

**ETIOLOGY, CLINICAL CHARACTERISTICS,  
AND RELATED FACTORS IN PATIENTS WITH FACIAL ALLERGIC  
CONTACT DERMATITIS UNDERGOING TREATMENT  
AT THE AESTHETIC DERMATOLOGY DEPARTMENT  
OF CAN THO DERMATO-VENEREOLOGY HOSPITAL IN 2024**

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**ABSTRACT**

**Background:** In recent years, facial allergic contact dermatitis, particularly those due to cosmetics, has become increasingly common. A study conducted in Denmark in 2021 revealed that 30.6% of cases of facial contact dermatitis were caused by cosmetics. Identifying the triggers, clinical features, and related factors of facial allergic contact dermatitis may help clinicians manage the condition more effectively. **Objectives:** 1) To determine the rate of triggers and clinical features among the patients; 2) To describe some related factors affecting patients with facial allergic contact dermatitis treated at the Aesthetic Dermatology Department of Can Tho Dermato- Venereology Hospital in 2024. **Materials and methods:** A cross-sectional study analyzed in 81 patients with facial contact dermatitis visited the Aesthetic Dermatology Department of Can Tho Dermato-Venereology Hospital in 2024. **Results:** 95.1% of patients had facial contact dermatitis caused by cosmetics. Itching was the reason for 98.8% of the hospital visits. Most clinical manifestations included erythema (92.6%) and dry skin/crusts (67.9%). Lesions on the cheeks were observed in 98.8% of cases, and 69.1% of patients had mild facial contact dermatitis. Higher rates of moderate to severe facial contact dermatitis were found in groups such as those aged 60 and older (100%), farmers (100%), homemakers (48.1%), chefs/bartenders (40%), and those with a past medical history of previous skin diseases (64.7%). **Conclusion:** Among 81 patients studied, 95.1% of them had facial contact dermatitis caused by cosmetics, and 98.8% came to the hospital because of itching. Related factors of the severity of the condition included age, occupation, and a past medical history of previous skin diseases.

**Keywords:** facial contact dermatitis; cosmetics; pruritus; allergic contact dermatitis.

**I. INTRODUCTION**

Allergic contact dermatitis (ACD) is a typical manifestation of a delayed hypersensitivity reaction mediated by T cells to exogenous agents [1]. Acute ACD manifestations include itchy patches, redness, vesicles/bullae, crusts. Chronic manifestations include dry skin, scaling, and lichenification. In recent years, facial allergic contact dermatitis, especially those caused by cosmetics, has become increasingly common. In a 2021 Danish study, when investigating contact dermatitis, the results showed that 26.2% of patients had facial contact dermatitis, of which 30.6% were caused by cosmetics [2]. Identifying the causative agents of facial allergic contact dermatitis and understanding the characteristics and related factors of the disease help clinicians better manage facial allergic contact dermatitis. Therefore, we conducted a study on “Etiology, clinical characteristics, and related factors in patients with facial allergic contact dermatitis undergoing treatment at the aesthetic dermatology department

of Can Tho hospital of Dermato-Venereology in 2024” with two objectives: To determine the rate of triggers and clinical features among patients and to describe some related factors affecting patients with facial allergic contact dermatitis treated at the Aesthetic Dermatology Department of Can Tho Hospital of Dermato-Venereology in 2024.

## II. MATERIALS AND METHODS

### 2.1. Materials

The participants included patients diagnosed with facial allergic contact dermatitis at Can Tho Hospital of Dermato-Venereology in 2024.

Standards for selection were based on clinical features: a past medical history of exposure to allergens, acute symptoms including red patches with regular borders, superficial vesicles/bullae, papules, excoriations, crusts, and itching, subacute symptoms involving small, slightly red patches with dry scales, sometimes accompanied by small red spots or firm and round papules, chronic symptoms including lichenification, scaling with small, firm, round, flat satellite papules, excoriations, and hyperpigmentation [3].

Standards for elimination included patients with any concurrent skin condition (acne vulgaris, atopic dermatitis, psoriasis, fungal infection, etc.), patients who did not agree to participate in the study, and patients with psychiatric disorders.

The study was conducted from June 2024 to October 2024 at Can Tho Hospital of Dermato-Venereology.

### 2.2. Methods

Our research design was a cross-sectional study with 81 participants. The formula to calculate the minimum sample size was used is

$$n = Z_{(1-\alpha/2)}^2 \frac{p(1-p)}{d^2}$$

with  $d = 0.1$  and  $p = 0.274$  [4]

**Sampling method:** Convenience sampling was employed, including patients who met the inclusion criteria and were not excluded at Can Tho Hospital of Dermato-Venereology from June to October of 2024.

#### **Research contents:**

General characteristics of the study population: gender, age group, occupation.

Clinical characteristics and factors related to facial contact dermatitis: reason for hospitalization, causative agents, dermatological history, clinical symptoms, lesion location on the face, and severity according to CSS.

**Data collection and analysis methods:** Data were collected through a structured questionnaire and clinical examination, and analyzed using SPSS 20.0 software).

**Ethical Considerations:** Study participants were selected based on predetermined standards for selection and elimination, and were provided with detailed information about the research. They were given the right to withdraw from the study at any point. All participant data was handled with strict confidentiality. Data collection and analysis were conducted with meticulous objectivity and transparency.

### III. RESULTS

Our study on 81 patients with facial allergic contact dermatitis revealed the following findings:

#### 3.1. General characteristics of patients with facial allergic contact dermatitis

Table 1. Distribution of patients by gender

General characteristics		Frequency (n)	Percentage (%)
Gender	Female	81	100
	Male	0	0
Age group	<18 years	6	7.4
	18-59 years	73	90.1
	≥60 years	2	2.5
	Age range	13-62	
	Mean age	35.63±11.39	
Occupation	Spa and beauty industry	4	4.9
	Chefs/Bartenders	5	6.2
	Students	11	13.6
	Office workers	26	32.1
	Teachers	5	6.2
	Farmers	3	3.7
	Homemakers	27	33.3

Patients diagnosed with facial allergic contact dermatitis were all female. The mean age of the study subjects was  $35.63 \pm 11.39$  years (ranging from 13 to 62 years). The age group of 18-59 years dominated, accounting for 90.1%. It was noted that 33.3% of patients were homemakers, followed by office workers at 32.1% and students at 13.6%.

#### 3.2. Clinical characteristics of facial allergic contact dermatitis

Table 2. Triggers of facial allergic contact dermatitis

Trigger	Number of patients (n)	Percentage (%)
Cosmetics	77	95.1
Topical medications	2	2.5
Plants/Insects	1	1.2
Fabrics (gloves, clothing, masks, etc.)	1	1.2
Total	81	100

The predominant cause was cosmetics, accounting for 95.1%.

Table 3. Distribution of patients by past medical history

Past medical history	Number of patients (n)	Percentage (%)
Atopic dermatitis	7	8.6
Sensitive skin	9	11.1
None	65	80.2
Total	81	100

11.1% of patients had a history of sensitive skin, while 8.6% reported a history of atopic dermatitis.

Table 4. Distribution of patients by chief complaint

Chief complaint	Number of patients (n)	Percentage (%)
Pruritus	80	98.8
Burning sensation	18	22.2
Erythema	72	88.9
Vesicles	11	13.6

Pruritus and erythema were the most prevalent symptoms, with rates of 98.8% and 88.9% respectively.

Table 5. Distribution of patients by clinical symptoms

Clinical symptom	Number of patients (n)	Percentage (%)
Erythema	75	92.6
Papule	15	18.5
Vesicle	12	14.8
Pustule	7	8.6
Edema	27	33.3
Excoriations/ulcers	2	2.5
Xerosis/scaling	55	67.9
Hyperpigmentation	5	6.2

Prominent symptoms were erythema (92.6%), xerosis/scaling (67.9%).

Table 6. Distribution of patients by facial lesions

Facial region	Number of patients (n)	Percentage (%)
Forehead	72	88.9
Around the mouth/lips	34	42
Chin	58	71.6
Cheek	80	98.8
Neck	7	8.6
Around the eyes	22	27.2

Cheek and forehead are the two regions with the highest rates with 98.8% and 88.9%, respectively.

Table 7. Distribution of patients by severity

CCS severity score	Number of patients (n)	Percentage (%)
Mild	56	69.1
Moderate	22	27.2
Severe	3	3.7
Total	81	100

Patients with mild disease predominate with 69.1%.

### 3.3. Related factors of facial allergic contact dermatitis

Table 8. The relationship between disease severity and age groups

Age group	Disease severity		Total	P
	Mild	Moderate-Severe		
<18	6 (100%)	0	6 (100%)	0.027
18-59	50 (68.5%)	23 (31.5%)	73 (100%)	
≥60	0	2 (100%)	2 (100%)	
Total	56 (69.1%)	25 (30.9%)	81 (100%)	

The lowest classification of moderate-severe disease was in the group <18 years old (0%), the highest was in the group  $\geq 60$  years old (100%). The difference was statistically significant with  $P=0.027$

Table 9. The correlation between disease severity and occupation

Occupation	Disease severity		Total	P-value
	Mild	Moderate-Severe		
Beauty industry	4 (100%)	0	4 (100%)	0.003
Chef/bartender/barista	3 (60%)	2 (40%)	5 (100%)	
Student	11 (100%)	0	11 (100%)	
Office worker	20 (76.9%)	6 (23.1%)	26 (100%)	
Teacher	4 (80%)	1 (20%)	5 (100%)	
Farmer	0	3 (100%)	3 (100%)	
Homemaker	14 (51.9%)	13 (48.1%)	27 (100%)	
Total	56 (69.1%)	25 (30.9%)	81 (100%)	

The occupational groups with a high proportion of moderate-to-severe illness were farmers (100%), homemakers (48.1%), and chefs/bartenders (40%). The difference was statistically significant, with a p-value of 0.003.

Table 10. The correlation between the severity of the disease and the history of skin diseases.

The history of skin diseases	Disease severity		Total	P-value
	Mild	Moderate-Severe		
With a history of previous skin disease	6 (35.3%)	11 (64.7%)	17 (100%)	0.001
Without a history of previous skin diseases	50 (78.1%)	14 (21.9%)	64 (100%)	
Total	56 (69.1%)	25 (30.9%)	81 (100%)	

The group with a history of previous skin diseases had a higher proportion of moderate to severe classification compared to the group without previous skin diseases (64.7% > 21.9%). The difference was statistically significant, with a p-value of 0.001.

## IV. DISCUSSION

### 4.1. General characteristics of the study subjects

Our study recorded that all patients with facial allergic contact dermatitis were female. This reflects the fact that women frequently use cosmetics and skincare products, leading to a higher risk of contact dermatitis. The average age of the patients was  $35.63 \pm 11.39$  years, with the highest proportion falling within the 18-59 age group, accounting for 88.9% of the sample.

Compared to other studies, Omar B Alluhayyan's research also reported that the majority of patients were female (66.7%) [5]. Meanwhile, Pranee Kasemsarn's study recorded an average patient age of  $37.3 \pm 14.8$  years, slightly higher than our study [4]. This difference may be influenced by demographic characteristics and exposure risk factors to irritants in daily living and work environments.

The study by Waritta Dararattanaroj indicated that the three occupational groups with the highest prevalence of the disease were office workers (38.3%), students (16.5%), and homemakers (7.8%) [6]. However, our study showed a different distribution in occupations, with homemakers (33.3%), office workers (32.1%), and students (13.6%) being the primary occupational groups. This discrepancy may be due to differences in living

and working environments in Vietnam compared to other countries, as well as social factors and skincare habits of the population.

#### **4.2. Clinical characteristics of the study subjects**

##### **Triggers of the disease**

Our study found that 95.1% of patients with facial allergic contact dermatitis were caused by cosmetics, while 2.5% were due to topical medications, and 1.2% were caused by insect/plant secretions and fabrics (gloves, clothing, masks). These findings highlight the significant role of cosmetics as the primary trigger, aligning with the global increase in cosmetic use, particularly among women.

According to Joseph Fowler, allergen exposure can be identified by analyzing patients' daily activities, such as using topical products, cosmetics, personal hygiene items, hair dyes, perfumes, gloves, and clothing [7]. Environmental factors like insect secretions, chemical dust, and pollen are also high-risk sources. This supports our findings that while cosmetics are the primary cause, other factors also contribute to allergic contact dermatitis. Cosmetic products contain potential allergens, including preservatives (parabens, formaldehyde), synthetic fragrances, colorants, and chemical derivatives. These compounds can cause irritation or delayed allergic reactions upon prolonged exposure. The lack of stringent ingredient regulations in certain cosmetic products may further increase the risk of allergic contact dermatitis.

##### **Past medical history of dermatological conditions**

In our study, 11.1% of patients reported a history of sensitive skin and 8.6% had a history of atopic dermatitis.

According to Czarnobilska, patients with allergic contact dermatitis (ACD) often had a prior history of skin disorders or atopic diathesis (e.g., infantile atopic eczema, asthma, or conjunctivitis) [8]. Furthermore, in a study by Jonathan I Silverberg and colleagues, over 50% of patients who tested positive on Patch tests had a previous medical record of skin disease [9].

##### **Chief complaint**

In our study, the primary reason for patients seeking medical attention was pruritus, occurring in 98.8% of cases. Erythema and burning sensation followed, with respective rates of 88.9% and 22.2%.

According to Bourke, acute symptoms included pruritus, burning, erythema, edema, vesicles, pustules, papules, etc. [10]. This suggested that allergic contact dermatitis, upon onset, caused significant discomfort to patients, leading to the pursuit of medical intervention.

##### **Clinical symptoms**

The most common clinical manifestations in our study were erythema (92.6%) and xerosis/scaling (67.9%). Less frequent symptoms included edema (33.3%), papules (18.5%), vesicles (14.8%), pustules (8.6%), hyperpigmentation (6.2%), and excoriations/ulcers (2.5%).

Compared to Seok Young Kang's study, our research reported a significantly higher prevalence of erythema (92.6% vs. 70.37%), whereas the prevalence of papules (18.5% vs. 22.22%) and vesicles (14.8% vs. 7.4%) showed notable differences [11]. These variations may be attributed to differences in causative agents, levels of allergen exposure, and individual immune responses among patients. Additionally, environmental conditions, skincare routines, and cosmetic usage habits may contribute to the discrepancies observed between studies.

Overall, our study indicates that facial allergic contact dermatitis presents a diverse range of clinical manifestations, with erythema and xerosis/scaling being the predominant

symptoms. The differences from previous studies highlight the role of environmental factors, exposure sources, and skin physiology variations across different populations.

#### **Facial lesions distribution**

Our study reported that the cheeks and forehead regions were the primary sites of facial involvement, with prevalence rates of 98.8% and 88.9%, respectively.

These findings were consistent with the study by Seok Young Kang, which reported cheeks (48.14%) and forehead (29.62%) as the most affected facial regions [11].

#### **Severity**

Based on the CSS severity score, our study showed that mild cases predominated (69.1%), while severe cases were less common (3.7%). This result aligns with Verma's study, which also used the CSS score, reporting a high proportion of mild cases (52.4%) and a lower proportion of severe cases (14.3%) [12].

The variation in severe case rates between the two studies may be influenced by demographic characteristics, environmental factors, and levels of allergen exposure. Additionally, patients in our study may have had better skincare awareness or accessed treatment earlier, allowing for better disease control. This underscores the importance of early detection and timely treatment in preventing progression to more severe forms of contact dermatitis.

### **4.3. Related factors of facial allergic contact dermatitis**

#### **Relationship between disease severity and age groups**

No severe cases were observed in patients under the age of 18, whereas those aged 18 to 59 displayed a prevalence of 31.5% and the remaining group demonstrated the highest incidence, reaching 100%. The difference was statistically significant with  $p=0.027$ . According to Sharma, children were less affected due to less exposure to potential allergens and an immature immune system [13]. Prakash suggested that repeated exposure to sensitizing agents may be the cause of higher incidence and severity of ACD in the elderly. Additionally, comorbidities, including stasis dermatitis and venous ulcers, contributed to an exacerbated allergic contact dermatitis in the elderly [14].

#### **Relationship between disease severity and occupation**

In our study, the groups with a higher proportion of moderate-to-severe disease severity in descending order were: farmers (100%), homemakers (48.1%), chefs/bartenders, etc. (40%), office workers (23.1%), teachers (20%), spa/beauty industry (0%), students (0%). The difference was statistically significant with  $p=0.003$ .

The results can be explained by the fact that farmers and homemakers had less time to take care of their skin and their work often involved exposure to dirt, sun, etc., which contributed to worsening the condition. Therefore, the rate of severe disease in these groups was the highest.

#### **Relationship between disease severity and history of skin diseases**

In our study, the group with a past medical history of skin diseases had a higher proportion of moderate-to-severe classification than the group without a previous history of skin diseases (64.7% versus 21.9%).

According to Czarnobilska, patients with ACD often had a previous history of skin diseases or hypersensitivity [8]. Bangash suggested that the stratum corneum formed a protective barrier for the skin, preventing the penetration of allergens [15]. Patients with a previous history of skin diseases had an impaired skin barrier, so the disease was more likely to progress more severely than patients without a previous history of skin diseases.

## V. CONCLUSION

In 81 patients with facial allergic contact dermatitis, 95.1% had facial contact dermatitis due to cosmetics, 98.8% of patients came for a visit due to itching, and the factors related to disease severity included age, farmers, homemakers, chefs/bartenders, etc., and a previous history of skin diseases.

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