

# Significant Responses of Skin Conditions or Other Disorder after COVID-19 Vaccine

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## Abstract

This paper reviews the literature focusing on changes in skin conditions after vaccination following the pandemic of COVID-19. This review paper is a critical literature review, and a narrative review approach has been used for this study. A total of 588 references were selected using representative journal search websites such as PubMed, Google Scholar, Scopus, ResearchGate, which a total of 44 papers were selected in the final stage based on 2021 to 2022. There are many side effects after vaccination, some recover over time and some do not. It was briefly reviewed in Johnson syndrome, Acquired hemophilia A, and Vasculitis flare. The idea is that the COVID-19 pandemic is putting people at risk, and the vaccine to prevent it may not be safe. This article provides a positive view on the development of new vaccine-enhancing technologies. The eradication of Covid-19 will require active efforts not only by medical staff and medical policies but also by patients themselves.

**Keywords:** Vaccine, COVID-19, Johnson syndrome, Acquired hemophilia A, Vasculitis flare

## Introduction

On December 31, 2019, a novel disease caused by severe acute respiratory syndrome type 2 coronavirus (SARS-CoV-2) was first reported in China (Shereen *et al.*, 2020). On January 30, 2020, the World Health Organization (WHO) announced that the novel coronavirus pneumonia epidemic had been designated as an international public health emergency. On February 11, WHO officially named the disease 2019 Coronavirus disease (WHO, 2020a; Ahn, 2021). COVID-19 has had a devastating effect on almost every country in the world (Lee *et al.*, 2021). It is a hyperinflammatory and multisystemic viral infection primarily characterized by immune system dysregulation, complement activation, and induction of the coagulation cascade (Bostan *et al.*, 2022). Since the novel coronavirus is highly contagious and

spreads rapidly, mild or asymptomatic infections can also be found (Han *et al.*, 2021). To prevent virus transmission, DNA-based or RNA-based vaccines, non-replicating viral vector vaccines, protein subunit recombinant vaccines, and inactivated vaccines are being developed (Desai *et al.*, 2021). More than 200 COVID-19 vaccines are listed by the WHO as being developed. Expectations for an effective prophylactic COVID-19 vaccine are very high (WHO, 2020b). A vaccine that has been shown to be effective and safe in clinical trials could hit the market (Li *et al.*, 2005). Several vaccines have been approved for the market, such as Pfizer-BioNtech's BNT162b2 and Moderna's mRNA-1273 (Doherty *et al.*, 2021). However, with increasing usage, multiple skin side effects of the COVID-19 vaccine are being reported. Expression of heterogeneous skin lesions such as Stevens-Johnson syndrome (SJS), Acquired hemophilia A (AHA) and

"vasculitis" was secondary after SARS-CoV-2 vaccination.

Public concern about vaccine side effects has long been a problem facing health care providers since the outbreak of the smallpox vaccine in 1798. With the rapid process for vaccine approval, the potential harm of vaccines is one of the most commonly reported concerns (Chevallier *et al.*, 2021). Growing people's distrust of the COVID-19 vaccine will be a major predicament for countries trying to implement compulsory vaccination. In recent years, many countries have expressed interest in requiring their citizens to be vaccinated to ensure a safe and healthy environment (Vergara *et al.*, 2021). In addition, airlines are starting to consider the compulsory use of health passports or vaccine passports for overseas travelers as proof of vaccination (Memish *et al.*, 2021).

However, governments and businesses may have to prioritize building public confidence even before implementing compulsory immunizations. WHO has identified six determinants of trust in the capacity, objectivity, fairness, consistency, integrity and trust that should be transformed into public education (WHO IRIS, 2017). According to Blanchard *et al.* (2020) prior education of vaccines is appropriate, effective, more localized and relevant. He said that through a specific public education, people can get vaccinated and build confidence in the government.

Despite a generally positive course following large-scale vaccination campaigns involving the SARS-CoV-2 vaccine, vaccine-related adverse events are increasingly being reported. The significance of these reactions has not yet been elucidated (Temiz *et al.*, 2021). There are numerous skin reaction patterns that can occur following a COVID-19 vaccination, and as such, most of the skin findings are immunological/autoimmune in nature. We wanted to objectively identify trends in internet search queries to address public concerns about the side effects of COVID-19 vaccination.

**1. Systematic review of literature**

This review paper is a critical literature review, and a narrative review approach has been used for this study. PubMed, Google Scholar, ResearchGate, and Web of Science databases using the keywords "SARS-CoV-2", "Vaccine", "COVID-19", "Johnson syndrome", "Acquired hemophilia A", "Vasculitis flare" and Manual searching of reference lists of included articles augmented the research. References were selected using representative journals based on the recent of these years (2021-2022). We used the PRISMA flowchart to record the inclusion

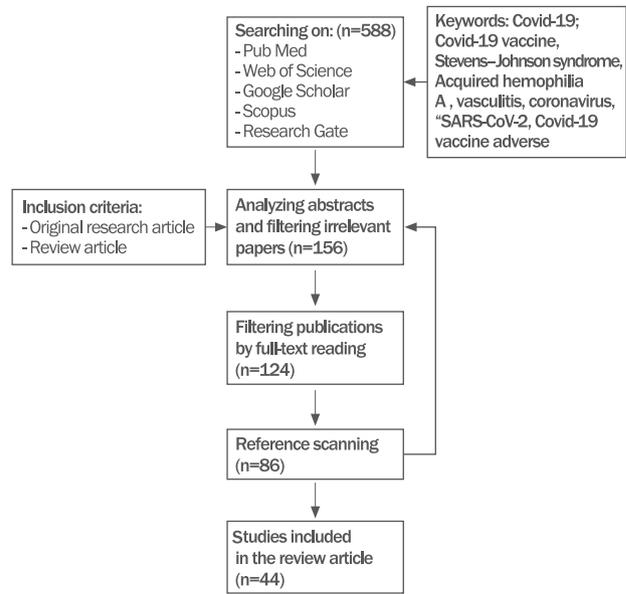


Figure 1. The PRISMA flow diagram flowchart of search process.

and exclusion of studies in the review (Figure 1).

**2. Inclusion criteria**

Inclusion criteria comprised all original studies presenting cases who manifested skin reactions after getting COVID-19 vaccines. We only included original human studies that were written in the English language. The exclusion criteria were non-English studies, review articles, and articles that did not present a case of post-COVID-19 vaccine skin reaction.

**Findings**

14 cases Stevens-Johnson syndrome (SJS) 5 cases, Acquired hemophilia A (AHA) 4 cases, Leukocytoclastic vasculitis flare 5 cases were included. Seven female (50%) and 7 male (50%) patients were identified. With respect to vaccines such as Pfizer (4 cases), Moderna (5 cases), AstraZeneca (1 case), Sinopharm (2 cases), and COVAXIN (2 cases), two-thirds (9 cases) of patients reported symptoms within 7 days. There were no deaths reported in the analysis. The characteristics of the study are presented in Tables (Table 1, 2, 3).

**1. Stevens-Johnson syndrome (SJS)**

The diagnosis of SJS is based on clinical suspicion and

histological findings. Suspicion of SJS in this case is based on erythema on the skin, sudden appearance of reticular patches, mucosal ulceration, and systemic symptoms (Dash *et al.*, 2021b). Diagnosed with the presence of epidermal keratinocyte necrosis. A similar diagnostic approach, including clinical findings, confirmatory history, and histopathological findings, was adopted for SJS as Chahal *et al.*, 2018).

Two typical examples are as follows (Atak *et al.*, 2022; Mansouri *et al.*, 2021).

A 37-year-old male patient visited our hospital complaining of eczematous lesions without itching on the arms and legs. He had his first dose of BNT162B2 vaccine 18 days ago. According to the patient, he reported a painless, slowly progressive lower extremity rash that lasted for 4 days. He reported persistence of local pain and erythema for 1–2 hours after vaccination.

He did not require treatment, including non-steroidal anti-inflammatory drugs. He has had a history of systemic/dermatological diseases and drug use in the past 8 weeks and has never been diagnosed with COVID-19. He was given topical mometasone furoate, vitamin C 1g/day and pentoxifylline 400 mg twice daily, and the lesions regressed within 3 weeks (Atak *et al.*, 2022).

A 49-year-old woman with a history of successfully treated breast cancer has been hospitalized in response to a second dose of COVID-19 vaccine (0.05 mL IM, COVID-19 vaccine (Sinopharm). On the day of vaccination, she experienced headache, nausea, and She said she experienced muscle aches and burning of the mouth and genitals. For the next 3 days she observed ulcers on the lips, mouth and vagina. A single rash was also observed on her left palm. The patient had fever, vomiting,

**Table 1. Report of Stevens–Johnson Syndrome (SJS) symptoms and extracutaneous disorders after vaccination**

	Age (years)	Epidemiology/Symptom	Type of vaccine	Time of clinical onset (days)	References
Stevens–Johnson syndrome (SJS)	37/M	Eczematous lesions and lower extremity rashes	Pfizer-BioNTech	18	Atak <i>et al.</i> , 2022
	49/F	Headache, nausea, muscle aches, and burning of the mouth and genitals	Sinopharm	1	Mansouri <i>et al.</i> , 2021
	60/M	Fever, mouth ulcers, and skin rashes	ChAdOx1 nCoV-19	3	Dash <i>et al.</i> , 2021b
	63/F	oral and upper lip ulcers, itchy erythema and bullous rash, especially on the body, arms and legs, and generalized	Sinopharm	1	Mansouri <i>et al.</i> , 2022
	78/F	Multiple targeted erythema with severe itching all over the body	Pfizer-BioNTech	12	Kim <i>et al.</i> , 2022

**Table 2. Reporting of Acquires Hemophilia A (AHA) symptoms and extracutaneous disorders after vaccination**

	Age (years)	Epidemiology/Symptom	Type of vaccine	Time of clinical onset (days)	References
Acquires hemophilia A (AHA)	69/M	Bruising and contusion	Pfizer-BioNTech	9	Radwi & Farsi, 2021
	70/M	Ecchymosis on shoulder and arm	mRNA-1273	8	Lemoine <i>et al.</i> , 2022
	72/F	Extensive skin bruises	mRNA-1273	14	Cittone <i>et al.</i> , 2021
	86/M	Spontaneous disseminated hematoma with severe anemia	BNT162b2	14	Leone <i>et al.</i> , 2022

**Table 3. Leukocytoclastic vasculitis flare symptoms and extracutaneous disorders after vaccination**

	Age (years)	Epidemiology/Symptom	Type of vaccine	Time of clinical onset (days)	References
Stevens–Johnson syndrome (SJS)	27/M	Multiple itching, urticaria erythematousus	Moderna, Pfizer	1	Dash <i>et al.</i> , 2021a
	31/F	Leukocytoclastic vasculitis flare with a markedly asymmetric distribution	COVAXIN®	4	Kharkar <i>et al.</i> , 2021
	33/M	Symptoms of a widespread, violent rash	mRNA	3	Bostan <i>et al.</i> , 2021
	46/F	Leukoblastic vasculitis. Purpura papules distributed on both lower extremities	BNT162b2 mRNA	2	Cohen <i>et al.</i> , 2021
	46/F	Intolerance to purpura on the leg, joint pain, swelling of the ankle joint	COVAXIN®	5	Kar <i>et al.</i> , 2021

arthralgia, dyspnea and wheezing were not reported. The lesions were completely resolved within a week (Mansouri *et al.*, 2021).

The period from inoculation to symptom onset varied from 1 to 18 days. Two patients took 1 day, one patient took 3 days, and the rest took 12 and 18 days, respectively.

### 2. Acquired hemophilia A (AHA)

Acquired Hemophilia A (AHA) is a rare bleeding disorder caused by a functional deficiency of coagulation factor VIII (FVIII). Targeting FVIII can neutralize the procoagulant effect of autoantibodies and cause severe bleeding. Such inhibitory autoantibodies have been detected in autoimmune diseases, pregnancy, infections, and malignant diseases. Old age and certain medications are known co-risk factors (Tiede *et al.*, 2021).

AHA patients are young, often elderly, with the exception of female patients who are pregnant or postpartum (Hirsiger *et al.*, 2022). In most cases, the onset occurred within 2 weeks in the elderly. Autoimmune diseases and comorbidities such as cancer are commonly associated with AHAs (Green *et al.*, 1981). Bleeding from AHAs is most commonly skin related. Deep tissue bleeding (eg, joints) is less common than in congenital hemophilia A. There are few reported cases of infection or vaccination as possible triggers for AHA. This is not the first case of AHA infection triggered by a COVID-19 vaccination. A literature search revealed four AHA cases (Table 2) associated with COVID-19 infection.

As a representative case, a 69-year-old man suffered a slight bruise on his left wrist 9 days after the first dose of the COVID-19 vaccine. He did not provide a personal or family history of bleeding disorders. After his second dose of COVID-19, he noticed several new bruises on his arms and legs (Radwi & Farsi, 2021).

According to Cittone (2021)'s study, it is currently unknown whether a COVID-19 vaccine can trigger the development of AHA, or whether the association should be considered a coincidence.

### 3. Leukocytoclastic vasculitis flare

Leukocytoclastic vasculitis flares are known to be caused by infection, medications, and vaccination. It is a rare condition secondary to idiopathic, underlying infections, connective tissue disorders, malignancies, and drugs. The cause of the disease is related to the deposition of immune complexes in small blood

vessels, which activate the complement system and recruit white blood cells (Fiorillo *et al.*, 2021). Several vaccines are reported to be associated with small vessel cutaneous vasculitis, such as influenza vaccine, meningococcal B, hepatitis A vaccine, hepatitis B, BCG and HPV (Bonetto *et al.*, 2016). All patients here were in their 20s and 40s. Except for the recent vaccination, no other factors were identified as triggers, and all symptoms occurred within 1 week after vaccination.

As a representative example, a healthy 33-year-old man came to the clinic with a widespread, violent rash three days after his first dose of inactivated COVID-19 vaccine. He has recently reported no history of infection, fever, cough, arthralgia, or difficulty breathing. On his dermatological examination, he showed erythematous spots and palpable papules on his leg, forearm and right abdomen. Five days later, his skin lesions turned into vivid purple palpable papules. He had no known rheumatic or skin conditions. Complete blood count, liver/kidney function test, urinalysis, chest X-ray, and fecal oral fluid test were all within the normal range. The rheumatoid marker was negative. Diagnosed as IgA vasculitis without systemic involvement by its clinicopathological correlation. Topical mometasone furoate was prescribed twice daily with partial resolution (Bostan *et al.*, 2021). Bostan *et al.* (2021) pointed out a relationship between the onset of IgA vasculitis and COVID-19 vaccination to raise awareness of the cutaneous adverse effects of an inactivated COVID-19 vaccine.

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## Conclusion

As the pandemic continues, several COVID-19 vaccine formulations have been approved for emergency use. Because this far outweighs the risks of the current pandemic vaccine, such rare reactions should not prevent people from getting vaccinated. Vaccination could be the only effective and economical way to control this pandemic (Begum *et al.*, 2021). Starting with the COVID-19 vaccination, the world's population has been given relief (Mathieu *et al.*, 2020). The epidemic has stress modern humans externally or internally (Lim & Kown, 2020) and shut down the city. However, the vaccine has given hope to bring the city back (Doherty *et al.*, 2021). More than 10.7 billion COVID-19 vaccines have been administered worldwide, and 62.7% of the world's population is considered vaccinated (Mathieu *et al.*, 2020). The most common side effects

reported with the COVID-19 vaccine are injection side pain, fever, chills, arthralgia, myalgia, and headache (Lemoine *et al.*, 2022). Treatment of skin conditions should include shared decision-making between patients and providers, taking into account each patient's severity or overall health. Specifically, risk factors for COVID-19 should be considered based on diseases such as gender or age, autoimmune disease, hypertension, cardiovascular disease, diabetes, and cancer (Wu *et al.*, 2020). All patients should not overlook the importance of following current public health recommendations, including wearing a mask, getting vaccinated, and practicing social distancing. These recommendations are based on currently available data. However, the COVID-19 pandemic continues to change rapidly and these recommendations may change as more data becomes available (Arora *et al.*, 2021). In addition, safety monitoring is the core of vaccine performance monitoring. Routine pharmacovigilance activities are currently potentially serious after influenza vaccination. However, it is a major source of identifying rare adverse events and relies heavily on passive reporting. There is a limit in that it is not possible to estimate the incidence rate of specific side effects or the relationship with vaccination (Wijnans *et al.*, 2016). Data on COVID-19 vaccines are currently lacking, but despite this limited knowledge, COVID-19 vaccines are safe and effective. In some cases, it is suggested to check for antibodies after vaccination and, if necessary, boost the level of protective antibodies by immunization (Ayatollahi *et al.*, 2021). The successful development of a COVID-19 vaccine is relevant for almost every country and people around the world. Efficacy studies of COVID-19 vaccines are progressing rapidly, but questions about the speed of development and long-term efficacy remain. Seasonal boosters may also be needed as new variants appear (Pereira *et al.*, 2022). However, everyone follows quarantine guidelines, and the most important prevention strategy is the implementation of PCR tests to identify those in need of treatment. There is a global trend towards releasing COVID-19 related restrictions, at least in the open places. Still further policies are awaiting to control the condition. In addition to vaccines, solutions for preventive treatment should be more formalized. The eradication of COVID-19 requires active efforts by the medical staff and medical policy as well as the patients themselves. To a greater extent, the data presented here and our epidemiologic analysis suggest that vaccination-related immunological phenotypes may occur independent of vaccine-antigen. In conclusion, more detailed epidemiologic

and immunological studies on single clinical case reporting are needed to better understand post-vaccination side effects. Current data may be helpful in considering the risk of post-vaccination adverse events (AEFIs) that are very rare but have not yet been substantiated.

### Author's contribution

SL designed, conceptualized and supervised the review and collected literatures. SL wrote the overall papers. KHK did advisory. All authors read and approved the final manuscript.

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## References

- Ahn MJ. Knowledge, attitude, and prevention practice of cosmetology students toward Covid-19 infectious disease. *Asian Journal of Beauty and Cosmetology*, 19: 459-466, 2021.
- Arora H, Boothby-Shoemaker W, Braunberger T, Lim HW, Veenstra J. Safety of conventional immunosuppressive therapies for patients with dermatological conditions and coronavirus disease 2019: a review of current evidence. *The Journal of Dermatology*, 49: 317-329, 2021.
- Atak MF, Farabi B, Kalelioglu MB, Rao BK. Pigmented purpuric dermatosis after BNT162B2 mRNA COVID-19 vaccine administration. *Journal of Cosmetic Dermatology*, 21: 435-437, 2022.
- Ayatollahi A, Hosseini H, Firooz R, Firooz A. COVID-19 vaccines: What dermatologists should know? *Dermatologic Therapy*, 34: e15056, 2021.
- Begum J, Mir NA, Dev K, Buyamayum B, Wani MY, Raza M. Challenges and prospects of COVID-19 vaccine development based on the progress made in SARS and MERS vaccine development. *Transboundary and Emerging Disease*, 68: 1111-1124, 2021.

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- Blanchard JL, Johnson C, McIntyre M, Crowcroft NS, McLellan A. A pre and post intervention study measuring the effect of interactive education on adolescent perceptions of vaccines, vaccine safety and disease risk. *Journal of Public Health (Oxf)*, 42: e272-e277, 2020.
- Bonetto C, Trotta F, Felicetti P, Alarcón GS, Santuccio C, Bachtar NS, Pernus YB, Chandler R, Girolomoni G, Hadden RDM, *et al.* Vasculitis as an adverse event following immunization: systematic literature review. *Vaccine*, 34: 6641-6651, 2016.
- Bostan E, Gulseren D, Gokoz O. New-onset leukocytoclastic vasculitis after COVID-19 vaccine. *International Journal of Dermatology*, 60: 1305-1306, 2021.
- Bostan E, Zaid F, Akdogan N, Gokoz O. Possible case of mRNA COVID-19 vaccine-induced small-vessel vasculitis. *Journal of Cosmetic Dermatology*, 21: 51-53, 2022.
- Chahal D, Aleshin M, Turegano M, Chiu M, Worswick S. Vaccine-induced toxic epidermal necrolysis: a case and systematic review. *Dermatology Online Journal*, 24: 13030, 2018.
- Chevallier C, Hacquin AS, Mercier H. COVID-19 vaccine hesitancy: Shortening the last mile. *Trends in Cognitive Sciences*, 25: 331-333, 2021.
- Cittone MG, Battegay R., Condoluci A, Terzi di Bergamo L, Fernandes E, Galfetti E, Nosedà R, Leuppi-Taegtmeyer A, Drexler B, Ceschi A, *et al.* The statistical risk of diagnosing coincidental acquired hemophilia A following anti-SARS-CoV-2 vaccination. *Journal of Thrombosis and Haemostasis*, 19: 2360-2362, 2021.
- Cohen SR, Prussick L, Kahn JS, Gao DX, Radfar A, Rosmarin D. Leukocytoclastic vasculitis flare following the COVID-19 vaccine. *International Journal of Dermatology*, 60: 1032-1033, 2021.
- Dash S, Behera B, Sethy M, Mishra J, Garg S. COVID-19 vaccine-induced urticarial vasculitis. *Dermatologic Therapy*, 34: e15093, 2021a.
- Dash S, Sirka CS, Mishra S, Viswan P. COVID-19 vaccine-induced Stevens–Johnson syndrome. *Clinical Experimental Dermatology*, 46: 1615-1617, 2021b.
- Desai HD, Sharma K, Shah A, Patoliya J, Patil A, Hooshanginezhad Z, Grabbe S, Goldust M. Can SARS-CoV-2 vaccine increase the risk of reactivation of Varicella zoster? A systematic review. *Journal of Cosmetic Dermatology*, 20: 3350-3361, 2021.
- Doherty J, Fennessy S, Stack R, O' Morain N, Cullen G, Ryan EJ, De Gascun C, Doherty GA. Review Article: vaccination for patients with inflammatory bowel disease during the COVID-19 pandemic. *Alimentary Pharmacology Therapeutics*, 54: 1110-1123, 2021.
- Fiorillo G, Pancetti S, Cortese A, Toso F, Manara S, Costanzo A, Borroni RG. Leukocytoclastic vasculitis (cutaneous small-vessel vasculitis) after COVID-19 vaccination. *Journal of Autoimmunity*, 127: 102783, 2021.
- Green D, Lechner K. A survey of 215 non-hemophilic patients with inhibitors to factor VIII. *Thrombosis and Haemostasis*, 45: 200-203, 1981.
- Han X, Xu P, Ye Q. Analysis of COVID-19 vaccines: types, thoughts, and application. *Journal of Clinical Laboratory Analysis*, 35: e23937, 2021.
- Hirsiger JR, Martinez M, Tsakiris DA, Cittone MG, Graf L, Oldenburg J, Pezeshkpoor B, Recher M, Mueller J, Gerber B, Berger CT. Investigating potential mechanisms underlying FVIII inhibition in acquired hemophilia A associated with mRNA COVID-19 vaccines. *Journal of Thrombosis Haemostasis*, 20: 1015-1018, 2022.
- Kar BR, Singh BS, Mohapatra L, Agrawal I. Cutaneous small-vessel vasculitis following COVID-19 vaccine. *Journal of Cosmetic Dermatology*, 20: 3382-3383, 2021.
- Kharkar V, Vishwanath T, Mahajan S, Joshi R, Gole P. Asymmetrical cutaneous vasculitis following COVID-19 vaccination with unusual eosinophil preponderance. *Clinical Experimental Dermatology*, 46: 1596-1597, 2021.
- Kim MJ, Kim JW, Kim MS, Choi SY, Na JI. Generalized erythema multiforme-like skin rash following the first dose of COVID-19 vaccine (Pfizer-BioNTech). *Journal of the European Academy of Dermatology Venereology*, 36: e98-e100, 2022.
- Lemoine C, Giacobbe AG, Bonifacino E, Karapetyan L, Seaman C. A case of acquired haemophilia A in a 70-year-old post COVID-19 vaccine. *Haemophilia*, 28: e15-e17, 2022.
- Leone MC, Canovi S, Pilia A, Casali A, Depietri L, Fasano T, Colla R, Ghirarduzzi A. Four cases of acquired hemophilia A following immunization with mRNA BNT162b2 SARS-CoV-2 vaccine. *Thrombosis Research*, 211: 60-62, 2022.
- Lee JY, Lee JM, An S. Effects of consumer consumption value and psychological status on cosmetics repurchase

- behavior in the COVID-19 Era. *Asian Journal of Beauty and Cosmetology*, 19: 409-421, 2021.
- Li F, Li W, Farzan M, Harrison SC. Structure of SARS coronavirus spike receptor-binding domain complexed with receptor. *Science (New York.)*, 309: 1864-1868, 2005.
- Lim S, Kwon KH. Effects of oil/moisture changes after using herbal peeling therapy on women in their 20s and 30s with comedonal acne skin. *Asian Journal of Beauty and Cosmetology*, 18: 469-479, 2020.
- Mathieu E, Ritchie H, Rodés-Guirao L, Appel C, Giattino C, Hasell J, Macdonald B, Dattani S, Beltekian D, Ortiz-Ospina E, Roser M. Coronavirus Pandemic (COVID-19): Coronavirus (COVID-19) vaccinations. *Our World in Data*, 2020.
- Mansouri P, Chalangari R, Martits-Chalangari K, Mozafari N. Stevens-Johnson syndrome due to COVID-19 vaccination. *Clinical Case Reports*, 9: e05099, 2021.
- Mansouri P, Farshi S. A case of Steven-Johnson syndrome after COVID-19 vaccination. *Journal of Cosmetic Dermatology*, 21: 1358-1360, 2022.
- Memish ZA, Alharthy A, Alqahtani SA, Karakitsos D. COVID-19 air travel restrictions and vaccine passports: an ongoing debate. *Travel Medicine and Infectious Disease*, 42: 102049, 2021.
- Pereira B, Fehl AG, Finkelstein SR, Jiga-Boy GM, Caserotti M. Scarcity in COVID-19 vaccine supplies reduces perceived vaccination priority and increases vaccine hesitancy. *Psychology & Marketing*, 39: 921-936, 2022;
- Radwi M, Farsi S. A case report of acquired hemophilia following COVID-19 vaccine. *Journal of Thrombosis Haemostasis*, 19: 1515-1518, 2021.
- Shereen MA, Khan S, Kazmi A, Bashir N, Siddique R. COVID-19 infection: Origin, transmission, and characteristics of human coronaviruses. *Journal of Advanced Research*, 24: 91-98, 2020.
- Temiz SA, Abdelmaksoud A, Wollina U, Kutlu O, Dursun R, Patil A, Lotti T, Goldust M, Vestita M. Cutaneous and allergic reactions due to COVID-19 vaccinations: a review. *Journal of Cosmetic Dermatology*, 21: 4-12, 2021.
- Tiede A, Zieger B, Lisman T. Acquired bleeding disorders. *Haemophilia*, 27: 5-13, 2021.
- Vergara RJD, Sarmiento PJD, Lagman JDN. Building public trust: a response to COVID-19 vaccine hesitancy predicament. *Journal of Public Health (Oxf)*, 43: e291-e292, 2021.
- WHO IRIS (World Health Organization. Regional Office for Europe, Vaccination and trust: how concerns arise and the role of communication in mitigating crises), 2017.
- WHO (World Health Organization Emergency Committee, Statement on the second meeting of the International Health Regulations (2005) Emergency Committee regarding the outbreak of novel coronavirus (2019-nCoV). 2020a. 01. 30.
- WHO (World Health Organization, Draft landscape of COVID-19 candidate vaccines), 2020b.03.04
- Wijnans L, Voordouw B. A review of the changes to the licensing of influenza vaccines in Europe. *Influenza and Other Respiratory Viruses*, 10: 2-8, 2016.
- Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: summary of a report of 72314 cases from the Chinese center for disease control and prevention. *JAMA*, 323: 1239-42, 2020.

## 국문초록

### Covid-19 백신 접종 후 나타나는 피부 상태 반응 또는 다른 장애의 징후

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본 논문은 코로나19 범유행 이후 예방접종 후 피부 상태 변화에 초점을 맞춘 문헌을 검토하는 총설논문이다. 본 논문은 비판적 문헌 검토이며, 서술적 검토 접근법을 사용하여 본 연구를 진행하였다. PubMed, Google, Scholar, Scopus, ResearchGate 등 대표적인 저널 검색 사이트를 이용해 총 588편의 문헌을 선정했으며, 2021-2022년 기준 최종 단계에서 총 44편의 문헌이 선정되었다. 백신접종 후 부작용이 속출하고 있는 가운데 시간이 지나면 회복되는 경우도 있고 그렇지 않은 경우도 있다. 부작용 중 존슨 증후군, 혈우병 A, 그리고 혈관염 등 부분에서 간략하게 검토되었다. 코로나19펜데믹이 사람들을 위협에 빠뜨리고 있고, 이를 막기 위한 개발한 백신이 여러 가지 부작용 때문에 안전하지 않을 수 있다는 관점을 제기하였다. 본 연구는 새로운 백신 강화 기술의 개발에 대한 긍정적인 관점을 제공한다. 코로나19 근절을 위해서는 의료진과 의료정책뿐 아니라 환자 스스로의 적극적인 노력이 필요할 것이다.

**핵심어:** 백신, COVID-19, 존슨증후군, 혈우병, 혈관염

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## 참고문헌

안미정. 뷰티전공 대학생의 Covid-19에 대한 지식, 태도, 예방실천. *아시아뷰티화장품학술지*, 19: 459-466, 2021.

이지영, 이정민, 안성관. COVID-19 시대에 소비자 소비 가치와 심리상태가 화장품 재구매행동에 미치는 영향. *아시아뷰티화장품학술지*, 19: 409-421, 2021.

임수연, 권기한. 약초필링을 이용한 좁쌀여드름 관리가 20-30대 여성의 유·수분 변화에 미치는 영향. *아시아뷰티화장품학술지*, 18: 469-479, 2020.

## 中文摘要

### COVID-19 疫苗接种后皮肤状况或其他疾病的反应

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本文回顾了有关 COVID-19 大流行后接种疫苗后的皮肤状况变化的文献。这篇综述论文是一篇批判性文献综述, 本研究采用了叙述性综述方法。使用PubMed、Google Scholar、Scopus、ResearchGate等代表性期刊检索网站, 共筛选出588篇参考文献, 最终以2021-2022年为基准筛选出44篇论文。疫苗接种后的副作用很多, 一些随着时间的推移会恢复, 有些则不会。在 Johnson 综合症、获得性血友病 A和血管炎中对其进行了简要回顾。这个想法是, COVID-19 大流行使人们处于危险之中, 而预防它的疫苗可能并不安全。本文对开发新的疫苗增强技术提供了积极的看法。Covid-19不仅需要医务人员和医疗政策的积极努力, 还需要患者自身的积极努力。

**关键词:** 疫苗, COVID-19, 约翰逊综合征, 血友病, 血管炎

