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COVID - 19

ORIGIN OF PANDEMICS

***Gouri Rao Passi**

Abstract: *The incidence of infectious disease outbreaks is increasing over time. This article presents an overview of some major pandemics. The majority of them are zoonoses and the causes underlying spillovers to humans are analysed. Degradation of wild life habitats, intensive animal husbandry and changing land use are some important causes. The concept of "One Health" is highlighted.*

Keywords: *Pandemics, Wild life, One health.*

Points to Remember

- ***World had constantly faced pandemics, the most prominent being black death caused by bubonic plague in 1340, causing death of one third of European population in a span of five years, which led to the birth of widespread public health measures and the first example of quarantine.***
- ***Bats have played a crucial role in the appearance of many virus epidemics involving, Nipah virus, Ebola, SARS-CoV-1 and now the SARS-CoV-2 (COVID-19).***
- ***Bats not only play a vital role in maintaining nature's balance, but also act as reservoirs for more than 200 viruses.***
- ***Hidden in each outbreak is an urgent lesson for mankind that the natural habitats of wild animals are shrinking. They are being forced to migrate to newer areas often near human settlements.***
- ***Long term solutions include conservation of our forests, wild life and other complex ecosystems. The solution lies in the concept of "One Health". We need to understand that the health of humans is inextricably linked to that of all other animals, organisms, plants and the entire biosphere.***

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COVID - 19

CORONA VIRUS: WHAT DO WE KNOW?

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****Dhanalakshmi K**

Abstract: *Coronavirus causes a wide variety of diseases in various animal species. It is known to cause innocuous respiratory infections and occasional viral diarrhea in humans. Pandemic caused by SARS-CoV-2 (a beta corona virus) is a third spill over in two decades of an animal corona virus to humans. It uses ACE2 receptors for cell entry. Active viral replication has been proved in the cells of human respiratory tract, conjunctiva and gastrointestinal tract contributing to multiple routes of transmission. Peak viral load is noted at the time of presentation which explains the transmission even in pre-symptomatic stage. R_0 is expected to be around 2 to 3, which explains the higher pandemic potential. The virus persists on inanimate objects for a variable period of time depending on the infectious dose, temperature and humidity.*

Keywords: *Coronavirus, Basic reproductive number, Viral load, Replication sites, Infectivity, Stability.*

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Points to Remember

- ***Coronavirus family includes SARS-CoV-1, MERS and SARS-CoV-2, the currently circulating virus.***
- ***There are multiple routes of transmission for SARS-CoV-2 (respiratory, conjunctival, feco-oral routes).***
- ***Peak viral load has been demonstrated at the time of presentation.***
- ***No live virus was demonstrated from the respiratory tract after 8 days and hence infective potential gradually declines after 10 days.***
- ***Basic reproductive number R_0 is around 2 to 3, suggesting the higher pandemic potential of SARS-CoV-2.***
- ***PCR positivity does not always imply active infection, since it cannot distinguish live and dead virus.***
- ***Serology is mainly useful for epidemiological surveillance.***
- ***Herd immunity will play a role in interruption of the pandemic, but currently difficult to ascertain due to lack of information on the seroprotection levels of the population and the non-availability of vaccine.***

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COVID - 19

PATHOPHYSIOLOGY OF COVID-19: KNOWN AND UNKNOWN

Suhas V Prabhu

Abstract: *The corona virus disease 2019 caused by severe acute respiratory syndrome corona virus-2 starts as a respiratory infection but can progress to multi-organ involvement with some very unique and unusual clinical presentations. This can appear at times puzzling and can account for significant morbidity and mortality. Understanding the pathophysiology of this disease can help reveal the various mechanisms of the progress of the disease and can explain the clinical symptoms and offer hope for prevention and treatment modalities.*

Keywords: *SARS-CoV-2, COVID-19, Pathophysiology, Children.*

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Points to Remember

- ***The pathophysiology of SARS-CoV-2 infection appears to be unique with involvement of many systems of the body beyond the respiratory tract.***
- ***The disease progresses through three stages - virus entry and replication, spread to lungs and other organs followed by a hyperimmune response.***
- ***Only a minority of children progress to the hyperimmune response stage.***
- ***Vasculopathy / Coagulopathy is responsible for the complications of thrombosis and embolism in COVID-19.***
- ***Difference in expression level of ACE2 and qualitative response to SARS-CoV-2 can explain the clinical differences observed in children.***
- ***Multisystem inflammatory syndrome due to cytokine storm may present with features of Kawasaki disease.***

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COVID - 19

CLINICAL FEATURES AND DISEASE STRATIFICATION OF COVID-19 IN CHILDREN

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Abstract: *We are in the midst of a pandemic caused by novel virus SARS-Cov-2 with no sign of abating. The clinical features have been ranging from asymptomatic to severe respiratory distress leading to death. Fortunately, children have been less affected in terms of both morbidity and mortality. Although the signs and symptoms are similar to adults, a smaller number of children tend to be symptomatic. Some children however have been reported with unusual skin lesions or vasculitis like syndrome and also recently an overlap of Kawasaki and toxic shock like syndrome named as Pediatric inflammatory multisystem syndrome, temporally associated with SARS-CoV-2. The common presentations in children and their difference from adults are discussed.*

Keywords: *Covid-19, SARS-CoV-2, Clinical features, Children.*

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Points to Remember

- ***Children are less often involved compared to adults.***
- ***The pediatric patients may be asymptomatic or show mild non-specific viral symptoms like fever, cough and cold.***
- ***Some may present with skin lesions or vasculitis.***
- ***High index of suspicion is required in view of non-specific mild illness in pediatric age group.***
- ***Children less than three years should be carefully monitored for deterioration as they may not be able to communicate worsening.***

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COVID - 19

NEUROLOGICAL ASPECTS OF COVID-19 IN CHILDREN

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Abstract: *Children with COVID-19 infection may present with various neurologic manifestations. Although several neurological findings have been documented, it is not clear whether they are causally attributable to SARS-Co-V2 or just occur incidentally in children with COVID-19 infection. During the epidemic period of COVID-19, when seeing patients with neurologic manifestations, clinicians should consider SARS-CoV-2 infection as a differential diagnosis to avoid delayed diagnosis and lose the chance to treat and prevent further transmission. This article documents the various neurological features that have been reported till date due to COVID infection in children.*

Keywords: *Neurological manifestation, COVID -19, Children.*

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Points to Remember

- ***Neurological manifestations are reported in pediatric COVID-19 albeit in lower frequency than that in adults.***
- ***Symptoms range from mild ones like headache to full blown meningoencephalitis.***
- ***Whether the SAR-CoV-2 virus is the etiologic or an incidental accompaniment is yet to be elucidated.***

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COVID - 19

DIAGNOSIS OF COVID-19 IN CHILDREN

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Abstract: *The world is facing an unprecedented crises with the advent and spread of COVID-19. Fortunately children are less affected. Diagnosis begins with identifying the right suspect which in turn depends on local prevalence of infection and contact history. In high burden areas any acute illness with or without fever can be COVID-19. The gold standard for diagnosis is RT-PCR in respiratory specimen. Correct collection and transport of specimen is important. Since the sensitivity of RT-PCR is at best 70%, a negative test does not rule out the diagnosis. Sick children may have lymphopenia and elevated CRP, D-dimer, ferritin, CPK, LDH, IL-6. CT chest is more sensitive than CXR and may be abnormal even in those who are asymptomatic or have mild symptoms. The role of serologic tests in children at this time is limited to diagnosis of pediatric multi system inflammatory syndrome.*

Keywords: *SARS-CoV-2, COVID-19, Children, Diagnosis.*

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Points to Remember

- ***The gold standard test for diagnosis of COVID-19 at this time is RT-PCR in respiratory tract specimens.***
- ***The sample has to be collected and transported properly.***
- ***A negative RT-PCR does not rule out the diagnosis of COVID-19.***
- ***Presence of lymphopenia, high CRP/ ferritin/ D-dimer/ CPK/ LDH may indicate severe disease.***
- ***CT may be useful in the right clinical setting for quick triaging of suspect cases and evaluation of RT-PCR negative cases.***

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COVID - 19

MANAGEMENT OF COVID-19 IN COMMUNITY AND NON-ICU SETTINGS

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Abstract: *Coronavirus disease 2019 (COVID-19) caused by SARS-COV-2 is rarer in children compared to adults. Most countries have reported an incidence of 1- 2% . Whether this reflects 'lower susceptibility' or 'higher proportion of asymptomatic infection in this age group' is not really known. Nevertheless, severe manifestations and deaths are increasingly reported in children. They can act as a source of infection for adults and health care workers, as they cannot follow cough etiquettes as efficiently as adults. Here, we provide a brief overview of pre-ICU management perspectives of COVID-19 disease in children.*

Keywords: *COVID-19, Children, Management.*

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Points to Remember

- ***COVID-19 is rarer in children (1- 2%).***
- ***All suspected of having COVID-19 exposure or infection with mild symptoms should be advised quarantine at home or in isolation centres.***
- ***All children with suspected COVID-19 infection should be categorized into three categories, Category A, B and C.***
- ***Category C is a child with critical symptoms like altered sensorium, shock or respiratory distress or a SpO_2 < 94%.***
- ***Both clinical and laboratory monitoring are essential at periodic interval to decide escalation or deescalation of therapy.***
- ***Non invasive ventilatory support is preferred unless child deteriorates, where intubation and mechanical ventilation is needed.***
- ***Even though there are no proven drugs, those tried in clinical trial settings include hydroxychloroquine / chloroquine, lopinavir / ritonavir, remedesivir, nitazoxanide and ivermectin.***
- ***Safety of the health care workers and others are important at every stage right from triage, admission areas and during transport.***
- ***Hand hygiene, proper donning and doffing of the PPEs and environmental cleaning are extremely important.***

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COVID - 19

CRITICAL CARE MANAGEMENT OF PEDIATRIC COVID-19

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Abstract: *Children tend to have relatively milder COVID-19 illness compared to adults. However, a small proportion of children may need critical care support either due to hypoxic respiratory failure or due to multi-system inflammatory syndrome (Pediatric inflammatory multisystem syndrome, temporally associated with SARS-CoV-2). While the principles of management are consistent with any other severe acute respiratory illness, there are numerous challenges to ensure that the healthcare workers are adequately protected. Significant planning and prior preparation are required to overcome these challenges. Even in the rare circumstances of severe illness in children, good outcomes are possible. The role of specific therapies is unclear and a brief review of medication is presented.*

Keywords: *COVID-19, Pediatric inflammatory multisystem syndrome, Temporally associated with SARS-CoV-2.*

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Points to Remember

- ***Though COVID-19 infection in children is less frequent and need for critical care is a relatively rare occurrence, severe disease and COVID-19 related deaths have been reported.***
- ***Indications for PICU admissions are similar to other emergencies.***
- ***In COVID-19 , step-wise escalation in respiratory support is considered as best practice . Compared to the early days of pandemic, NIV and HFNC use is increasing since it is believed that HFNC does not produce much aerosolisation.***
- ***Supportive management with repurposed or unproven medications is practised widely and more evidence for or against will be available in the next weeks or months from the ongoing studies.***
- ***A new clinical presentation reported recently is the PIMS-TS, a possibly SARS-CoV-2 related, multi-system inflammatory syndrome with overlapping features of Kawasaki disease and toxic shock syndrome.***
- ***While managing PIMS-TS, concerns about re-activation of latent diseases such as tuberculosis must be borne in mind when immunomodulators are considered.***

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COVID - 19

NEONATAL COVID-19

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Abstract: *Novel coronavirus infection is a disease caused by severe acute respiratory syndrome coronavirus 2 and named as coronavirus disease 2019. First confirmed case in adult was reported in December 2019 in China. Since then, research is being conducted in multiple sites in order to better define the epidemiology, clinical characteristics, prevention and treatment of severe acute respiratory syndrome-coronavirus-2 infection in adults. Few cases have been observed in children and newborn infants who seem to have a milder form of clinical disease than other age groups. The purpose of this review is to summarize the available evidence on severe acute respiratory syndrome-coronavirus-2 transmission, the associated clinical presentation, outcomes and treatment in newborn infants with the aim to provide adequate information to neonatologists, pediatricians and obstetricians for managing such patients.*

Keywords: *COVID-19, Perinatal COVID, Neonatal COVID, Corona virus, Vertical transmission.*

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Points to Remember

- ***Current evidence is inconclusive about vertical transmission of SARS-CoV-2 from mothers with COVID-19 to their newborns.***
- ***Majority of newborns tested positive for SARS-CoV-2, are asymptomatic or have mild disease. However, their immature immune system makes them vulnerable to serious respiratory viral infections.***
- ***Airborne, droplet and contact precautions should be followed when attending deliveries and in all aerosol-generating procedures like suction and endotracheal intubation.***
- ***Mothers with COVID-19 can breastfeed their newborn baby, as SARS-CoV-2 has not been detected in breast milk to date.***
- ***Infants born to mothers with COVID-19 should be tested for SARS-CoV-2 at birth or as soon as detection of contact with COVID-19 positive person:– Repeat testing may be needed, if the baby develops symptoms within 14 days of contact or after delivery.***

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COVID - 19

COVID-19 : PREVENTION AND EDUCATION

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Abstract: *The novel coronavirus 2019 pandemic has caused an unprecedented global catastrophe. At present there is no known cure, drug or treatment for this disease. Personal hygiene, social distancing, hygienic practices and care of the infected persons (asymptomatic/ mild symptomatic) are the only preventive measures we have at present. Usefulness of hydroxychloroquine as a preventor drug is yet to be proved. At the time of writing, eight vaccines have reached clinical stage of trials and are being evaluated across the world. In the most optimistic timeline that we can anticipate, it will not be less than a year before any of the vaccines will be available for public use. It is also very important that all routine immunisation practices be continued.*

Keywords: *Novel coronavirus, SARS-CoV-2, Hydroxychloroquine, Coronavirus vaccine.*

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Points to Remember

- ***Individual level prevention of COVID-19 by general public depends on social distancing, frequent hand washing, wearing of cloth masks and periodic decontamination of surfaces.***
- ***Schools, when they start functioning and work places should constantly educate the students and employees respectively, on maintaining adequate distance, avoiding crowding and hand hygiene and make it possible by provision of facilities. They must also encourage to report early if any symptoms develop in them.***
- ***The patient and care giver must strictly follow all the norms laid down for home isolation of pre symptomatic or mildly symptomatic cases.***
- ***The role of hydroxychloroquine in prevention and treatment await robust published results. Till then, the recommendations of ICMR are to be followed for chemoprophylaxis with hydroxychloroquine by high risk contacts only under prescription from an authorised medical authority/doctor.***
- ***There are eight RNA or DNA based inactivated vaccines in phase I/II stages of development.***
- ***Immunization services especially the primary doses of vaccines should be administered to all the eligible children.***

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COVID - 19

THE ROLE OF PEDIATRICIAN DURING THE PANDEMIC

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Abstract : *With the emergence of the corona virus disease 2019 pandemic, many containment measures were imposed including lockdowns. As the lockdown is gradually eased out, there are recommendations put in place by both the government as well as international and national professional bodies for restarting and continuing of child health care delivery in a safe manner. The pediatrician has to put in place new norms in terms of infection prevention and control practices, training and motivation of fellow healthcare workers, immunization practices, telemedicine and selfcare to render continuous quality healthcare and to mitigate risk of infection to all including oneself and to the patients.*

Keywords: *Post lockdown, Preparation, Infection prevention and control, Patient examination, Immunization.*

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Points to Remember

- ***Be prepared, mentally, physically and financially, to handle this pandemic.***
- ***Safety guidelines, personal and personnel protection, can never be taken too lightly, even if the rest of the society are not compliant.***
- ***Give priority to catch up vaccination in the initial days of resuming practice and designate separate times and space for handling healthy children.***
- ***Telemedicine, phone consultation, use of social media to communicate our plans, judicious use of our instruments of practice, planned consultation, and meticulous screening of patients are the new normal.***
- ***Parent and family education goes a long way in the smooth handling of our practice.***

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COVID - 19

USE OF PERSONAL PROTECTIVE EQUIPMENTS DURING COVID-19 PANDEMIC IN RESOURCE LIMITED SETTINGS - THE BAREST MINIMUM NEEDED

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Abstract: *Personal Protective Equipment are protective gear designed to safeguard the health care workers by minimizing exposure to a biological agent. Personal protective equipment includes mask, gloves, face and eye protection (face shield, goggles), gowns and full body suits. Different types of masks are available for specific purposes. Masks are intended for protecting others from respiratory emissions of the wearer while respirator protects wearer from small particles like aerosols besides large droplets. Face shields provide a barrier for suddenly expelled aerosol of body fluids and are commonly used as an alternative to goggles. Isolation gowns may be adequate for medium risk while coveralls provide full protection. It is important to know and appropriately choose the gowns based on the fabric and reliability of manufacturer. All health care workers need to be taught the correct sequence of donning and doffing=PPE in order to avoid contamination. Though not ideal, the most effective methods of sterilizing and reusing N95 masks during scarcity may have to be adopted.*

Essential protective measures depend heavily on the location of patient contact, the role of the particular health care facility and the hazard vulnerability analysis. Hazards for the health care worker can be through air, surface, equipment and body secretions. Personal Protective Equipment reduces the risk of acquiring infection through any of these routes. This article deals with the selection of appropriate personal protective equipment for the health care workers managing suspected or proven COVID-19 infected persons.

Keywords: *Personal protective equipments, N 95, Masks.*

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Points to Remember

- ***Health Care Workers should wear appropriate Personal Protective Eqipment - not only to protect himself from suspected COVID patient but also to prevent patient to patient infection.***
- ***Mask helps in preventing the aerosol spread and N95 respirators are recommended to be used by healthcare workers when caring for COVID-19 positive or suspect.***
- ***Face shields provide a barrier to a bout of suddenly-expelled aerosol of body fluids and are commonly used as an alternative to goggles.***
- ***Isolation gowns including coveralls provide higher level of protection as they cover larger critical zones than traditional surgical gown.***

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MENTAL HEALTH SUPPORT FOR PATIENTS AND PROFESSIONALS

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Abstract : *Covid-19 has created an unprecedented health and economic crisis worldwide. Issues compounding the crises are - ongoing uncertainty about duration of the pandemic, challenges for health care workers in handling patients and personal lives and the enormous economic and social costs for the public at large. All these have led to enormous impact on the mental health of the community, patients and health care professionals. This article aims to highlight the extent of the impact of COVID on mental health and the support required for patients and professionals.*

Keywords: *Covid induced stress, Mental health, Emotional, Stress, Medical resilience, COVID -19.*

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SOCIAL EFFECTS OF COVID-19 PANDEMIC ON CHILDREN IN INDIA

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Abstract: *India as a country is completing more than two months of a nation wide lockdown, of course with different intensity. Impact of COVID-19 on child population is manifold. In addition to the disease related health issues, it has caused damage in various sectors of life - economic, social, cultural and behavioural aspects. Children have equally faced the impact caused by the corona virus and subsequent lock down. COVID-19 has put both lives and livelihood at stake. Though children are affected considerably less than the adults both in number and severity, they are very vulnerable to the non-health related impacts of this pandemic. From delay or missing of routine immunizations to more graver issues like child abuse and food insecurity, children from vulnerable sections of the society face a hoard of problems. This article deals with the social impact of the pandemic in children.*

Keywords: *COVID-19, Social impacts, Children.*

Points to Remember

- ***The social impact of the corona pandemic on children and young people in particular may be significant.***
- ***Defaulting on routine immunization due to lockdown can lead to outbreaks of vaccine preventable diseases.***
- ***Government has introduced several e - platforms for making education accessible to children, but these may not be uniformly available to children with special needs.***
- ***Access to management of chronic and acute medical/ surgical non COVID conditions is also hampered.***
- ***Psychological impact of the pandemic on child and adolescent psyche cannot be undermined.***
- ***Significant increase in child abuse has been reported.***
- ***Street children and children of migrant labourers are exposed to significant challenges in food security and health.***
- ***Telemedicine should be more efficiently utilized during pandemics.***

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COVID - 19

PREPAREDNESS FOR REOPENING AND CONDUCT OF SCHOOLS DURING AND POST COVID-19 PERIOD

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Abstract: *COVID-19 has thrown the educational system of India into turmoil. India with its vast and diverse educational scenario has to prepare itself for reopening and conducting schools, taking into account the disparity in the economic strata among its institutions. Schools serve as nodal centres for distribution of nutritious food, for physical fitness and also take care of psychosocial wellbeing of the children. Hence, closure of schools causes multidimensional effects. Lack of space, resource constraints, disparity in accessing technological advancements are huge challenges in implementing uniform policies while reopening. The introduction of new online and offline platforms of education by the efforts of government has paved the way for a new learning methodology. This combined with additional efforts to take care of the nutritional and physical needs of the children will usher in a different era in Indian educational system. This article discusses policies that can be implemented by schools with the support and willingness of all stake holders from the students to the society at large. The methods and need to implement principles of social distancing, respiratory hygiene and etiquette, minimising large gatherings, restructuring of seating arrangements, self-discipline in reporting and treatment of illnesses are discussed.*

Keywords: *Educational system, India, COVID-19 impact, Reopening schools.*

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Points to Remember

- ***COVID-19 has disrupted India's educational system which is vast and varied with wide disparity in resources amongst the schools in the public and private sector.***
- ***Schools are not only centres of education in India but take care of nutritional and physical needs of children through various schemes.***
- ***Schools need to implement uniform policy to maintain social distancing, respiratory etiquette as well as usher in new modalities of education for the coming years.***
- ***The future of the education system will involve more of e-learning platforms with policies to maintain the privacy of children and newer modalities to take care of nutrition and fitness with significant changes in infrastructure.***

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COVID - 19

GUIDELINES FOR HANDLING DEAD BODY OF A COVID-19 PATIENT

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Abstract: *As the number of positive cases for the novel Coronavirus continues to increase, so do the deaths associated with it. There exists a theoretical risk of infection during handling of the dead bodies and standard infection control practices should be followed when handling such bodies. The government has allowed both the burial and cremation as per the faith. However there is a standard procedure that all health workers and family members need to adhere to. This article highlights some of the guidelines recommended for managing dead bodies of COVID-19 patients.*

Keywords: *Handling dead body, COVID-19, Children.*

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GENERAL ARTICLE

TELEMEDICINE - GUIDANCE FOR PEDIATRIC PRACTICE

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Abstract: *Advancement in technology is a boon in disguise for mankind especially during this COVID-19 pandemic. Telemedicine provides a platform whereby patients are able to receive treatment even without an in-person hospital visit. With proper care, consent and guidelines, telemedicine paves the way for a better tomorrow. At this time, it also serves to prevent spread of infection by minimizing hospital visits which is of due importance in the vulnerable pediatric group. This article is presented as a guidance for the practicing pediatrician embarking on teleconsultation for the first time - issues to be aware of while prescribing and the legal aspects.*

Keywords: *Telemedicine, Pediatrics, Technological infrastructure, Optimum healthcare.*

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CASE REPORT

CHALLENGES ENCOUNTERED IN MANAGING NON COVID-19 ILLNESS DURING A PANDEMIC

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Abstract: *The SARS-CoV-2 pandemic has impacted health care delivery in an unprecedent manner. The uprising COVID-19 trend in India, combined with the information explosion and resource constraints have contributed to uncertainty in managing otherwise straight forward emergencies. Here, we report challenges faced whilst managing a child with a common illness in the COVID-19 period. Modification of current practices and developing universal precautions against COVID-19 is needed to overcome challenges in managing non COVID-19 patients during this pandemic.*

Keywords: *SARS-CoV-2, Foreign body aspiration, Respiratory distress, Bronchoscopy.*

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CASE REPORT

UNUSUAL PRESENTATION OF COVID-19 AS INTUSSUSCEPTION

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Abstract: *COVID-19, caused by novel coronavirus SARS-CoV-2, presents with varied clinical manifestations in pediatric age group. Gastrointestinal (GI) symptoms with/without respiratory manifestations are increasingly reported in children. This infant presented with features of intussusception and fever. Further evaluation showed RT PCR positivity for COVID-19 in the nasopharyngeal swab. Child did not develop any other respiratory manifestations or features of hyperinflammatory syndrome. It is extremely difficult to distinguish if this a manifestation of COVID-19 or an associated illness.*

Keywords: *Intussusception, COVID–19, SARS-CoV-2, Children.*

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