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COVID-19: A GLOBAL THREAT

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ABSTRACT

Novel coronavirus COVID-19 was declared pandemic by WHO on 11 March 2020 as it had spread to 113 countries till that date. It was the utmost challenge we have faced since World War two. Till May 2019 maximum countries were influenced by this newly emerged disease. Cases of corona is rapidly increasing in many countries including India. At this time the foremost priority of all countries is to testing and treating patients. Due to sudden arrival of this situation no vaccine is available till now therefore we are mainly rely on non-pharmaceutical approaches like social distinction, quarantining citizens, proper sanitisation, covering mouth/nose with mask, cancelling large gatherings such as sport events, concerts and schools, prohibition on international flights, malls, restaurants, transportation etc. It has imparted a major effect on global economy. Unemployment due to job losses in many sectors, disruption in supply chain and abating stock markets are the ultimate consequences of COVID-19. This review summaries about COVID-19, its impact on tourism and response of India against COVID‑19.

KEYWORDS: COVID-19, Pandemic, Disease, Tourism, Sanitisation.

INTRODUCTION

Origin of COVID-19

Group of cases of pneumonia of unknown cause was reported on 31 Dec 2019 in Wuhan, Hubei province, China by Wuhan Municipal Health Commission. Such cases of pneumonia in Wuhan was reported in social media by WHO on 4th January 2020 and disease outbreak news about new virus by WHO was published on 5th January 2020 for the first time. This publication was all about advice and assessment of risk and it reported about the status of patients and response of public health on the basis of whatever China had informed to the organization about group of cases of pneumonia in Wuhan. On 7th January this virus was

identified as a coronavirus that was found to resemble >70% with the SARS-CoV and >95% with bat corona virus. Further on 10 January 2020 technical guidance with advice was issued online by WHO to all countries about method to detect the virus, test procedures and method to manage potential cases. On the bases of experience obtained from SARS, identified modes of transmission of respiratory infection, viruses, prevention control guidance were published for protecting health workers. On 11 January 2020 first fatal case was reported. Genetic sequence of COVID-19 was then shared publicly by China on 12 January 2020. Till that time this type of infection was only noticed in China but on 13 January 2020 a case of COVID-19 was officially confirmed first time outside the China i.e. in Thailand. Lockdown with restrictions of entry and exit from the region was started by 23 January 2019. After that lockdown was extended to other cities of Hubei province. In different countries screening mechanism was initiated in airports including India for detecting symptomatic people returning from China and other countries. Thereafter various cases of infection transmitting from asymptomic people were noticed. Therefore all the travelers from China and other countries (including those who were arrived through special flights by government of India) have been quarantined for the duration of 14 days. Subsequently COVID-19 was spread out globally almost in all countries. There have been around 9,413,289 reported cases of COVID-19 patients and 482,730 deaths reported till date 26-06-2020 as per WHO.[1,2]

Clinical Features

Till now corona virus was detected in blood samples but not confirmed in urine sample and fecal material of patient. Although the virus was isolated from bronchoalvelor lavage fluid in China. Some patients of COVID -19 are found asymptomatic (i.e. without any symptoms), although in some patients multi organ dysfunction and acute respiratory distress syndrome were observed.[1] Common symptoms seen in maximum number of patients includes headache, fever, myalgia, sore throat, cough and breathlessness. In some patients within one week disease can progress to respiratory failure, pneumonia and death. This occurs due to prodigious escalation of inflammatory cytokines including MIP1A, MCP1, MIP1A, GCFS, IL2, IL7, IL10 and TNFα.[3]

Microbiology

There are 4 subtypes of corona virus - gamma, alpha, beta and delta corona virus. Corona virus may have pleomorphic or spherical shape. It contains single stranded enveloped RNA which is covered with a club shaped glycoprotein. Each sub type of corona viruses may have

various serotypes. Some of its types affects human beings while some affects animals like mice, birds and pigs.[1]

Pathophysiology

Exact pathophysiology of COVID-19 is indistinct but its probable pathophysiology is postulated by assuming that its entry in the body will be same as SARS-COV.[4] This virus binds to Angiotensin converting enzyme-2 (ACE-2) receptors in host cell through its structural spike (S) protein and targets the cells like pneumocytes, bronchial epithelial cells and nasal epithelial cells. Viral uptake in the host cell is being promoted by the type 2 transmembrane serine protease (TMPRSS2) responsible for cleaving of ACE2 receptor and activation of SARS-CoV-2 S protein mediating entry of corona virus in host cells.[4,5] Pathogenicity of SARS-CoV-2 is more as compared to SARS-CoV-1 as its affinity to bind with ACE2 receptor is approximately 10 to 20 times greater than SARS-CoV-1 virus.[6] Pathogenesis of COVID-19 can be divided into three stages.[4]

Stage 1 (Asymptomatic state)

It is an asymptomatic stage, includes starting 1 to 2 days of infection. In this stage inhaled virus starts replicating after binding to ACE-2 receptors of epithelial cells present in nasal cavity. Virus can locally pass on but innate immunity response is very low. For detecting virus in stage-1 nasal swabs might be more sensitive than throat swab.[4]

Stage 2 (Conducting and upper airway response)

This stage starts within next few days of infection. In it the virus passes down respiratory tract towards the conducting airways. During this stage innate immune response is triggered vigorously and approximately 80% of patient's disease will be temperate and mainly limited to upper and conducting airways. In Stage 2 the level of innate response cytokines like CXCL 10 and others may be anticipating. Beta and lambda interferons can be widely detected in epithelial cells infected by virus.[4]

Stage 3: (Ground glass infiltrates, Hypoxia and progression to ARDS)

It is observed that only about 20% of patients infected with COVID-19 will progress to this stage and pulmonary infiltrates will develop in them. In this stage virus reaches in lungs and infects alveolar type - II cells. The virus proliferates within these type II cells and releases a large number of viral particles resulting in cell death.[4] In this stage there is rapid increase in replication of virus due to which integrity of endothelial- epithelial barrier gets compromised.

Besides epithelial cells, SARS-CoV-2 virus infects endothelial cells of pulmonary capillary as well, resulting in prompt increase in invasion of neutrophils and monocytes. On computed tomographic imaging a ground glass opacities is observed due to developed edema resulting from interstitial mononuclear inflammatory infiltrates. Disruption of endothelial barrier, impairment of oxygen diffusion capacity and dysfunctioning of alveolar capillary oxygen transmission are the representative features of COVID-19. Multi organ failure may also occur due to irregular response of host to infection. Both adaptive and innate immune response cause impairment of lymphopoiesis and increases apoptosis of lymphocytes.[5]

Prevention

Some guidelines are issued from European Centre for Disease Prevention (ECDC) and World Health Organization (WHO) to reduce the chances of getting infected from corona virus. Although there is no method for complete prevention except taking precautions. Guidelines of WHO includes washing hands thoroughly at regular intervals with alcohol based sanitizer or water and alcohol, maintaining distance of at least 3 feet (1 metre) with others for avoiding virus transfer through sneezing, cough, speaking, breathing etc from the infected person, avoiding crowded place, avoiding touching nose, eyes and mouth as hands touches many surfaces and through hand virus can enter in body through nose, eyes and mouth, follow good respiratory hygiene this includes while sneezing cover your nose and mouth with tissue or with your bent elbow then dispose used tissue immediately, if even minor symptoms are seen stay at home and self-isolate yourself if it is urgent to go wear a mask to avoid infecting others.[7]

As per ECDC guidelines we should try to avoid visiting places and markets where dead or live animals are handled, contact with sick people mainly with whom suffering from cough should be avoided, hands should be washed thoroughly with soap and water or alcohol based disinfectant solution after using toilet, before eating and after any contact with animals.[1]

Mode of spreading

Corona virus can spread from infected person by direct contact or indirect contact. The main reason of spreading this virus is the droplets produced because of coughing or sneezing of COVID-19 infected persons. Direct contact: If any COVID-19 patients mainly who do not have cover their face while sneezing or coughing comes in direct contact with any person there is a risk of spreading infection.

Indirect contact: Corona virus can survive on clothes or surfaces for many days, consequently the disease can be transmitted through touching any infected surfaces or cloth and then touching nose, mouth and eyes.[1,8]

Management and Vaccination

Till now no special vaccine is available for COVID-19. Mechanical ventilation for respiratory support, maintenance of hydration, administration of analgesics and antipyretic are given as supportive therapy. Various antiviral drugs like ritovir/lopinavir, chloroquine phosphate, ribavirin and arbidol have shown therapeutic effects against SARS-CoV-2 when given in initial stage of infection. Arbidol inhibits the fusion of virus with membrane of cell while ritovir/lopinavir which is a protease inhibitor inhibits the endopeptidase C30 of Coronavirus. It has been observed that IFN which produces several antiviral proteins by combining with surface receptors of respiratory epithelial cells helps in preventing further replication and spread of virus when given as aerosol inhalation. The combination of Arbidol, ritovir/lopinavir and IFN aerosol inhalation may have synergistic effects in treating infection. For fighting against SARS-CoV-2 infection plasma therapy was also proved beneficial. It was observed that death rate in severe patients have reduced by plasma therapy. In plasma therapy patients who are fully recovered with SARS-CoV-2 infection are taken as donar as their plasma contains several components of acquired and innate immunity so it can help in fighting against virus of recipient and help in recovery.[9]

Response of various countries for COVID -19

Different countries are adapting different method to combat COVID-19 infection. General procedure followed nationwide includes quarantine or self isolation, different levels of contact tracing, social distancing, avoiding public gathering, adopting public health measures like respiratory etiquette, handwashing and preparation of health systems for sternly ill patients for whom mechanical and oxygen ventilation, isolation, prevention and control with special attention to nursing home facilities is required.[10]

COVID-19 and tourism

Although several major pandemics/ epidemics are experienced by World in the last 40 years but their impact on global economy and tourism was not as much as of COVID-19 pandemic. Due to preventable measures like lockdowns and travel restrictions, global tourism has decelerated down significantly**.** Due to COVID-19 initially almost all national as well as

international traveling was restricted entirely. As the number of COVID-19 cases detonated, travel restrictions were spread out to most countries by the end of March. Most of the hotels were closed or experiencing massively lower tourism numbers. There is a significant decline in 2020 industry revenue forecasts point in 2020, it is predicted that there is a decline of 50.6% STR US hotel revenue for each accessible room. Although later on along with different guidelines regarding specific seating policies, quarantines of passengers after travelling, maintaining distance, requirement of health certificate and others, different airlines were started however the number of travelers has fall down abruptly.[11]

India's Response to COVID-19

On 30th January 2020 the first case of Covid-19 was reported in India, further two more similar cases was reported on 2nd and 3rd February 2020. All three had a travel history of Wuhan, China. One month later i.e. on 2nd March 2020, two new cases of COVID-19 were reported in India (*i.e.* in New Delhi and Hyderabad). Thereafter a sharp increase in numbers of COVID-19 patients was noticed. Ministry of Health and Family Welfare immediately took action and issued a travel advisory regarding travel restrictions for controlling spread of COVID-19. Initially when lockdown was not started all international travelers were asked to self-quarantine for 14 days. Till 15th April 2020 all travel visas to other countries were canceled and in all the states epidemic disease act were invoked, through this act officials were allowed to quarantine suspected cases and close down public places. Different guidelines were developed for surveillance, personal hygiene, contact tracing, quarantine, laboratory tests, management and diagnosis. People were advised to avoid mass gatherings and are not allowed to go outside without wearing mask. Health care facilities were restricted with emergency services while regular in-patient and out-patient services were stopped. Government of India has launched Arogya Setu app through which users of the app gets advisories and best practice for control of COVID-19**.** Some of the colleges, hotels, railway train coaches were converted into quarantine facilities and large public places like stadiums were converted into isolation wards for handling predicted increased number of cases. Existing hospitals were converted for exclusively handling COVID-19 patients in few states.

In India lockdown process was initiated with a 14-hour 'Janta curfew' on March 22nd, announced by Prime Minister Narendra Modi. Followed by Janta curfew, lockdown was started in India. At the headquarter of General Director of Health Service a control room was

set up for addressing virus-related queries. To fight jointly against this pandemic all the countries of SAARC were invited and 10 million US dollars were allocated for SAARC countries.[12] In India lockdown was proceeded in different phases as given below:

Lockdown 1.0: It was initiated in entire country for a period of 21 days from 25 March 2020 to 14 April 2020. During this all the factories and services were deferred; all domestic and international flights was also suspended till further notice. Henceforth, travel in/from India was restricted completely.

Lockdown 2.0: Lockdown was extended up to 3 May 2020.

Lockdown 3.0 – Lockdown was further extended till 17 May 2020 and during this period it was declared that on submitting online application for extension of visa, which got expired or would be expiring during midnight of 01.02.2020 till the date on which international air travel was ban for passengers from India would be extended up to 30 days on 'GRATIS'' bases without overstay penalty.

Lockdown 4.0 – All the changes which are stated above were extended till 31 May 2020 and Visa free travel facility were provided to OCI card holders who are presently not in India, which has been standstill till the date of lifting of prohibition on international air travel of passengers.

Lockdown 5.0: This is actually not an extension of full lockdown. As per the guidelines given by Ministry of home affairs the lockdown is being extended until 30 June 2020 only in containment zones demarcated by states, depending upon the severity of the Covid-19 outbreak in an area.[13]

Unlock 1 was implemented for easing restrictions of lockdown, Union Health Ministry issued some guidelines which is to be followed till 30 June 2020. During Unlock 1 central government has allowed states to decide what will open or close. Most economic activities are set to reopen outside containment zones in many states. Different states have implicated unlock process in different way, for example Delhi chief minister announced that malls, restaurants and places of worship will reopen in unlock 1 but hotels and banquet halls will remain shut. Correspondingly, Jammu & Kashmir administration have announced places of worship will remain shut for the time being. While Government of Uttarakhand decided to

open worship places from 7 am to 7 pm however in containment zones it will remain closed till further instructions. Malls will remain shut until June 30 in Faridabad, Jharkhand, Odisha, Maharashtra, Rajasthan, Tamil Nadu, Meghalaya, Manipur, Daman & Diu, Dadra & Nagar Haveli. Food courts or restaurants are open in certain areas only with some precautions like 50% seating capacity, no gathering of crowd, disinfection of tables after each use and in hotels staff must collect medical history and travel history of people staying there. In entrance of religious places and malls hand sanitizer dispensers and thermal screening provisions is mandatory.

In view of COVID- 19 outbreak Government of India (Finance minister) announced certain relief measures on 24 March 2020 and announces relief package of INR 1.7 trillion on 26 March 2020. Which includes certain tax relief measures for example postponement of direct tax payment deadline, reduction in interest rate for certain tax, postponement of deadlines for filing GST returns and related payments of GST; increment in the wages of MNREGA workers from INR 182 to INR 202; Pradhan Mantri Garib Kalyan Anna Yojana (Food scheme) package was announced to help poor people, widower, physically challenged workers, wage workers; INR 500 per month was transferred in womens Jan Dhan account for 3 months; it was announced that Women who are under below poverty line and are registered under Ujwala scheme will get free LPG cylinders for 3 months; Medical insurance of Rs 5 million worker was announced for healthcare.[13]

Future Directions

COVID‑19 is further going to take many months; public health can be managed by social distancing and improving hygienic practices. This can help in adjourning the onset of community transmission. Contact tracing, testing, precautionary self‑isolation of contacts and isolation of infected persons can help in reducing the number of new cases. High level of understanding in the individuals and acceptance of all these measures is also crucial. Getting back to normal life and everyday activities to the best extent possible with inordinate precaution will be important for future. There is a need to implement antibody testing on large scale for identifying individuals who are already immune to the virus. Presently multiple trials are going on for developing vaccine to treat the respiratory syndrome, but results are still awaited. Furthermore, development and approval will need many more months. In future shift wise and smart working may have to be adopted to diminish COVID‑19 transmission. Online learning mode should be adopted for many more months.

There is a need to develop telemedicine, in addition to its timely identification, efficient diagnosis and clinical management would be the utmost priority.[12]

CONCLUSION

Impact of novel corona virus is worldwide. This pandemic is associated with high fatality rate. Understanding the severity of outcomes associated with corona virus and its high rate of transmission is quite important. This pandemic has developed economic as well as healthcare crisis. To resolve these crisis an exit strategy comprising of widely available effective vaccine and therapeutic drugs is required. It is difficult to estimate that how much time it will take to develop a vaccine for this. Global experience of COVID-19 is instructing that control measures and hostile contract tracing are obligatory for controlling infection until an approved vaccine or treatment is available to the global community. Public health can be managed by social distancing and improving hygienic practices.

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