EDITORIAL

COVID-19 Pandemic in Pakistan and Its Decline – An Overview

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Pandemics are scourge of humanity for the last many centuries. It is defined as epidemic of infectious disease, which spreads worldwide. Major pandemics have been diseases such as smallpox, tuberculosis, cholera, and plague which was responsible for 75-200 million deaths in 14th century, the plague continued as various epidemics until end of 19th century.

Vaccinations, improvement in sanitation and better nutrition helped us conquer these diseases. Last pandemic known as Spanish Flu caused 50-100 million death in 1918 and infected one third of the world population. Europeans causing vast destruction and deaths carried smallpox and syphilis to American continent. Recently we have pandemics of HIV/AIDS and Covid-19. Severe respiratory RNA virus causes the coronavirus pandemic. So far, more than 35 million people have been affected; more than 1 million people have died and affected 215 counties of the world. The current figures of Pakistan are more than three hundred thousand affected with mortality of more than six thousand five hundred patients. The recent decline in the number of patients in Pakistan and lower number of deaths has surprised many observers. Various theories have been postulated including younger population, strong immune system with ability to recognize new coronavirus infection. Unfortunately there is mild upsurge of the cases and fears of second wave in winter not only in Pakistan but also the world all over.

Corona Virus is a family of viruses, which are large, enveloped, single-stranded RNA viruses found in humans and other mammals and birds; causing illnesses from common cold to Middle East Respiratory syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS CoV-1). The current pandemic is caused by SARS-CoV-2. The present covid-19 infection is characterized by rapid transmission mainly by droplet infection from human to human transmission within six feet. Coughing, sneezing, and talking are main conduit for transmission. The surface contamination followed by touching the face can transmit infection. There are reports of transmission by air within closed condition. Aerosols can also transmit. Human saliva and eyes have been responsible for transmission of disease[1,2]. Maternal COVID-19 is associated with low risk vertical transmission.

The incubation period for majority of patients is 5-7 days but can be of 15 days. The main symptoms are temperature (70-90 %) dry cough (60-80 %) shortness of breath (53-80 %). Other symptoms are losing of taste and smell[1]. A number of patients have cardiac manifestation like ST elevation and myocarditis. The Neurological symptoms may include large strokes.

The diagnosis is made by reverse transcriptase polymerase chain reaction (PCR) by testing of a nasopharyngeal swab or other specimen. Its sensitivity is 33% 4 days after exposure, 62% at onset of symptoms.

The true case fatality is difficult to measure affected by age and comorbidities. It is estimated for age 5-17 is 0.3/1000 death compare to 304/1000 death for age 85 or more. The disease is classified further asymptomatic, mild, moderate, severe, and critical while 15% may develop and 5% critical illness and may need mechanical ventilation[1].

Pathogenesis is mainly due to expression of ACE-2 receptors responsible for respiratory syndrome. Viral replication breaks epithelial-endothelial barrier integrity. Post mortem studies have shown presence of viruses in the tissues and diffuse thickening of alveolar wall with mononuclear cells and macrophages in the airspaces endothelialitis resulting in acute respiratory distress syndrome[3]. Computed tomographic images show ground glass opacities and infiltrates. Intravascular coagulation may occur with complications like Venus thrombosis, pulmonary embolism, and thrombotic arterial complications. A small number of patients can develop cytokine storm characterized by increase in inflammatory markers like C-reactive protein, ferritin, LDH, intralukin-6, and D-Dimer. Coagulopathy has been demonstrated in 33% of the cases during post-mortem examination. Recent MRI scan in post Covid patients have demonstrated myocarditis even in post COVID patients which may herald poor prognosis.

There is initial delay in recognition of symptoms followed by apprehension and fear. Initial disease appeared in Wuhan in China in December 2019 but the WHO declared pandemic on March 11, 2020. The usual response to epidemic is suppression through strategy of social distancing and facial mask resulting in flattening the curve; this will be followed by mitigation when vaccination is available. The epidemics usually have phases of acceleration and deceleration. The pandemic has major economic and social consequences. The health care resources in low and middle-income countries are unable to cope with increased number of patients and lack of facilities for intensive care beds and mechanical ventilators[4].

The management in mainly symptomatic as no cure has been discovered. Most cases are asymptomatic mild to moderate which can be managed at home. Severe and critical will need hospitalization and intensive care. The anti-viral Remdesivir has been found to be affective in shortening the duration of disease and the Tocilizumab for cytokine storm. The Recovery Trial with low dose Dexamethasone has shown effectiveness in decreasing the mortality in patients with hypoxemia and more effective in patients on mechanical ventilations. Convalescent plasma with high titer IgG in a randomized control trial reported from China was associated with improvement in some severely ill patient but not in critically ill. Further trial with convalescent plasma showed some optimism[5].

In asymptomatic SARS-Covid-2 infection, the virus specific antibodies decline despite increase viral shedding. Rapid investment in research in developing suitable vaccine is under progress in several countries. The phase 1 and phase 2 trials of inactivated vaccines show low rate of adverse reaction and effective immunogenicity. A trial of an mRNA (encodes spike S glycoprotein) vaccine induced immune responses with little safety concern[6,7]. Since, 120 candidate vaccines are under development besides safety, main concern is duration of immunity. Phase three trials are in progress including Pakistan. There is variability in responses of patient with antibody production. Some patients with evidence of infection fail to produce antibodies. In another study, 40% asymptomatic patients were seronegative and 12.9% symptomatic groups were in early convalescent phase. It is unclear whether Killer T-Cells or Memory B-Cells will provide protection[8,9]. The vaccine should not only protect but also prevent transmission.

The first case of COVID-19 was diagnosed in Pakistan on 26 February 2020. There was surge of cases in last week of April 2020 as restrictions were relaxed and Standard Operating Procedures were not followed for social distancing during Eid holidays. Since July 2020, number of Positive COVID 19 cases started declining from 20 percent positive cases in June 2020 and less than 5 percent by late August 2020. Case fatality rate has also declined. The reasons for decline are unexplained. The experts have perceived that people in Pakistan have non-specific immunity due to exposure to various vaccines. BCG vaccination and younger population has also been postulated as protective factor along with possibility of pathogen losing virulence. Smart lockdown in contrast to total lockdown is another possible explanation.

World Health Organization has taken an important step in global collaboration with scientist in public and private sector in development of vaccines, diagnostics, and advances in treatment. Early recognition of pandemic is important as there was delay in declaring pandemic by WHO. Government and society should be more open and scientist should not be silenced[10]. The management of pandemic and development of therapeutic is still in fluid stage. Further research studies will define priorities in management.

REFERENCES

1. Wiersinga WJ, Rhodes A, Cheng AC, Peacock SJ, Prescott HC. Pathophysiology, transmission, diagnosis, and treatment of coronavirus disease 2019 (COVID-19): a review. JAMA. 2020;324(8):782-793.
2. Baghizadeh Fini M. Oral saliva and COVID-19. Oral Oncol. 2020;108(104821):256-260.
3. Schaller T, Hirschbühl K, Burkhardt K, Braun G, Trepel M, Märkl B, *et al*. Postmortem examination of patients with COVID-19. JAMA;323(24): 2518-2520.
4. Walker PG, Whittaker C, Watson OJ, Baguelin M, Winskill P, Hamlet A, *et al*. The impact of COVID-19 and strategies for mitigation and suppression in low-and middle-income countries. Science. 2020;369(6502):413-422.
5. Casadevall A, Joyner MJ, Pirofski LA. A Randomized trial of convalescent plasma for COVID-19—potentially hopeful signals. JAMA. 2020;324(5):455-457.
6. Xia S, Duan K, Zhang Y, Zhao D, Zhang H, Xie Z, *et al*. Effect of an inactivated vaccine against SARS-CoV-2 on safety and immunogenicity outcomes: Interim analysis of 2 randomized clinical trials. JAMA (Published online August 13, 2020).
7. Jackson LA, Anderson EJ, Rouphael NG, Roberts PC, Makhene M, Coler RN, *et al*. An mRNA vaccine against SARS-CoV-2—preliminary report. N Engl J Med. 2020:1-12.
8. Long QX, Tang XJ, Shi QL, Li Q, Deng HJ, Yuan J, *et al*. Clinical and immunological assessment of asymptomatic SARS-CoV-2 infections. Nat Med. 2020;26(8):1200-1204.
9. Katz MH. Neutralizing antibodies against SARS-CoV-2—important questions, unclear answers. JAMA Intern Med (Published online August 18, 2020).

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