Ichthyosiform Irritant Contact Dermatitis Caused by Antiseptics for Personal Hygiene

Yi-Pei Lee  Julia Yu-Yun Lee

**Background:** Antiseptics are commonly used for personal hygiene in Taiwan. We have previously reported a series of ichthyosiform irritant contact dermatitis induced by cetrimide-containing antiseptics.

**Objectives:** To report a new series of antiseptics-induced ichthyosiform irritant contact dermatitis and bring attention to the potential irritation effects of antiseptics.

**Methods:** We reviewed the clinicopathologic features of cases of cetrimide dermatitis, Savlon dermatitis or ichthyosiform irritant contact dermatitis diagnosed in our department (October 1993-August 2008). Cases with characteristic ichthyosiform, scarlet to dusky red or chemical burn-like skin lesions, primarily affecting the flexures and/or genital areas, and relevant exposure histories were included.

**Results:** There were 35 patients (14 men and 21 women), aged from 3 to 79 years (mean 45 years). Most patients were seen in summer with a recognizable underlying pruritic dermatosis, and had used commercial products containing cetrimide. The exposure time was from 4 days to 2 months (mean 3.4 weeks). The great majority (80%) had moderate or severe skin lesions characterized by scarlet to dusky red or brownish lesions with a collodion membrane-like surface, and showed a preferential involvement of the flexural and genital areas, especially the groin and axilla where the lesions often manifested centrifugal rings. In no case was antiseptics-related dermatitis suspected by the clinicians or the patients. Skin biopsy was performed in 5 patients; all revealed changes consistent with cetrimide ichthyosiform irritant contact dermatitis.

**Conclusions:** Our study showed that self-application of cetrimide-containing antiseptics is still an important cause of irritant contact dermatitis in southern Taiwan. This dermatitis should be differentiated from ichthyosis, tinea circinata, erythema annulare centrifugum, and nutritional deficiency diseases. Recognition of the clinical characteristics can prompt clinicians to inquire about exposure to antiseptics and facilitate correct diagnosis. (Dermatol Sinica 27: 218-226, 2009)

*Key words: Antiseptics, Cetrimide, Ichthyosis-like, Irritant contact dermatitis, Personal hygiene*

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INTRODUCTION

It is well known that antiseptics may cause various types of allergic and irritant contact dermatitis affecting various parts of the body depending on the mode and site of exposure. Antiseptics are commonly used for personal hygiene in Taiwan. Cetrimide, a mixture of quaternary ammonium compound and a known irritant, is a common ingredient in antiseptics. Contact dermatitis caused by cetrimide-containing antiseptics has been documented in a few reports. We have previously reported a series of 18 cases of cetrimide-induced ichthyosiform irritant contact dermatitis (ICD) (cetrimide dermatitis) to bring attention to the potential irritation effects of cetrimide. In that series, the rash varies from ichthyosis-like lesions with little or no erythema to dusky red and chemical burn-like plaques. The flexural and genital areas are preferentially affected. Most patients applied without proper dilution and developed the pruritic and/or painful rash after 1 to 4 weeks. The rash typically took 2 to 4 weeks to resolve after discontinuing the antiseptics. Patch test performed in that series revealed negative reaction to chlorhexidine 0.5% aqueous (aq.), but an irritant reaction to cetrimide 0.5, 1 or 2% aq. and Savlon® (Johnson & Johnson Co., Taipei, Taiwan) at a dilution of 1:6 or 1:3. The results indicated irritant nature of the contact dermatitis. Histopathology of cetrimide-induced ICD is characterized by compact orthokeratosis and confluent parakeratosis without spongiosis. The ultrastructure was characterized by striking vesiculation and premature secretion of lamellar bodies, as well as abundant remnants of lamellar bodies and retention of corneodesmosomes in the horny layer. These findings suggest that abnormal keratinization may be attributable to dysfunction of lamellar bodies, which may be a direct effect of cetrimide on the lipids and enzymes of lamellar bodies.

After our first report, cetrimide has been replaced by triclosan in some but not all antiseptic products for personal hygiene or disinfection on the market. Despite these changes in antiseptic products, new patients with antiseptic-related ichthyosiform ICD continued to show up in our clinics. The purpose of this study was to analyze the clinical spectrum of a new series of ichthyosiform ICD caused by antiseptics used for personal hygiene. We hope that, through this report, the clinicians and general public can become more aware of the potential irritation effect of antiseptics.

PATIENTS AND METHODS

Cases with diagnoses of cetrimide dermatitis, Savlon dermatitis, and ichthyosiform ICD seen between October 1993 and August 2008 were retrieved from our department’s database via Crux system, an integrated database software developed in our department. The clinical pictures, medical records and histopathology were reviewed. Cases manifesting the characteristic inflamed or non-inflamed ichthyosiform skin lesions affecting the flexural, anogenital areas or other sites with relevant exposure histories were included for final analysis. The name of the antiseptic commercial products and exposure times were retrieved. The severity of skin lesions was graded as mild (ichthyosis-like scales or reticulate chapping with minimal or no erythema), moderate (erythematous lesions with scaly or glazed surface), or severe (scarlet to dusky red lesions with collodion membrane-like or chemical burn-like surface).

RESULTS

Totally, there were 35 patients (14 men and 21 women), with age ranging from 3 to 79 years (mean 45 years). The clinical features are summarized in Table 1. Clinically, the ichthyosiform rash affected flexural and/
or genital areas in 32 patients (91%). Twenty-eight patients (80%) had more than one anatomical region involved. The severity of skin lesions was mild in 7 patients (20%) (Fig. 1), moderate in 18 patients (51%) (Fig. 2), and severe in 10 patients (29%) (Fig. 3). The groins and axillae were the most commonly involved areas and showed a tendency to develop centrifugal erythematous rings (Fig. 4). Some patients displayed satellite lesions (Fig. 5). One patient presented with striking annular erythema around the pre-existing psoriatic lesions after self-application of Savlon® (Fig. 6). Skin biopsy was performed only in selected patients for differential diagnosis or to support the clinical diagnosis. A total of 6 skin biopsy specimens from 5 patients were examined. The pathology was characterized by compact orthokeratosis and focal or confluent parakeratosis in the epidermis without spongiosis (Fig. 7, 8). The horny layer was usually only slightly thickened but tended to be very compacted and stained brightly eosinophilic with a hyalinized appearance, corresponding to the glazed or collodion membrane-like surface of the lesions clinically. Focal retention of keratohyaline granules was noted in two cases. The dermis showed a relatively sparse superficial perivascular lymphocytic infiltrate in most cases. These findings were similar to those seen in our previous series of cetrimide-induced ichthyosiform ICD.6,7 According to medical records, 27 patients (77%) were seen during summer months and 22 had an underlying dermatosis

<table>
<thead>
<tr>
<th>Table. 1 Clinical Features of 35 Patients with Antiseptic-Related Ichthyosiform Irritant Contact Dermatitis</th>
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<tbody>
<tr>
<td>Male : Female</td>
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<tr>
<td>Age</td>
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<tr>
<td>Anatomical involvement</td>
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<td>Flexural area</td>
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<td>&gt;1 anatomical region</td>
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<td>Severity of skin lesions</td>
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<td>Mild</td>
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<td>Moderate</td>
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<td>Severe</td>
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<td>Occurred during summer months</td>
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<tr>
<td>Underlying or identifiable dermatoses</td>
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<tr>
<td>Antiseptics exposure with products specified</td>
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<tr>
<td>Savlon®</td>
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<tr>
<td>I.B.L.®</td>
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<tr>
<td>Li-De</td>
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<tr>
<td>Antiseptics exposure without products specified</td>
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<td>Duration of exposure</td>
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a: Mild: ichthyosis-like scales or reticulate chapping with little erythema; moderate: erythematous lesions with glazed surface; severe: fiery red to dusky red lesions with chemical burn-like surface.
b: Duration of exposure was recorded in 12 patients.
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(63%), including summer eczema, intertrigo, prurigo nodularis, urticaria, acneiform rash, folliculitis, chicken pox, herpes simplex, psoriasis vulgaris, and genital ulcer. Diagnoses before visiting our clinics included intertrigo, allergic contact dermatitis, ichthyosis, tinea cruris, or circinata. There was a father and son pair, who was referred to us for evaluation of ichthyosis vulgaris. The product names of antiseptics were recorded in 30 patients (86%), including Savlon® in 25 patients, I.B.L.® (I.B.L. Pharmaceutical Co., Chang-Hwa, Taiwan) in 4 patients, and “Li-De” (麗的) in 1 patient. “Li-De” was a product without a trademark or clear company information on the small white bottle but did show cetrimide as an ingredient. In the remaining cases, the name of the antiseptics was not specified in the medical records. The

Fig. 1
Mild ichthyosiform irritant contact dermatitis involving the posterior neck manifesting ichthyosis-like scaly patches with little or no erythema (Case 28).

Fig. 2
Moderately severe ichthyosiform irritant contact dermatitis involving the inner upper thighs manifesting erythematous patches with scaly, wrinkled or glazed surface (Case 27).

Fig. 3
Severe ichthyosiform irritant contact dermatitis involving the popliteal fossae manifesting dusky red to brown patches with chemical burn-like appearance (Case 21).

Fig. 4
Severe ichthyosiform irritant contact dermatitis involving the axillary areas manifesting scaly to crusted erythematous patches with centrifugal spread forming annular rings (Case 3).
Ichthyosiform Irritant Contact Dermatitis

Duration of exposure history was recorded in 12 patients, ranging from 4 days to 2 months, average 3.4 weeks. Most patients did not provide specific information of dilution or frequency of usage, but 3 patients applied undiluted solutions directly to skin and 1 patient reported washing twice to thrice daily.

Delayed diagnosis was very common prior to visiting our clinics. Patients seldom had any suspicion that the antiseptics might cause or aggravate rash until specifically asked about the history of using antiseptics. Most patients used the antiseptics either as

Fig. 5
Ichthyosiform irritant contact dermatitis involving the groin manifesting wrinkled or collodion-like scaly surface with satellite lesions (Case 34).

Fig. 6
Ichthyosiform irritant contact dermatitis around the pre-existing psoriasis vulgaris lesions manifesting striking scaly rings after topical application of undiluted antiseptics (Case 12).

Fig. 7
Biopsy of an ichthyosiform lesion (Case 29). The epidermis reveals compact orthokeratosis without spongiosis. (H&E, original magnification x100)

Fig. 8
Biopsy of an ichthyosiform lesion (Case 35). The epidermis reveals diffuse, compact parakeratosis with a hyalinized appearance. (H&E, original magnification x200)
liquid soap for bathing or as disinfectant, and often continued to use for the purpose of personal hygiene or self-treatment. In no cases was antiseptic-related dermatosis diagnosed prior to visiting our clinics. On the contrary, ichthyosiform ICD was either suspected or diagnosed in our clinics in all cases with the exception of one case in which deficiency disease was considered in addition to intertrigo or contact dermatitis.

**DISCUSSION**

A total of 35 new cases of antiseptic-induced ichthyosiform ICD were diagnosed in our department over the past 15 years. Most patients presented with moderate to severe skin lesions with flexural predilection. The groin and axillae were the most common flexures affected and there was a tendency for centrifugal spread in more severe cases even after discontinuation of antiseptics (Fig. 5). The preferential flexural involvement and the propensity for severe irritation can be explained by several local factors. The flexural skin is more susceptible to irritation because its horny layer is thin and easily disrupted by various physical insults, eczematous diseases or superficial infections such as intertrigo, atopic dermatitis, candidiasis and tinea cruris, particularly during summer months when there is increased local friction, heat and sweating. Eczematous process or superficial fungal infections can further compromise the skin barrier, and make the skin even more susceptible to the potential irritation effect of antiseptics.

In the present series, the clinical presentation was similar to that described in cetrimide-induced ichthyosiform ICD. This past experience had allowed us make correct diagnosis promptly in patients on their first visits, and skin biopsy was required less frequently in this series. The typical widespread or flexural involvement of ichthyosiform rash developed during summer months is highly suggestive of antiseptic-related ICD dermatitis. Moreover, the more severe or acute cases with diffuse or dusky red, chemical-burn like concentric annular rings were almost diagnostic of cetrimide-induced ICD, which could be confirmed easily by positive exposure history. Most patients had identifiable underlying pruritic dermatoses, and the antiseptics had been used for personal hygiene or self-treatment.

Antiseptic-induced ichthyosiform ICD needs to be differentiated from various other ichthyosiform or annular erythematous eruptions, including ichthyosis vulgaris, acquired ichthyosis, tinea circinata, psoriasis, erythema annulare centrifugum, and skin lesions of deficiency diseases such as zinc deficiency and necrolytic migratory erythema. Pertinent exposure history, in addition to medical history, physical examination and selected laboratory tests, including skin biopsy, are important for establishing diagnosis. Diffuse flexural contact dermatitis following antiseptic bath oil use has been reported recently. This dermatitis was shown to be a reaction to benzalkonium chloride, which is also a quaternary ammonium compound. These authors reported that inappropriate dilution of the antiseptic bath oil was common in their patients.

Once the diagnosis was made and the cause recognized, the patients were advised to discontinue antiseptics, and the skin lesions were treated with petrolatum-based ointments, most commonly hydrocortisone ointment 1% or urea cream 10%. Patients with severe or more acutely inflamed lesions were informed that the lesions might continue to progress and new lesions might appear for couple weeks even after discontinuation of antiseptics.

Since most of our patients applied antiseptics for personal hygiene or self-treatment of the underlying dermatoses, it is important to educate patients and the public that an-
tiseptics are not necessary for personal hygiene, and certainly is not a solution for treating non-infectious dermatoses or relief of itching. Moreover, people should follow the instruction for proper dilution if they choose to use antiseptics for personal hygiene.

We did a small survey of the contents of antiseptics on the market, and found that most antiseptic products in the store, particularly the liquid soaps, now listed triclosan and/or chlorhexidine as active ingredients, but cetrimide-containing antiseptics for consumers are still available. For example, we found two different kinds of Savlon® solution products on the market for personal hygiene and disinfection; one contains triclosan and chlorhexidine, while the other contains cetrimide and chlorhexidine. The two products look alike and could conceivably be mixed up readily. Moreover, the label on the product does not give sufficient warning of potential irritation to delicate skin areas and the skin with pre-existing cutaneous disorders.

Commercial products containing antibacterial agents have been widely advertised for personal hygiene in Taiwan. It has been our concern regarding the necessity and the potential side effects of using these products. There have been many other studies examining the benefits versus potential risks on these commercial products. Tan et al. reviewed studies (published between 1966 and 2001) on the effectiveness of antimicrobial ingredients in commercial products such as hand lotions and soaps, and found no data to support the efficacy or necessity of antimicrobial agents in such products. Moreover, some studies suggested increasing acquired bacterial resistance to them. Aiello et al. reviewed 27 studies (published between 1980 and 2006) focused on soaps containing triclosan in the range of 0.1-0.45% wt/vol, which were found to be no more effective than plain soap in preventing infectious illness symptoms and reducing bacterial levels on the hands. Several studies also demonstrated evidence of triclosan-adapted cross-resistance to antibiotics among different species of bacteria. Based on the available data and the risk of developing antibiotic-resistance, these authors suggest that further study on this issue and evaluation by governmental regulators regarding antibacterial product claims and advertising are warranted. They also felt that it is prudent to avoid the use of antimicrobial agents in consumer products, a view we concur fully not only for controlling antibiotic resistance but also for minimizing the risk of cutaneous side effects as observed in our patients.

CONCLUSION

Our study showed that commercially available antiseptics were important causes of ichthyosiform ICD in southern Taiwan. Misdiagnosis and delayed diagnosis were very common. This type of ICD should be differentiated from other dermatoses that may display ichthyosiform or annular skin lesions. Recognition of the abovementioned characteristic clinical features can prompt clinicians to the correct diagnosis and institution of appropriate treatment. We believe that this contact dermatitis deserves more attention from physicians and the public alike. We hope that the report of this study could lead to more public awareness of the potential irritation effects of antiseptics as well as the correct indication and appropriate way of their usage.

REFERENCES

抗菌潔身液導致的魚鱗癬樣刺激接觸性皮膚炎

李宜珮 李玉雲
國立成功大學醫學院及附設醫院皮膚部

背景：市售的抗菌劑（消毒藥水、潔身液）在台灣是很常見的個人衛生清潔用品。我們曾經報告過一系列的病例因使用抗菌劑所導致的魚鱗癬樣刺激性接觸性皮膚炎（ichthyosiform irritant contact dermatitis or cetrimide dermatitis）。

目的：收集並分析近年來抗菌潔身液導致皮膚炎的新病例，以正視此類抗菌劑之潛在皮膚刺激問題。

方法：從臨床病理回顧自1993年10月到2008年8月於成大醫院皮膚部診斷為cetrimide、沙威隆或魚鱗癬樣刺激性接觸性皮膚炎的病例中，篩選出具有典型病灶表現（魚鱗癬樣皮膚脫屑、炙紅或像化學藥劑灼傷般焦黑變化）及分布特徵（屈側及生殖肛門口周圍）並有明確接觸病史者，再加以分析討論。

結果：在我們的研究中，一共收集並分析了35個病例（14位男性及21位女性），年紀從3歲到79歲（平均45歲）。大部分的病例都發生在炎熱季節且許多病人已有如癢疹等潛在皮膚問題，並使用含有cetrimide的市售抗菌潔身液。接觸的時間為4天至2個月，平均為3.4個禮拜。絕大多數（80%）就診時已表現中重度的皮膚病灶（病灶呈脫屑、炙紅、焦黑或表面像上了一層釉一樣的變化，並以屈側及生殖肛門口周圍侵犯為主，尤其在鼠蹊及腋下可常見遠心性廣泛帶狀或網狀紅疹。沒有任何一個病人在初次就診時主動提出抗菌劑之接觸史，只有當臨床醫師懷疑而進一步詳問病史時才得知而做出正確診斷。其中有5位病人接受皮膚切片，其病理變化符合魚鱗癬樣刺激性接觸性皮膚炎。

結論：我們的研究發現自我使用含有cetrimide成份的抗菌潔身液在南台灣仍是導致魚鱗癬樣刺激性接觸性皮膚炎常見的原因。其中要鑑別診斷的包括魚鱗癬、圈癬、遠心性環狀紅斑、營養缺乏疾病。認識上述特徵有助於臨床醫師詢問相關接觸史並做出正確的診斷。（中華皮誌：27: 218-226, 2009）