Editorial

COVID-19 - The Pandemic

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Corona virus disease 2019 (COVID-19) is defined as illness caused by a novel corona virus now called severe acute respiratory syndrome corona virus 2 (SARS-CoV-2; formerly called 2019-nCoV), which was first identified amid an outbreak of respiratory illness cases in Wuhan City, Hubei Province, China. It was initially reported to the WHO on December 31, 2019. On January 30, 2020, the WHO declared the COVID-19 outbreak a global health emergency. On March 11, 2020, the WHO declared COVID-19 a global pandemic, its first such designation since declaring H1N1 influenza a pandemic in 2009. We are now amidst of COVID-19 pandemic and it is here to stay until a significant population in the community achieves immunity. The COVID-19 pandemic has taken its toll on the health care systems all over the world. In the present situation we need to focus on 'Risk reduction as much as possible'. The concept of patient care needs to balance with the safety of the healthcare workers and the society. The global shortage of resources has adversely affected the care provided specially in resource limited setups and has exposed inherent weaknesses in our preparedness and response.

Public health has to be pushed higher on a national development agenda. It is well established that investments in health sectors provide substantially better returns, all of which may not be calculable in economic returns. The National Health Policy of India (2017) articulates increasing investment in health to 2.5 per cent of the national gross development product (GDP) by 2025 from a meagre 1.15 per cent in 2017. Even if complied with the National Health Policy, India's allocations shall be far below that of a large number of developing and developed countries. COVID-19 has irrefutably demonstrated the need for greater increase in this share of GDP in health. It also beckons for this much earlier than 2025[1].

The allocated funds should establish comprehensive services in a planned way. Health services are usually considered synonymous with preventive, curative, protective, rehabilitative and restorative services. Without undermining the importance of these components of health systems, pandemics have frequently and forcefully reminded policymakers to allocate more funds for public health, especially in establishing and maintaining adequate capacity for early anticipation, detection, confirmation and mounting effective interventions for any outbreak using a One Health approach.

According to the CDC, individuals at high risk of infection include persons in areas with ongoing local transmission, healthcare workers caring for patients with COVID-19, close contacts of infected persons, and travellers returning from locations where local spread has been reported.

The CDC had postulated that this situation could result in large numbers of patients requiring medical care concurrently, resulting in overloaded public health and healthcare systems and potentially, elevated rates of hospitalisations and deaths. The CDC advised that non-pharmaceutical interventions (NPIs) will serve as the most important response strategy in attempting to delay viral spread and to reduce disease impact[2].

Presentations of COVID-19 have ranged from asymptomatic / mild symptoms to severe illness and mortality. Symptoms may develop 2 days to 2 weeks following exposure to the virus. A pooled analysis of 181 confirmed cases of COVID-19 outside Wuhan, China, found the mean incubation period to be 5.1 days and that 97.5% of individuals who developed symptoms did so within 11.5 days of infection, of

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these 81% are mild (absent or mild pneumonia), 14% are severe (hypoxia, dyspnea, > 50% lung involvement within 24-48 hours), 5% are critical (shock, respiratory failure, multiorgan dysfunction), and 2.3% are fatal.

Microbiologic (PCR) testing is required for definitive diagnosis. Surgical facemasks could prevent the transmission of human corona viruses when worn by symptomatic persons and that this may have implications in controlling the spread of COVID-19.

Data have suggested that asymptomatic patients are able to transmit infection. This raises concerns for the effectiveness of isolation. Approximately 40%-45% of SARS-CoV-2 infections are asymptomatic. The median time from the first positive PCR result to infection resolution (two serial negative results) is 9 days (range, 3-21 days). Delayed resolution correlated with increasing age. 44% (CI, 25%-69%) of secondary cases are infected by a person in the pre-symptomatic stage of infection. Infectiousness begins 2.3 days before symptom onset and peaks 0.7 days before symptom onset. Hence identifying and isolating the disease suspects is the most important step to prevent an outbreak of highly contagious disease like COVID-19 in a health-care facility during an epidemic. The sensitivity of RTPCR for diagnosis remains around 67%. There may be a role of imaging in clinical suspects with Negative RT PCR where they may be subjected to repeated testing.

Some of the COVID-19 positive patients are comfortable and asymptomatic, but have an oxygen saturation < 90%. A medical term **"Happy Hypoxia"** has been coined for it. A state where the body's oxygen concentration gets low (to about 60%), but they continue to be lucid and clear, behave normally till they deteriorate rapidly and collapse. These patients come to hospital with low oxygen levels but are not in distress. In the article published on "Oxygenation Status in Asymptomatic COVID 19 positive subjects" by Dr. Sajal Mitra et al in this issue, Happy Hypoxia was found in around 30% of the asymptomatic or mildly symptomatic patients. These patients require special care and observation in the hospital. Pulse oximetry also aids as a cheap, quick screening tool in the Containment areas to identify these high risk patients and with early detection and treatment we get positive outcomes.

During the acute phase of SARS-CoV infection, lung damage causes edema, alveolar shedding of epithelial cells, and the deposition of hyaline material in the alveolar membranes, reducing the efficiency for gas exchange. Gattitoni et al identified two primary phenotypes of respiratory involvement at presentation. **Type L,** characterised by Low elastance (i.e., high compliance), Low ventilation to perfusion ratio, Low lung weight and Low recruitability; **Type H,** characterized by High elastance, High right-to-left shunt, High lung weight and High recruitability. Hypoxemia reversal with noninvasive options such as high-flow nasal cannula, continuous positive airway pressure, or noninvasive ventilation are primary modes of reversing hypoxia[3]. Infection may trigger the immune system with inflammatory proteins called cytokines that may damage the vital organs, like heart, kidneys, brain in addition to the lungs. Also coagulopathy, vasculitis and rhabdomyolysis has been described with COVID-19 infection. Therapy essentially remain supportive in addition to antiviral drugs, steroids and anticoagulants if D-Dimer is found to be raised[4]. Convalescent plasma may be effective in moderate to severe disease; there being a role of Monoclonal Antibodies in patients with Cytokine Storm. Sometimes, a person fighting off, or recovering from, the Covid-19 virus gets secondarily infected by bacteria or fungus, which has to be tackled efficiently as well.

During the next phase of infection (weeks 2-5), the lungs show signs of fibrosis, noting the deposition of fibrin and infiltration of inflammatory cells and fibroblasts close to the epithelial cells, in the alveolar spaces. During the final stage (weeks 6-8), the lung tissue becomes fibrotic with collagen deposits, and epithelial cell proliferation is observed in alveoli and interstitial spaces.

In conclusion, currently, SARS-CoV-2 has spread rapidly in multiple countries, caused severe illness and sustained human-to-human transmission, making it a concerning and serious public-health threat. Considering the global threat to health caused by SARS-CoV-2, effective prevention and treatment of COVID-19 pneumonia is urgently needed. In view of the epidemiological characteristics of SARS-CoV-2, it is crucial to interrupt the spread of the virus through epidemic prevention and control methods, such as isolating infected patients and controlling the source of infection. In addition to developing new drugs and clinical trials of old drugs, the design and development of safe and effective vaccines for SARS-CoV-2 is needed.

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