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Recommendations for Pediatric Dermatology Practice during COVID-19 Pandemic

Abstract

The current scenario of the coronavirus disease (COVID-19) pandemic has resulted in a huge disease burden worldwide affecting people across all age groups. Although children get infected by coronavirus, they are less commonly affected. Only 2% of cases are being reported among patients aged less than 20 years of age and childhood cases constitute around 1–5% of them. Moreover, they are less likely to be seriously affected when compared to adults, with more than 90% of them being either asymptomatic or having mild to moderate disease. This could be attributed to less exposure or sensitivity to COVID-19, varying immune response mechanisms, differences in the expression/function of the Angiotensin Converting Enzyme 2 receptors or higher antibody levels to viruses owing to exposures to multiple respiratory infections, protective role of measles and BCG vaccine, and few associated comorbidities. However, children with certain underlying medical conditions like cardiac or respiratory disease, diabetes, immunodeficiency disorders, cancer or on immunosuppressants may be at a higher risk for developing severe disease.

Keywords: Pediatric dermatology, recommendations, COVID19

Cutaneous Manifestations of COVID-19 in Children

Pediatric coronavirus disease (COVID-19) presents with a wide array of manifestations ranging from asymptomatic infection to mild to moderate symptoms of acute upper respiratory tract infections like fever, fatigue, cough, sore throat, rhinorrhea, congestion, shortness of breath, or, rarely, severe manifestations involving gastrointestinal symptoms, which progresses to respiratory failure, shock, coagulation dysfunction, and renal injury.^[1-4]

The various cutaneous manifestations of COVID-19 infection have been described in adults and only few case reports exist on pediatric COVID-19 infection. The cutaneous manifestations are similar to those caused by other common viral infections with the extent of cutaneous involvement unrelated to the severity of disease. The manifestations can be either exanthems like morbilliform eruptions, urticarial eruptions, vesiculobullous eruptions, and petechial eruptions characteristic of the acute phase of infection or acro-ischemic lesions (COVID toes), chilblain-like lesions,

transient livedo-like lesions in otherwise asymptomatic children and adolescents that are late manifestations of inflammatory processes or micro thrombotic events in the immune phase of disease.^[5]

Recently, there are reports of multisystem inflammatory syndromes reported in children related to COVID-19 infection with overlapping features of toxic shock syndrome, “atypical” (or incomplete) Kawasaki disease, bacterial sepsis, and macrophage activation syndromes and has been referred to as “Pediatric Inflammatory Multisystem Syndrome Temporally associated with SARS-CoV-2 infection (PIMS-TS)” (also referred to “Pediatric Multi-System Inflammatory Syndrome Temporally Associated with COVID-19”), which can occur days to weeks after acute COVID-19 illness. The atypical features include unusual abdominal symptoms with excessive inflammatory markers.^[6] PIMS-TS is diagnosed if a child presents with persistent fever, inflammation (neutrophilia, elevated CRP, and lymphopenia) and evidence of single or multi-organ dysfunction (shock, cardiac, respiratory, renal,

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gastrointestinal, or neurological disorder), with other additional clinical, laboratory or imaging and ECG features. Children fulfilling full or partial criteria for Kawasaki disease are included in the case definition of PIMS-TS. However, the diagnosis is arrived at only after excluding bacterial sepsis, toxic shock syndromes, and enterovirus infections associated with myocarditis. In these cases, SARS-CoV-2 PCR testing may be positive or negative and IgG antibodies maybe positive.^[6]

Challenges Faced in Pediatric Dermatology Practice

The clinical spectrum of manifestations of pediatric COVID-19 is not yet fully defined and there are also constraints to widespread testing owing to limited availability of tests. Hence, the criteria for testing for COVID-19 in pediatric cases is most often restricted to those with respiratory symptoms resulting in missing cases that present with only fever or symptoms pertaining to involvement of other organ systems like the skin or gastrointestinal tract.

Thus, COVID-19 testing should be considered in any febrile child presenting with exanthematous rashes associated with upper respiratory tract infections or gastrointestinal symptoms. It is also indicated for cases presenting with skin rashes associated with multisystem inflammatory syndromes. Since PIMS-TS have been reported to occur weeks after acute COVID-19 illness, these children need to be under follow up and monitoring.^[6]

The impact of COVID-19 infection in immunosuppressed children is a matter of concern owing to the possibility of severe disease in these “high-risk” children as well as regarding the continuation of their ongoing treatment. Though the data on immunosuppressed children is scarce, it has been observed that immunocompromised children were in fact not at greater risk of severe COVID-19; this may be owing to their weaker immune response because a functional host innate immune response is the prerequisite for lung damage.^[7]

Owing to the lack of conclusive evidence describing the benefits or risks of stopping immunomodulators/immunosuppressants during the COVID-19 outbreak, the decision needs to be individualized based on the mechanism of action of drug, frequency, and pharmacokinetics and pharmacodynamics of the drug. Nonbiologic drugs like small molecule inhibitors and immunosuppressants owing to their shorter half-life are relatively easy to stop and can be easily restarted within days to weeks. Biologics, being more targeted and less involved in the components of viral immune response and longer half-life and associated risk of antidrug antibody formation with treatment cessation and subsequent continuation, can be continued if the disease condition warrants it. However, in patients with stable disease, the immunosuppressants can be weaned off and conservative approach be followed.^[8]

The other impacts of lockdown on the physical and mental health of children need to be considered. Reduced physical activity, increased screen time, and consumption of unhealthy food in children from privileged section of society and malnourishment among children from less-privileged sections of society can have their impact on skin health. There might be an increased occurrence of domestic child abuse during this period that needs to be considered while dealing with suspicious cutaneous lesions.^[1]

Recommendations for Pediatric Dermatology Practice

The following recommendations are made for running a Pediatric Dermatology practice in the current COVID-19 pandemic:

General principles for patients and care givers

1. Follow the local and national government guidelines for social distancing and quarantine where warranted. Children should avoid group gatherings and group game activities.
2. General hygienic measures including frequent hand washing by using soap and water for a minimum of 20–30 seconds. Society of Pediatric Dermatology recommends that children should sing their favorite song or rhyme to ensure the required duration of hand washing.^[3]
3. Cleansing of hands with isopropyl alcohol-based hand sanitizers. centre for disease control (CDC) recommends use of 60% ethanol or 70% isopropyl alcohol-based hand rubs over soap and water-based hand washing unless the hands are visibly soiled.^[3] Because most commercially available hand sanitizers come in attractive packaging, children might be tempted to ingest it, and this can lead to alcohol poisoning. The American Academy of Pediatrics recommends that parents follow the same caution with hand sanitizer as with any other poisonous item.^[3] Because there is an evidence of dermal absorption of alcohol from topical use, we do not recommend excessive use of the same by the caregivers of small infants and use of alcohol-based sanitizers in neonates.^[9–11] Fragrances and preservatives contained in hand sanitizers may rarely cause contact dermatitis and should be avoided in children with known hypersensitivities. Children with dry skin conditions should use a fragrance-free moisturizing cream after hand sanitization.
4. Home environment and play surfaces should be cleaned well. Bleach-based cleansers are preferred.

General principles for pediatric dermatology practitioners

1. Due care and precautions need to be followed while examining children with respiratory symptoms.

2. Avoidance or postponement of routine in person visits with appropriate use of telemedicine facilities should be resorted to, which should be in accordance with the guidelines laid down by Ministry of Health and Family Welfare, India.^[12]
3. Explain the natural history of COVID-19 and its preventive measures as well as measures to boost the immune system by regular physical activity and healthy balanced diet. Creating awareness on healthy balanced diet (50% from vegetables and fruits, 25% from rice/chapati for carbohydrates and 25% from pulses/milk/egg/meat for proteins) is very important in pediatric age group to prevent protein energy malnutrition (PEM), which is one of the important factors for morbidity and mortality.
4. Universal immunization to all children should be followed as per the advice of the pediatrician.
5. During out-patient visits, ensure the safety of patient, caregiver, and health care provider by following these measures:
 - a. Avoid walk in patients as much as possible. Limit the number of patients at a time by pre-booking the appointment and providing time slots. Prior telephonic appointment gives opportunity to get information about patient demographics and a brief history while booking itself, which reduces the consultation time.^[13] It should be enquired if the child or the attendant has fever, cough, sore throat, difficulty in breathing with or without skin manifestations or any other symptom suggestive of possible COVID infection, in which case, they should be referred to their pediatrician/fever clinic first.
 - b. Restrict the number of caregivers to 1 parent per child. Minimize the number of staff at the clinic at any given time.
 - c. Implement social distancing in the clinic. Minimum of 1-meter distance must be maintained between each individual.
 - d. Screen patients for symptoms of signs of COVID-19 and for history of contact. All patients and attendants should have their temperature taken before entry in the clinic. If febrile they should be sent to a fever clinic.
 - e. All patients and attendants should have their hands washed with soap for 20 seconds or sanitized using 70% ethyl alcohol-based sanitizer before entering the clinic. They should be advised not to touch any surfaces in and around the clinic.
 - f. Avoid contact with unnecessary surfaces and fomites. Avoid audio or video displays, magazines, toys, newspapers, etc., at waiting areas. The surfaces in consulting room should be sanitized before seeing the next patient. The clinic premises and the frequently contaminated surfaces in other areas like doors, doorknobs, and potential fomites should be cleaned with 0.5% sodium hypochlorite solution or hypochlorite containing disinfectants should be sanitized regularly through the course of the day. The consulting room and waiting room should be sanitized thoroughly at the end of the clinic.
- g. Proper education and training of clinic staff regarding patient screening, hand washing, social distancing, and wearing of appropriate personal protective equipment (PPE) is important to reduce the chances of disease transmission. Both health care staff and patient party should wear face mask at all times. American Academy of Pediatrics and CDC recommend use of mask in children above 2 years of age.^[14] Make sound use of personal protective equipment including N-95 mask and gloves as directed by the ministry of health and family welfare. In case any staff member shows any symptoms suggestive of COVID, strict quarantine and medical care should be provided.
- h. Consultation should ideally be brief and to the point to minimize the contact period. Avoid routine oral cavity examination.
- i. Dermoscopy, a common contact procedure, should be avoided as far as possible. If needed, after use, the dermoscope should be wiped with 70% isopropyl alcohol wipes for at least one minute. A polyvinyl chloride sheet or disposable lens covers can be used to reduce the chances of cross-infection. The child should be asked to turn his head to the opposite side to reduce any chance of spread.^[15]
- j. Phototherapy should be avoided as chamber can become a source of infection despite sanitizing.^[13]
- k. All non-emergency pediatric dermatological procedures (cryosurgery, radiofrequency, electrocautery) should be avoided during this pandemic. For emergency procedures like a skin biopsy, incision and drainage, proper PPE and disinfection should be employed by the operating surgeon and the assistant. Proper air conditioning and use of exhaust fans should be done in the procedure room to maintain an uninterrupted airflow stream.^[16,17]
- l. If possible, electronic prescription should be given, thereby avoiding physical contact.

Disease-specific guidelines

- (i) **Infantile hemangioma:** The Hemangioma Investigator Group gives specific instructions for the management of infantile hemangioma in this scenario. In children with hemangiomas needing treatment, delay of onset of treatment even by few weeks can lead to worsening of treatment outcome as the rate of growth in initial few weeks is high. Tele triage using an infantile hemangioma score can be used to identify those in need for initiation of treatment. Those infants who need treatment can be further classified as standard risk or

as high risk. Oral betablocker and topical medication can be started on a case-to-case basis in patients of standard risk without the stringent monitoring practices usually followed, after explaining the risk benefit ratio to the care givers and obtaining an informed consent. Local registered medical practitioners can be utilized to monitor these children when feasible.^[18]

- (ii) **Atopic dermatitis:** Children with severe forms of atopic dermatitis on systemic therapy should continue the treatment prescribed as stopping treatment can cause sudden flare of disease. If the systemic treatment is paused (in a child infected with COVID-19, if suggested by the treating team), patient should be supplied with ample amount of topical medication with guidance on appropriate usage (Finger tip unit (FTU) to prevent a disease flare. Among the systemic agents used, targeted treatment like dupilumab is considered safer than cyclosporine; however, the data on this is limited.^[19] Nonirritant soap substitutes can be used instead of soap. Moisturizers should be applied after hand wash.^[20]
- (iii) **Childhood psoriasis:** International psoriasis council recommends physicians to discontinue or postpone the use of immunosuppressant therapy in patients with psoriasis who are diagnosed with COVID-19. In other cases of childhood psoriasis, case-to-case basis decision can be made to start or continue immunosuppressants if benefits outweigh the risk.^[21]
- (iv) **Childhood vitiligo:** Children on hospital-based phototherapy should be shifted to home-based phototherapy (PUVASol, handheld NB-UVB devices) to decrease the need for hospital visits and to prevent cross infection within the photo therapy chambers.
- (v) **Immunosuppressive therapy:** As immunosuppression increases the risk of infection *per se*, the use of immunosuppressive agents including biologics should be judicious. However, there is a risk of disease flare if there is a sudden cessation of drugs. As the effect of specific drugs on COVID-19 is not studied yet, we recommend continuation of essential immunosuppressive medications including biologics at the lowest feasible dosage. If there is an option of replacing the drug with a safer alternative or of delaying initiation of immunosuppressants, this option should be taken. However, children and caregivers should be educated to take extra precautions to avoid COVID-19.

Conclusion

The current scenario of the COVID-19 pandemic has resulted in a huge disease burden worldwide affecting people across all age groups. Children are less commonly, as well as less severely affected as compared to adults. They most often present with cutaneous features suggestive of acute viral exanthem or acro-ischemic lesions in

asymptomatic cases or Kawasaki disease-like inflammatory syndrome. Hence, a high index of suspicion for COVID-19 testing should be considered in any febrile child presenting with such manifestations associated with upper respiratory tract infections or gastrointestinal symptoms. The pediatric dermatologist while providing their patients with optimal care should also take utmost precautions to protect themselves as well as the other health care workers and patients by strictly adhering to the recommendations and guidelines.

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Conflicts of interest

There are no conflicts of interest.

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