SPECIAL ARTICLE

Coronavirus Disease of 2019 (COVID-19) Facts and Figures: What Every Dermatologist Should Know at this Hour of Need

Yashpal Manchanda, Sudip Das1, Abhishek De1

Abstract

Coronavirus disease of 2019 (COVID-19) pandemic has affected India and the world as a whole, like nothing in the recent history and we, dermatologists, are also affected directly or indirectly. In this review, we have tried to address the COVID-19-related information we need to be aware of as a health-care professional. We have discussed the relevant details of the disease: the agent, the symptomatology, common preventive measures, investigations, and management outline. We have also discussed the implications of COVID-19 in dermatology practice and given a basic guideline for dermatology practice during the pandemic.

KEY WORDS: COVID-19, dermatologist, severe acute respiratory syndrome coronavirus type-2 (SARS-CoV-2)

Prelude

COVID-19 (coronavirus disease of 2019) pandemic is surely once in a lifetime unprecedented crisis situation, likely to be faced by any human being. And, not even a single person living currently on this earth is going to be left untouched by the ill effects of this novel coronavirus. Many of us are likely to catch the infection. Even if some of us are lucky enough to be able to escape at the end, none of us would be able to avoid the indirect consequences, for sure. In the current situation, it becomes more relevant due to the fast-spreading pandemic nature of the disease causing unimaginable load of serious COVID-19 positive cases, which overwhelms the available health-care resources much sooner than anyone anticipated, even in the countries with some of the world’s best health-care facilities. Thus, the situation has generated the need to pool in health-care workers from other specialties including dermatology, to extend helping hand in this crisis situation.

In this review we have tried to address the COVID-19-related information each one of us need to be aware of, not only as a dermatologist, but also as a health-care worker and of course as a common man, to equip each one of us better, to face this threat head on, and come out victorious.

Introduction

Coronavirus disease of 2019 (COVID-19) is a viral infection caused by severe acute respiratory syndrome coronavirus type 2 (SARS-CoV-2). It was first reported from capital city of Wuhan in Hubei province of China towards the end of year 2019. And, since then in a short span of 3 months, it has eventually spread to more than 200 countries in the world, and thus culminating into the ongoing 2019–20 coronavirus pandemic. On January 30, 2020, the World Health Organization (WHO) first declared it a Public Health Emergency of International Concern (PHEIC) and within few weeks realized the imminent threat to the whole world to declare it a “Pandemic” on March 11, 2020. It is commonly characterized by fever, cough, and dyspnea. Other symptoms reported uncommonly associated with it include malaise, muscle pain, nausea, vomiting, diarrhea, sore throat, loss of smell, and abdominal pain. Although vast majority (more than 90%) of the cases report mild or even no symptoms, approximately 10% are believed to require hospitalization, and few of the hospitalized cases progress to develop severe pneumonia and eventually
multiorgan failure, and require intensive care with external support to vital organs.[8,9]

**The Virus**
SARS-CoV-2 is a novel severe acute respiratory syndrome coronavirus, basically an enveloped RNA beta coronavirus closely related to the original SARS-CoV.[10]

**Transmission**
Its main mode of spread is through close contact and by small droplets released into the air during coughing, sneezing, and even talking by the infected individuals.[11] Cases of asymptomatic transmission have also been reported.[12,13]

**Incubation Period**
On an average, it takes about 5 days for the first symptom to manifest, but the incubation period may vary from 2 to 14 days. The virus has been shown to have median Ro (Basic Reproduction Number) of 3.7 days,[14] which basically means average number of people who can catch the virus from a single infected person. It has been shown to be most contagious when people are symptomatic.[15]

**Diagnosis**
Real-time reverse transcription polymerase chain reaction (rRT-PCR) from a nasopharyngeal swab is generally used as a standard diagnostic method for the diagnosis of active infection.[16] The results of these tests can generally be available within a few hours (4–6 h) to 2 days. Serum-based antibody tests are relatively faster and report can be available between 15 min and 2 h. However, it does not become positive early on in the course of the disease, and have high false negative rates. But, they serve as useful tool to detect previous infections (which RT-PCR fails to detect), and can be deployed for rapid surveillance of population.[17] Along with laboratory testing, chest computed tomography (CT) scans may help to diagnose COVID-19 in cases with a high clinical suspicion of infection, but is not recommended for routine screening. In early infection, the scan can reveal bilateral multilobar ground-glass opacities with a peripheral, asymmetric, and posterior distribution.[18]

**Common Preventive Measures**
Considering the fact that no vaccine to prevent the infection is yet available for commercial use, it can only be controlled from spreading to others by taking certain preventive measures including frequent hand washing (the CDC recommends to wash hands often with soap and water for at least 20 s, especially after going to the toilet, before eating, and after blowing one’s nose, coughing, or sneezing; it further recommends using an alcohol-based hand sanitizer with at least 60% alcohol, but only when soap and water are not readily available), social distancing[19] (maintaining physical distance from others), covering coughs and sneezes with a tissue or inner elbow, and keeping unwashed hands away from the face. The use of masks by everyone, when outside is also believed to limit its spread and has been recommended by many countries.[20]

**Management**
At the moment, there is no definitive treatment available, and current management includes basic supportive care (it includes fluid therapy, oxygen support, and support to failing vital organs), symptomatic treatment, isolation, and certain experimental therapeutic measures, such as antimalarials, antiviral drugs, antibiotics, BCG vaccination, convalescent plasma therapy to name a few.

In the absence of an effective antiviral agent against COVID-19, it becomes imperative to reposition drugs for their antiviral activities in dire situations on a case to case basis in critically ill patients.[21]

1. **Oxygen support**: In milder cases, oxygen is supplied by regular nasal cannula. However, severe cases require mechanical ventilation. Reports suggest that respiratory failure in critically ill patients can be given assisted ventilation through high flow nasal cannula or bi-level positive airway pressure, thereby avoiding the need of intubation.[22] However, some doctors still prefer using invasive mechanical ventilation, because it limits the spread of aerosols as compared to a high flow nasal cannula.[23] With the development of acute respiratory distress syndrome, the oxygenation becomes difficult even with the above mentioned means, and ventilators with pressure control modes and high PEEP (positive end expiration pressure) are required.[24]

2. **Medications**: For symptomatic relief, experts recommend to use paracetamol as first-line agent.[25] Blood thinners have been suggested for treatment and anticoagulant therapy with low-molecular-weight heparin has been used with some success in severe COVID-19 presenting with elevated D-dimer levels.[26] Antiviral agents: Of the several antiviral drugs currently undergoing human trials, remdesivir has been shown to possess the most promising results of them all. However, so far the experts have recommended their use to be limited to only critically ill patients.[27]

Antimalarials drugs: At the moment at least seven different trials are evaluating the use of already approved antimalarial drugs in the management of COVID-19, including four studies on hydroxychloroquine or chloroquine. Health regulatory authorities of many nations including India, China, Italy and South Korea have recommended their use.
More recently, U.S. FDA also issued an emergency use authorization (EUA) for hydroxychloroquine and chloroquine at the discretion of physicians treating people with COVID-19. These drugs have also been recommended by Indian health authorities for prophylactic use in health-care workers (HCWs) with high risk of exposure to COVID-19.

**Antibiotics:** Initial reports from China claimed effectiveness of azithromycin in combination with antimalarial agents. However, subsequent studies have shown major limitations especially cardiac adverse effects, and that have prevented the medical community from adopting these therapies without further studies.

**IL-6 Inhibitors:** A small study from China showed the efficacy of an IL-6 inhibitor drug tocilizumab. It has been included in treatment guidelines by China's National Health Commission. Also, group of researchers from Italy are currently evaluating its role in treating the severely ill patients reported to have a cytokine storm.

**Passive antibody therapy:** Researchers in several countries are currently evaluating the role of transferring purified and concentrated antibodies produced by those who have recovered from COVID-19 to people who need them, as a non-vaccine method of creating passive immunity.

**Vaccine:** Currently there is no available vaccine for prevention. However, scientists from across the world are racing against time to develop one. And, first clinical trial of the vaccine in humans has already started in the USA. But, any kind of vaccine is unlikely to be available before 2021, even by the most optimistic estimate.

3. **Psychological support:** In the absence of effective therapeutic tool, and relative success of highly restrictive measures to contain the infection; the population in many parts of the world has been subjected to prolonged “lockdown”. It has resulted in individuals experiencing tremendous mental stress from loss of jobs, pay cuts, closure of business, forced quarantine, stringent travel restrictions, and fear of the infection itself. On the contrary, front-line workers including health care workers (HCWs), police, and sanitation workers are in addition experiencing work-related stress, apart from higher risk of infection. Thus, a strong psychological support mechanism is needed to deal with this psychological crisis.

**Pathophysiology**

Lungs are the single most severely affected organs by COVID-19, because the virus enters the host cells via the enzyme ACE2 (angiotensin-converting enzyme 2) receptor, most abundantly found in the type II alveolar cells. The virus uses a special surface glycoprotein called a “spike” to attach to ACE2 receptor and gain access to the host cell.

The virus is also known to affect gastrointestinal organs, because ACE2 receptor is abundantly expressed in the glandular cells of gastric, duodenal, and rectal epithelium as well as endothelial cells and enterocytes of the small intestine.

In the cardiovascular system, it causes acute injury to myocardium. And this type of acute myocardial injury has been seen in approximately 12% of patients hospitalized with COVID-19 infection, and was more commonly found in those, who were critically ill and required supportive therapy. This has again been thought to be due to ACE2 receptors present in the myocardial tissue. Also reported in the critically ill patients are the higher incidences of thrombosis (31%) and venous thromboembolism (25%), which are poor prognostic indicators.

**Pathology**

Not enough data are currently available about the microscopic changes occurring in various organs due to COVID-19 infection. Some of the characteristic findings observed in the specimens obtained during autopsy are as follows:

- **Lungs:** According to the severity of lung involvement, four types of viral pneumonia can be seen:
  - **Minor pneumonia:** It shows minor serous exudation and minor fibrin exudation.
  - **Mild pneumonia:** It is characterized by pulmonary edema, pneumocyte hyperplasia, large atypical pneumocytes, interstitial inflammation with lymphocytic infiltration, and multinucleated giant cell formation.
  - **Severe pneumonia:** Diffuse alveolar damage (DAD) with diffuse alveolar exudates. DAD leads to acute respiratory distress syndrome (ARDS) and severe hypoxemia.
  - **Healing pneumonia:** Organization of exudates in alveolar cavities and pulmonary interstitial fibrosis, and plasmocytosis in BAL

- **Blood:** Disseminated intravascular coagulation (DIC) and leukoerythroblastic reaction may occur.

- **Liver:** Microvesicular steatosis is seen

**Prognosis**

The disease in majority of cases has a mild course with minimal or no symptoms, resembling flu, and they all typically recover within 2 weeks, whereas those with severe or critical disease (approximately 5%) may take 3–6 weeks to recover. It has been observed that men are more prone to death (National Health Commission of China report showed that men had a death rate of 2.8%,
whereas women had a death rate of 1.7%). Children are also susceptible to get the infection, but are more likely to have milder symptoms and a much lower chance of severe disease when compared to adults; in cases in age group of less than 50 years, the mortality rate is estimated to be less than 0.5%, whereas in cases older than 70 years of age, the mortality rates are as high as 8%. Another important factor strongly associated with higher mortality is the presence of comorbid conditions, with many of those who die have been reported to have preexisting underlying conditions, including hypertension, diabetes mellitus, and cardiovascular disease. According to one published report from Italy, of 8.8% of the total deaths for which medical records could be reviewed, 97.2% had at least one comorbid condition, with an average each patient had 2.7 diseases.

Reinfection
It is not clearly known if past infection leads to effective long-lasting immunity. But, recently some patients having completely recovered from COVID-19 have been reported to have again become positive when tested at later date. However, some researchers have suggested it to be possibly due to reactivation of the virus, rather than reinfection.

Prevention
The preventive measures, such as staying at home, avoiding crowded places, washing hands with soap and water often and for at least 20 s, practicing good respiratory hygiene, and avoiding touching the eyes, nose, or mouth with unwashed hands, have been advocated for the general population. The HCWs are required to take extra measures because of the relatively higher risk of exposure to virus inherent to their occupation. It includes the following:

**Personal Protective Equipment (PPE)**
Complete precautions must be taken to minimize the risk of virus transmission from undiagnosed or known positive COVID-19 cases, especially in health-care settings when performing procedures that can generate aerosols, such as intubation or hand ventilation. For the health-care professionals caring for people with COVID-19, the CDC recommends placing the person in an airborne infection isolation room (AIIR), in addition to using standard precautions, contact precautions, and airborne precautions.

According to CDC’s specific guidelines outlining the use of personal protective equipment (PPE) during the pandemic, the recommended gear should include the following:
- Respirator or face mask
- Gown
- Medical gloves
- Eye protection.

When available, respirators (instead of face masks) are preferred. N95 respirators are approved for industrial settings but the FDA has authorized the masks for use under an EUA. They are designed to protect from airborne particles like dust but effectiveness against a specific biological agent is not guaranteed for off-label uses. When masks are not available, the CDC recommends using face shields or, as a last resort, homemade masks.

**Implications for a Dermatologist**
Although the virus is not typically associated with any particular or characteristic known skin manifestations, reports have started trickling in of certain morphological skin lesions being increasingly seen in COVID-19 positive cases, from various parts of the world. These dermatoses are now being thought to be associated with COVID-19 infection, as also noticed with other respiratory viruses such as SARS and MERS in the past.

In brief, the range of issues likely to be faced by dermatologists in this COVID-19 pandemic can be broadly subdivided into four categories as follows:

**A. Dermatosis in COVID-19 positive cases:**
Skin manifestations were observed in about one-fifth of a group of patients with COVID-19 in Alessandro Manzoni Hospital in Lecco, in northern Italy. Of the 88 COVID-19 patients, 20.5% developed skin manifestations. Eight of the 18 (44%) had skin eruptions at the beginning of the symptoms, and the rest of the patients developed skin lesions in the hospital after admission. Majority of the patients (14/18; 78%) had maculopapular rashes, three had widespread urticarial wheals, and one had chickenpox-like vesicles. The most commonly affected area was the trunk. Itching was mild or absent, and lesions usually healed in a few days. Most importantly, it was noted that the skin manifestations did not correlate with disease severity.

Another group of physicians from Thailand described a case of a COVID-19 infection in a Bangkok hospital that masqueraded as dengue fever. The patient had presented with only a skin rash, petechiae, and a low platelet count, and was diagnosed initially as a case of Dengue because that’s exactly what it looked like. However, subsequently on testing for COVID, it was found to be positive.

Also, COVID-19 cases have been seen to present with signs clinically suggestive of small blood vessel occlusion. And, these can be in the form of petechiae or tiny bruises, transient livedoid eruptions, or acral ischemia presenting as perniosis like lesions. It suggests vaso-occlusion. Whether it is because of neurogenic cause, due to microthrombotic, or...
immune complex mediated is not exactly clear at the moment. But, could surely be a skin sign that can help physicians to recognize COVID-19 cases early on, as they work up their patients with suspected COVID-19 symptoms.

B. Management of patient taking systemic immunosuppressive agents: Another important concern for a dermatologist is the care for patients with autoimmune and chronic inflammatory disorders, such as psoriasis, atopic dermatitis, connective tissue diseases, and hidradenitis suppurativa, who are being treated with either biologic drugs or immunosuppressants. European Task Force Dermatology published Specific Guidelines to address that specific concern which are as follows:

- To continue all immune-modulating treatments, including immuno-suppressive therapy; as exacerbations of underlying diseases may have a large negative impact on patients’ mentality
- To strictly follow the recommendations for patients at risk issued by the local health authorities of each country.
- To carefully observe hygienic procedures using handwash and disinfectants. Non-irritant soap substitutes to be used in the same way as directed for soap. Moisturizers should be applied afterwards.
- Severe and untreated AD is a known risk factor for disseminated viral skin disease. On the contrary, many conventional systemic immune-modulating agents, such as cyclosporine, may interact with the human body defense mechanisms against viral disease. We currently do not know how SARS-CoV-2 affects patients with AD and specifically those on immune-modulating therapies.
- Disseminated viral skin infections, such as eczema herpeticum, herpes zoster infection, or seasonal nasopharyngitis observed in patients with AD could serve as potential model diseases for estimating the handling of SARS-CoV-2 infection by patients with AD on systemic therapy, but the conclusions which can reasonably be drawn are very limited.
- Targeted treatment selectively interfering with type 2 inflammation, such as dupilumab, is not considered to increase the risk for viral infections and might thus be preferred compared to conventional systemic immunosuppressive treatments, such as cyclosporine, in a situation such as the COVID-19 pandemic. However, this theoretical advantage is not supported by robust clinical data.

C. Anti-COVID-19 Drug Therapy-Related Issues: The drug interactions or adverse cutaneous drug reactions noticed in COVID-19 positive patients being treated with experimental agents or even the high-risk groups, such as HCWs being given prophylactic anti-COVID-19 drugs, such as antimalarials. It has to be kept in mind that antimalarial agents, such as chloroquine and hydroxychloroquine, and also some of the NSAID drugs can aggravate preexisting psoriasis. In a study done on 20 patients, authors reported 7 patients with a maculopapular exanthema (with edema of the face in 1 patient), 6 patients of acute generalized exanthematous pustulosis (AGEP), 3 had photosensitivity with light-induced exanthem, 2 developed urticaria, and 2 patients had other CADR—an drug reaction with eosinophilia and systemic symptoms (DRESS) and a DRESS/AGEP overlap. Some cases of purpuric eruption, reticularis such as photo-distributed livedo, lichenoid photo-dermatitis, and photo-distributed lichen planus were also described.

D. Personal Protection Equipments (PPE)-Induced Conditions: Emerging reports have shown higher incidence of certain group of dermatoses, mainly related to prolonged contact to personal protective equipment, and excessive personal hygiene. Erythema, papules, maceration, and scaling are the most commonly reported skin changes due to prolonged use of PPE. Symptoms have included burning, itching, and stinging. Such findings have been attributed to the use of PPE in 97.0% of 542 frontline HCWs. The most commonly affected skin sites were the nasal bridge (83% due to the use of protective goggles but not the hygiene mask), cheeks, forehead, and hands. The prolonged contact with masks and goggles may cause a variety of dermatoses ranging from pressure injury, contact dermatitis, pruritus, pressure urticaria. Also, exacerbation of pre-existing skin diseases like seborrheic dermatitis and acne, has been noticed. An earlier study pointed out that more than 1/3 of HCWs complained of acne, facial itching, and even dermatitis from wearing an N95 mask. The use of protective hats and the accompanying occlusions may induce pruritus and folliculitis or exacerbate seborrheic dermatitis. Long-term use of protective gloves leads to occlusion and a hyper-hydration state of the epidermis clinically observable as maceration and erosions, possibly leading to the development of contact dermatitis. Exaggerated hand washing with detergents/disinfectants can impair the hydro-lipid mantle of the skin surface and may also be responsible for irritation and even the development of contact dermatitis. Two-thirds of HCWs will wash their hands over 10 times a day, but hardly one fifth are using skin protective cream.

E. Dermatology Practice during COVID-19 pandemic:
  1. Screening at the Entrance: To limit the number of patients attending the clinic, special emphasis should be given to tele-dermatology. Nursing staff/counselor with personal protective
equipment should screen each patient with Infrared thermometer before the entrée to clinic possibly in triage room. Each person entering should be asked to fill self-declaration form regarding travel history and relevant symptoms. Entrée of accompanying person with each patient should be restricted to the absolute minimum. Use of hand sanitizer should be mandatory for each person before entering the clinic. Each patient and accompanying person should wear masks before entering the clinic.

2. **Waiting room:** Strict prefixed appointment timings should be maintained to keep the waiting area as less crowded as possible. A minimum distance of 1 m to be maintained between each person sitting in the waiting room.

3. **Consultation:** The consultant should keep in mind social distancing, and should restrict close examination to minimum. Protective goggles; N95 mask or surgical mask, and gloves should be mandatory for the dermatologists even during routine consultations. High contact items like pens, pads, table surface, chair, door handles etc., should be sanitized after each patient’s visit. Use of dermatoscope should be restricted to most essential cases as it requires close inspection.

4. **Procedure:** Nonessential procedure and those generating plume (such as carbon peels) should be deferred wherever possible. All instruments including dermatoscope, lasers should be cleaned with 1% sodium hypochlorite solution or 70% ethyl alcohol after each procedure, as applicable.

**Conclusion**

The skin and COVID-19 interactions, as well as the consequences to the skin and mucous membranes of increased personal hygiene measures, should be recognized by dermatologists and their coworkers. The use of preventive measures, including emollients, barrier creams, and moisturizers, is essential in preventing skin complications aggravated by preventive measures during the pandemic.

**Financial support and sponsorship**

Nil.

**Conflicts of interest**

There are no conflicts of interest.

**References**

1. Coronavirus disease 2019 (COVID-19)-Symptoms and causes. Mayo Clinic. [Retrieved on 2020 Apr 14].
2. Hui DS, I Azhar E, Madani TA, Ntoumi F, Kock R, Dar O, et al. The continuing 2019-nCoV epidemic threat of novel coronaviruses to global health—The latest 2019 novel coronavirus outbreak in Wuhan, China. Int J Infect Dis 2020;91:264-66.
3. WHO Director-General’s opening remarks at the media briefing on COVID-19. World Health Organization (WHO) (Press release). 11 March 2020. Archived from the original on 11 March 2020. [Retrieved on 2020 Mar 12].
4. Statement on the second meeting of the International Health Regulations (2005) Emergency Committee regarding the outbreak of novel coronavirus (2019-nCoV). World Health Organization (WHO). Archived from the original on 31 January 2020. [Retrieved on 2020 Feb 11].
5. Symptoms of Coronavirus. U.S. Centers for Disease Control and Prevention (CDC). 2020. Archived from the original on 30 January 2020.
6. Q and A on coronaviruses. World Health Organization. 2020. Archived from the original on 20 January 2020. [Retrieved on 2020 Apr 12].
7. Hopkins C, Kumar N. Loss of sense of smell as marker of COVID-19 infection. ENT UK. Available from: https://www.entuk.org/sites/default/files/Loss%20of%20smell%20as%20marker%20of%20COVID.pdf. [Retrieved on 2020 Mar 28].
8. Heymann DL, Shi ndo N, WHO Scientific and Technical Advisory Group for Infectious Hazards. COVID-19: What is next for public health? Lancet 2020;395:542-5.
9. Cascella M, Rajnik M, Cuomo A, Dulebohn SC, Di Napoli R. Features, Evaluation and Treatment Coronavirus (COVID-19). StatPearls. Treasure Island (FL): StatPearls Publishing; 2020. PMID 32150360. [Retrieved on 2020 Mar 18].
10. Andersen KG, Rambaut A, Lipkin WI, Holmes EC, Garry RF. The proximal origin of SARS-CoV-2. Nat Med 2020;26:450-2.
11. How COVID-19 Spreads? Centers for Disease Control and Prevention (CDC). 2020. Archived from the original on 3 April 2020. [Retrieved on 2020 Apr 03].
12. Bai Y, Yao L, Wei T, Tian F, Jin DY, Chen L, et al. Presumed asymptomatic carrier transmission of COVID-19. JAMA 2020. doi: 10.1001/jama.2020.2565.
13. Yu P, Zhu J, Zhang Z, Han Y, Huang L. A familial cluster of infection associated with the 2019 novel coronavirus indicating potential person to person transmission during the incubation period. J Infect Dis 2020. doi: 10.1093/infdis/jiaa077. Coronavirus disease 2019 (COVID-19) Situation Report—73 (PDF). World Health Organization. 2 April 2020. [Retrieved on 2020 Apr 03].
14. Sanche S, Lin YT, Xu C, Romero-Severson E, Hengartner N, Ke R. Early Release—High contagiousness and rapid spread of severe acute respiratory syndrome coronavirus 2. Emerg Infect Dis J 2020;26. doi: 10.3201/eid2607.200282.
15. Imperial College London, MRC Centre for Global Infectious Disease Analysis. News/COVID-19—Report 3: Transmissibility of 2019-nCoV. Available from: https://www.imperial.ac.uk/mrc-global-infectious-disease-analysis/ysis/news-wuhan-coronavirus/. [Last accessed on 2020 Mar 05].
16. Interim Guidelines for Collecting, Handling, and Testing Clinical Specimens from Persons for Coronavirus Disease 2019 (COVID-19). Centers for Disease Control and Prevention (CDC); 2020. Archived from the original on 4 March 2020. [Retrieved on 2020 Mar 26].
17. Vogel G. New blood tests for antibodies could show true scale of coronavirus pandemic. Science 2020. doi: 10.1126/science.abb8028.
18. Salehi S, Abedi A, Balakrishnan S, Gholamreza nezhad A. Coronavirus Disease 2019 (COVID-19): A Systematic Review of Imaging Findings in 919 Patients. Am J Roentgenol 2020;1-7. doi: 10.2214/AJR.20.23034.
Manchanda, et al.: COVID‑19 facts and figures

19. Maragakis LL. Coronavirus, Social Distancing and Self Quarantine. Johns Hopkins University; 2020. Available from: www.hopkinsmedicine.org. Archived from the original on 18 March 2020. [Retrieved 2020 on Mar 18].

20. CDC. Recommendation Regarding the Use of Cloth Face Coverings, Especially in Areas of Significant Community‑Based Transmission. Centers for Disease Control and Prevention. [Retrieved on 2020 Apr 17].

21. Sanders JM, Monogue ML, Jodlowski TZ, Cuthrell JB. Pharmacologic treatments for coronavirus disease 2019 (COVID‑19): A review. JAMA 2020. doi: 10.1001/jama.2020.6019.

22. McEnery Tom; Gough, Ciara; Costello, Richard W. COVID‑19: Respiratory support outside the intensive care unit. Lancet Respir Med 2020. doi: 10.1016/S2213‑2600 (20) 30176‑4.

23. Murthy S, Gomensorl CD, Fowler RA. Care for critically ill patients with COVID‑19. JAMA 2020. doi: 10.1001/jama.2020.3633. PMID 32159735. Archived from the original on 18 March 2020. [Retrieved on 2020 Mar 18].

24. Briel M, Meade M, Mercat A, Brower RG, Talmor D, Walter SD, et al. Higher versus lower positive end‑expiratory pressure in patients with acute lung injury and acute respiratory distress syndrome. JAMA 2010;303:865‑73.

25. U S Food & Drug Administration. FDA advises patients on use of non‑steroidal anti‑inflammatory drugs (NSAIDs) for COVID‑19. Drug Safety and Availability. Archived from the original on 27 March 2020. [Retrieved on 2020 Mar 27].

26. Tang N, Bai H, Chen X, Gong J, Li D, Sun Z. Anticoagulant treatment is associated with decreased mortality in severe coronavirus disease 2019 patients with coagulopathy. J Thromb Haemost 2020. doi: 10.1111/jth.14817.

27. Li G, De Clercq E. Therapeutic options for the 2019 novel coronavirus (2019‑nCoV). Nat Rev Drug Discov 2020;19:149‑50. doi: 10.1038/s41573‑019‑00548‑0. PMID 30319036.

28. Hinton DM. Request for Emergency Use Authorization for Use of Chloroquine Phosphate or Hydroxychloroquine Sulfate Supplied From the Strategic National Stockpile for Treatment of 2019 Coronavirus Disease. U.S. Food and Drug Administration; 2020. Archived from the original on 30 March 2020. [Retrieved on 2020 Mar 30].

29. Gao J, Tian Z, Yang X. Breakthrough: Chloroquine phosphate has shown apparent efficacy in treatment of COVID‑19 associated pneumonia in clinical studies. Biosci Trends 2020;14:72‑3.

30. Effective Treatment of Severe COVID‑19 Patients with Tocilizumab. ChinaXiv.org. 2020. doi: 10.12074/202003.00026. Archived from the original on 19 March 2020. [Retrieved on 2020 Mar 14].

31. Coulthard M, Pyle M, Hrebienok K, Khara A, Ayoub F, Choo TH, et al. Mortality of coronavirus disease 2019 (COVID‑19) in adults: systematic review and meta‑analysis. BMJ 2020;369:m1548. doi: 10.1136/bmj.m1548. PMID 32198191.

32. McEnery Tom; Gough, Ciara; Costello, Richard W. COVID‑19: Respiratory support outside the intensive care unit. Lancet Respir Med 2020. doi: 10.1016/S2213‑2600 (20) 30176‑4.

33. Roberts M. Coronavirus: US volunteers test first vaccine. BBC News 2020. Archived from the original on 17 March 2020. [Retrieved on 2020 Mar 17].

34. Kang L, Li Y, Hu S, Chen M, Yang C, Yang BX, et al. The mental health of medical workers in Wuhan, China dealing with the 2019 novel coronavirus. Lancet Psychiatry 2020;7:e14.

35. Letko M, Marzi A, Munster V. Functional assessment of cell entry and receptor usage for SARS‑CoV‑2 and other lineage B betacoronaviruses. Nat Microbiol 2020;5:562‑9.
53. Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: A descriptive study. Lancet 2020;395:507-13.

54. Recalcati S. Cutaneous manifestations in COVID-19: A first perspective. J Euro Acad Dermatol Venereol doi: 10.1111/jdv.16387.

55. Joob B, Wiwanitkit V. COVID-19 can present with a rash and be mistaken for Dengue. J Am Acad Dermatol 2020;82:e177.

56. Manalo IF, Smith MK, Cheeley J, Jacobs R. A dermatologic manifestation of COVID-19: Transient livedo reticularis. J Am Acad Dermatol 2020. doi: 10.1016/j.jaad.2020.04.018.

57. Rademaker M. Advice regarding COVID-19 and use of immunomodulators, in patients with severe dermatological diseases. Australas J Dermatol 2020. doi: 10.1111/ajd.13295.

58. Safe Prescribing and Monitoring Protocol for Systemic immunomodulatory therapies for immune-mediated inflammatory skin disease in the context of Coronavirus (COVID-19) Key Considerations. 2020. Available from: http://www.bad.org.uk/health-care-professionals/covid-19/covid-19-immuno-suppressed-patients/. [Last accessed on 2020 Apr 01].

59. Andreas Wollenberg and Jacob Pontoppidan Thyssen. European Task Force on Atopic Dermatitis (ETFAD) statement on severe acute respiratory syndrome coronavirus 2 (SARS-Cov-2)-infection and atopic dermatitis. doi: 10.1111/jdv.16411.

60. Soria A, Barbaud A, Assier H, Avenel-Audran M, Têtart F, Raison-Peyron N, et al. Cutaneous adverse drug reactions with antimalarials and allergological skin tests. Dermatology 2015;231:353-9.

61. Foo CC, Goon AT, Leow YH. Adverse skin reactions to personal protective equipment against severe acute respiratory syndrome—A descriptive study in Singapore. Contact Dermatitis 2006;55:291-4.

62. Joob B, Wiwanitkit V. COVID-19 in medical personnel: Observation from Thailand. J Hosp Infect 2020. pii: S0195-6701(20)30090-6. doi: 10.1016/j.jhin.2020.02.016.

63. Elston DM. Letter from the Editor: Occupational skin disease among health care workers during the coronavirus (COVID-19) epidemic. J Am Acad Dermatol 2020;82:1085-6.