

REVIEW ARTICLE

The COVID-19 pandemic and its impact on esthetic dermatology

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Abstract

In general, the world population interest has increased for maintaining youthfulness and having better appearance since this leads to a better mental wellbeing and self-estimate. The coronavirus disease 2019 (COVID-19) pandemic has revolutionized every field of medicine. As every specialty has been affected by limitations caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), this branch of medicine has also needed certain precautions for safer practice in the COVID era. With the global vaccination program against COVID-19, reports of some cutaneous reactions in patients have been undergone various esthetic procedures including filler or botox injection would be increasingly demonstrated. Although the end of pandemic was announced, the necessity of continuing COVID vaccination in future mandates gathering data regarding safety of vaccines. Herein, we presented a comprehensive review on various aspects of association between esthetic medicine or cosmetic dermatology and COVID-19.

KEYWORDS

COVID-19 vaccines, esthetic dermatology, filler reaction, immunologic reactions, SARS-CoV-2

1 | INTRODUCTION

Esthetic dermatology is an important branch of dermatology, which is being increasingly demanded by people all over the world. This includes procedures performed to rejuvenate the skin and other tissues of the body. The world of today is actually the world of cosmetic procedures. The increased awareness and interest of the world population about the cosmetic and esthetic medicine and the self-satisfaction induced by these interventions have been the causes of this increased demand.¹ With introduction of minimally invasive procedures and less need to open surgical interventions, this enthusiasm has further increased. The most prevalent cosmetic interventions include botulinum toxin and dermal fillers injection. The coronavirus disease 2019 (COVID-19) pandemic has revolutionized every field of medicine. As every specialty has been affected by limitations caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), this branch of medicine has

also needed certain precautions for safer practice in the COVID era.² Moreover, since cosmetic procedures and esthetic interventions are some kinds of luxurious life style, rather than a necessity, there have been a significant decline in the number of performed procedures in the beginning of the COVID pandemic.³ However, social distancing had led people spend long hours on video calls, which promoted appearance dissatisfaction and sometimes evolution of dysmorphic thoughts about the body especially the face; this has resulted in increased demand in esthetic and cosmetic procedures.^{4,5} On the other hand, the SARS-CoV-2 infection and associated vaccines have given rise to several dermatologic reactions in those individuals previously undergone cosmetic surgery or esthetic interventions.⁶⁻⁸ Moreover, demand for improving physical and mental self-acceptance usually increases after any disaster or crisis and COVID-19 is not an exception.⁹ It should be speculated that timely esthetic procedures such as botulinum toxin injections can affect the quality of life of people, thereby being a

psychological support in coronavirus days, when mental health may be disturbed.¹⁰

Here, we presented a comprehensive review on various aspects of association between esthetic medicine or cosmetic dermatology and COVID-19.

As mentioned above, any non-urgent surgery or dermatological procedures had been delayed or canceled in the beginning of the pandemic due to the fear of infection transmission. Most esthetic procedures necessitate close contact with the patients and this leads to increased risk of virus transmission.¹¹ Although this virus does not transmit through skin contact and blood borne routes, most elective cosmetic procedures like resurfacing lasers and dermatological surgeries had been deferred due to the unknown issues about their safety.¹² A considerable reduction in the number of minor cosmetic dermatological procedures like cryotherapy or filler injection was demonstrated in the beginning of the pandemic.¹³

In general, esthetic procedures are classified into three groups: noninvasive, minimally invasive, and invasive. Some examples of noninvasive procedures include cryolipolysis, laser lipolysis and electroporation. Botulinum toxin or filler injection, mesotherapy, microneedling, microblading, and carboxytherapy consist some of minimally invasive procedures; and liposuction, hair transplantation, and mechanical dermabrasion are invasive procedures. In the COVID era, the decision to undergo any procedure depends upon the degree of invasiveness, its urgency, and risk of viral transmission from the patient to the staff/clinician.^{2,14}

2 | COSMETIC AND DERMATOLOGIC SURGERY

Perhaps, esthetic surgery has been the most commonly affected field of surgery in the COVID pandemic; being nonurgent and non-vital, these types of surgeries had been immediately canceled in the lockdown period¹⁵; on the other hand, due to the change in the life style of the world population, including the sedentary living, obesity had become an increasing reason for bariatric or liposuction surgeries and the demand for plastic surgery had increased.¹⁶ However, on a general consensus on timing of surgeries in the COVID-19 pandemic, except in few cases, elective surgeries of any specialty, including dermatologic surgery, had been canceled during the strict quarantine in the beginning of the pandemic. Biopsy or excision of benign lesions like lipomas and cysts had all been deferred. Even some oncosurgeries like melanoma and other skin malignancies had been postponed in a short period in which great fear of developing SARS-CoV-2 infection surrounded the world population. Plastic surgeons had prioritized more aggressive forms of skin cancers, including melanomas, ulcerated skin cancers with the risk of hemorrhage, and skin metastases for surgery in the beginning of the COVID pandemic.^{17,18}

In those patients in need of urgent dermatologic or cosmetic surgery, COVID-19 infection should first be screened; only SARS-CoV-2 negative individuals are allowed to be operated.¹⁸⁻²⁰

3 | PRECAUTIONS FOR DERMATOLOGIC AND ESTHETIC PROCEDURES IN THE COVID ERA

Cosmetic and esthetic procedures, like any other medical and surgical intervention, needs patient and health care personnel interaction; hence, the risk of SARS-CoV-2 transmission should always be considered and appropriate precautionary measures should be taken accordingly. These measures should follow general principles of COVID-19 prevention recommended by the World Health Organization (WHO).²¹ In general, any asymptomatic patient attending the esthetic clinic should be considered a SARS-CoV-2 carrier unless proved otherwise; therefore, COVID-19 testing should better be performed in all patients coming for esthetic procedures as an initial screening test.

In addition to the need to comply with hand hygiene protocols and sanitize all the equipment used during a procedure, appropriate precautions should also be applied in order to minimize the infection spread.²² Every procedure needs its own special attentions. Noninvasive procedures need basic protection, which include wearing N95 respirator mask and latex/nitrile gloves. Minimally invasive procedures require moderate-to-advanced protection for which goggles and gowns are added to the basic protection. However, some of the invasive procedures necessitate extreme protection with face-shield and head and shoe covers added to the previously mentioned personal protective equipment (PPE).²³ The treatment area should have good ventilation. Windows should be opened after each procedure since SARS-CoV-2 survives up to 3 h in the air and opening the windows can disperse the infectious particles and decrease viral load of the surrounding environment. Negative pressure operating areas are recommended; however, these are better suited for surgical centers. It should be kept in mind that the risk of transmission is also higher in aerosol producing procedures and the ones with longer duration; hence, conversation between the clinician and the patient should be diminished; moreover, minimizing the duration of the procedures can also help in decreasing the risk of spread. However, viruses, including SARS-CoV-2 can survive up to 9 days on laser devices since they are made of stainless steel or have plastic handpieces, and this increases the risk of interpatients transmission; moreover, aerosolized particles are usually produced during some types of laser therapy, which harbors the risk of viral spread.^{10,14,24-26}

In the lockdown or strict social distancing period, individuals who have undergone esthetic procedures can be followed by tele-visits, both for evaluating the outcome of the procedure and enquiring about developing SARS-CoV-2 symptoms.²⁷

Diagnostic dermatological procedures such as dermatoscopy or skin biopsy should also should be avoided in any patient with suspected or confirmed COVID-19, unless urgently required.²⁸

Another important issue is the fact that few interactions between medical therapy of a COVID patient and esthetic procedures are identified; however, in COVID patients who are on immunosuppressive/immunomodulatory agents, invasive procedures should be deferred.²⁹

4 | SARS-COV-2 INFECTION RELATED ADVERSE EVENTS IN INDIVIDUALS UNDERGOING COSMETIC PROCEDURES

In general, dermal fillers, which are used for esthetic purposes, are produced with various formulations. Hyaluronic acid (HA) is a natural polysaccharide and the most commonly used tissue filler for dermal rejuvenation because of its better safety profile and the capability to be reversed by hyaluronidase enzymes.³⁰ The HA technologies, per se, are various, each with different viscosity and duration of lasting. The ones with more viscosity and durability are more susceptible to develop inflammatory reactions.⁶

As a matter of fact, SARS-CoV-2 infection has led to various dermatological reactions, which have included local to generalized cutaneous complications.^{31–33} Accordingly, with the universal increase in esthetic and cosmetic procedures, SARS-CoV-2 infection-associated reactions in body areas previously manipulated by dermatologists or plastic surgeons is an expectable issue. There have been several reports of cutaneous reactions in skin areas pretreated with cosmetic material. Induration, edema, tenderness, erythema, discoloration and nodule formation have been among the reported SARS-related reactions in the injection sites.^{34–36} However, dermatologic adverse events, such as granulomatous reaction and nodule formation, have been also reported following other esthetic procedures like platelet-rich plasma (PRP)/fat injection.³⁷ The underlying mechanism include the immunologic response to the viral spike protein and the resultant cutaneous reactions.³⁸

Despite bringing about much concern, most of the filler reactions following SARS-CoV-2 infection have been short-lasting and self-limiting. Therapeutic options that have been applied to control more prolonged or severe cases include antihistamines, nonsteroidal anti-inflammatory drugs (NSAIDs), corticosteroids, angiotensin converting enzyme (ACE) inhibitors like Lisinopril, colchicine, 5-fluorouracil and methotrexate. In addition, hyaluronidase can be used to dissolve and reverse HA fillers. In rare instances, surgical interventions like curettage, incision, and drainage have been necessary.^{38–40}

5 | COVID VACCINE-RELATED ADVERSE EVENTS IN INDIVIDUALS UNDERGOING COSMETIC PROCEDURES

The introduction of COVID vaccines has given rise to several dermatologic complications, including new-onset or flare up of various dermatoses^{41,42}; accordingly, the occurrence of vaccine-related adverse events was expected in body areas where esthetic procedures had been performed. Similar to COVID itself, COVID vaccination was also associated with dermatologic reactions in areas previously undergone tissue filler injection.^{43–46} These complications have included swelling, erythema and tenderness in the injected areas and lip angioedema. However, there have been rare reports of interaction between botulinum toxin and SARS-CoV-2 vaccination.⁴⁷

Not as common as filler injection site reactions, but reactions in body areas previously undergone cosmetic surgery has also been reported. Cosmetic breast augmentation is commonly performed in breast cancer patients who have undergone mastectomy. Moreover, capsular fibrosis and other esthetic purposes are the reason of breast implant surgery. Acute onset of breast implant seroma has been demonstrated after receiving COVID vaccine, which was attributed to the postvaccination immune response.⁴⁸

These reactions are believed to be the result of vaccine adjuvants, which lead to autoimmune/inflammatory syndrome induced by adjuvants (ASIA)⁴⁹; however, the interaction between the skin ACE-2 receptors and the vaccine's spike protein can also be an underlying mechanism.³⁶ Most of the vaccine-induced reactions in previously cosmetically manipulated areas are tardive reactions, which take place with delay, usually within 10 days after vaccination. However, these so-called adverse events have been reported even after 1 year of esthetic procedure.^{6,50} These adverse events may increase the hesitancy to get vaccinated against SARS-CoV-2; therefore, a dermatologist and an infectionist consultation is mandatory to assure the population of the temporary and self-limiting characteristic of these reactions and that these adverse events should never ban them from getting the second vaccine dose. The main strategy to prevent such reactions is to space enough time between vaccination and the planned dermatologic procedures; there is no consensus on the time span of safety; however, at least 3–4 weeks seems to be reasonable, with longer lag for those with a previous history of sensitivity to tissue fillers or those with autoimmune disorders or on immunosuppressive agents. Moreover, pretreating with antihistamines or corticosteroids can sometimes be beneficial in preventing vaccine-induced tissue filler reactions.⁵⁰ Breast implant reactions after COVID-19 vaccination has been managed conservatively with NSAIDs, opioids, cryotherapy and sometimes implant removal and oral or parenteral antibiotics.⁵¹

6 | CONCLUSION

Dermatologists and infectious diseases specialists have interacted greatly in the COVID pandemic, both because of the transmission risk of SARS-CoV-2 during cosmetic and esthetic procedures and also the adverse events associated with these procedures in individuals infected with or vaccinated against SARS-CoV-2. Therefore, dermatologists should apply to all precautionary measures in order to minimize the potential risks of viral transmission; furthermore, they should report and, if necessary, consult about any unusual reaction in pretreated areas of the body undergone cosmetic procedures in individuals with a history of SARS-CoV-2 infection or COVID-19 vaccination.

AUTHOR CONTRIBUTIONS

Parvaneh Hatami, Shahin Hamzelou, Amirhooshang Ehsani, and Zeinab Aryanian performed the research. Zeinab Mohseni Afshar and Zahra Razavi designed the research study. Amirhooshang Ehsani

and Parvaneh Hatami supervised the findings of this work. All authors discussed the results. Zeinab Mohseni Afshar wrote the initial draft. Shahin Hamzelou and Zeinab Aryanian wrote the revised version. All authors contributed to the preparation of data and finalization of this article.

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CONFLICT OF INTEREST

All the authors declare that there is no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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