. In recognition of his commitment and contributions to his professions, Dr. Kwok was bestowed with the honor of Fellow of the College of Family Physicians of Canada in 2017 and Fellow of Engineers Canada in 2019.

Dr. Kwok's research interests include diabetic modeling and control, advanced process control, osteoarthritic synovial fluid properties, in-door air quality control, medical management of diabetes mellitus and osteoarthritis, and medical engineering technology. He has published over 50 refereed scientific papers in international journals.