Novel Corona Pandemic: Virus, Disease and Prevention

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Background

Emerging infectious diseases are considered a major threat to health. The world has witnessed several such infectious diseases within the first two decades of this millennium. SARS and MERS are two of those infections which quickly transformed to epidemic proportions. Now we are witnessing Covid 19, the worst epidemic in a hundred years. The World Health Organization elevated it to a pandemic status in March 2020. At the time of writing this article, the reported patients of COVID-19 across the globe has passed 5 million with over three hundred and fifty thousand deaths. It is predicted that this pandemic will last for over a year accounting to millions of infections and an unprecedented number of deaths. Most countries are still experiencing the initial phase.

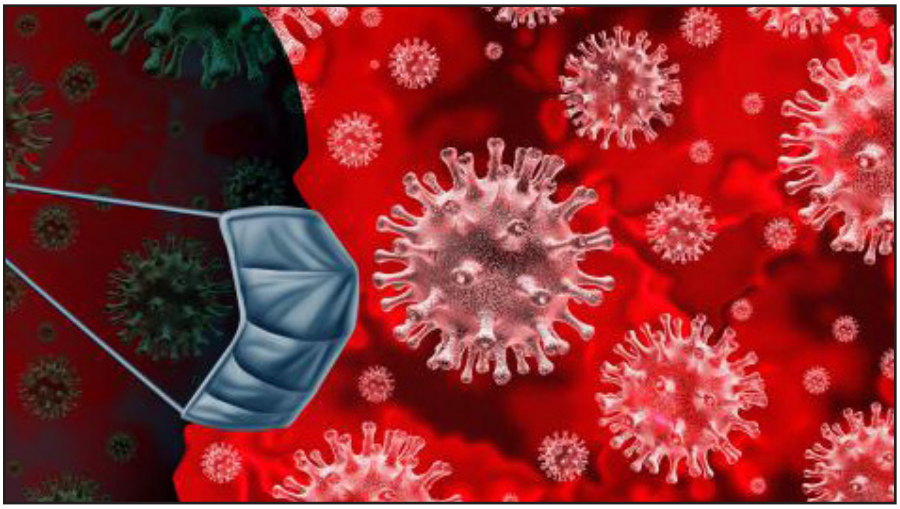
Emerging Infections

According to World Health Organization, Emerging Infectious Diseases (EIDs) are serious public health threats globally. An emerging infection is an infection that has either appeared and affected a population for the first time, or has existed previously, but is rapidly spreading either in terms of the number of people getting infected, or in terms of new geographical areas. Many EIDs are zoonotic in origin, which means that the disease has emerged from an animal and crossed the species barrier to infect human beings. Often human beings may have little or no natural immunity to EIDs, consequently, their impact, on health, society and the economy, are difficult to predict.

When an infection that becomes widespread and affects a whole region, a continent, or the world due to a susceptible population, it is called a pandemic. By definition, a true pandemic causes a high degree of mortality (deaths). The word "pandemic" comes from the Greek word; "pan", which means "all", and "demos" mean "people or population". Therefore, "pandemos" means "all the people". Pandemic in this sense affects all the people.

Novel Corona Virus

Novel corona virus is a RNA virus. It belongs to the family of viruses that include the virus causing common cold, and viruses such as severe acute respiratory syndrome (SARS) and Middle East



Respiratory Syndrome (MERS). Novel corona virus is scientifically named as SARS CoV 2 according to the international nomenclature. This virus was first isolated from patients reported with an unusual respiratory condition from Wuhan Province of China in late December 2019. The condition was marked by several symptoms including fever, dry cough, and tiredness. Less commonly aches and pains, sore throat, diarrhoea, headache and loss of taste or smell has been reported. More serious symptoms are difficulty of breathing or shortness of breath and chest pain.

COVID-19 is thought to spread from person to person, mainly through respiratory droplets produced when an infected person coughs or sneezes. These droplets can land in the mouths or noses of people who are nearby or possibly be inhaled into the lungs. Spread is more likely when people are in close contact with one another. Symptoms may appear 2-14 days after exposure to the virus (incubation period of the infection).

It is observed that most patients show a mild disease. Only around 20 % show moderate to severe symptoms. From the current evidence, only 5% to 6% of patients will need advance life support and admission to intensive care units. New evidence is now emerging that certain patients may not present any symptoms. Although any age group is at risk of getting infected by this virus, it is seen that elderly persons (those over 60 years of age), as well as those already having non communicable diseases, and those who smoke are at a greater risk of developing sever disease symptoms and complications. Death rates among older people are much higher than the relatively younger patients. Based on available evidence, children do not appear to be at higher risk for COVID-19 compared to adults. While some children and infants are reported to be infected, adults make up most of the known cases to date. Also, it has been observed that males have a higher chance of getting infected. However, it is too early to conclude on the disease patterns in different age groups or gender. This is a newly identified virus and much research is needed to understand its true behaviour.

Diagnosing COVID-19

Diagnosis of any disease is based on symptoms of the patient, clinical examination and/or diagnostic tests. Generally, when a person with symptoms is detected, he or she is directed for laboratory diagnosis to confirm the infection.

Routine confirmation of cases of COVID-19 is based on the detection of unique sequences of virus RNA by nucleic acid amplification tests (NAAT) such as real-time reverse-transcription polymerase chain reaction (rRT-PCR). This is the only test recommended by the World Health Organization to detect an infected person.

Reverse transcription polymerase chain reaction (RT-PCR) is a laboratory technique combining reverse transcription of RNA into DNA, and amplification of specific DNA targets using polymerase chain reaction (PCR). It is primarily used to measure the amount of a specific RNA. This is achieved by monitoring the amplification reaction using fluorescence. PCR technique has been used for medical investigations and scientific research for over two decades.

Prevention and Control of COVID-19

Best approach to any diseases is prevention. It is of much relevance to infectious diseases when the infection is an imported one without a local reservoir. As stated, this novel corona virus was first identified from China, which subsequently spread across the globe. Therefore, prompt action from the country of origin and the recipient countries could have reduced the extent of the spread. However, in the present global economic context, where people tend to travel widely across countries and continents, infective agents are transmitted within hours

to far away destinations. Therefore, it was difficult to control the spread across countries and continents.

There are several measures prescribed to prevent spread of infection within the community. These include cancellation and suspension of events with super spreader potential; use of social distancing measures to reduce direct and close contact between people in the community; travel restrictions including reduced flights; suspension of public transport and route restrictions; voluntary home quarantine of contacts; and clear communication on aspects of hygiene from health authorities to ensure verified information to the community.

The Sri Lankan Situation

COVID-19 confirmed cases in Sri Lanka presents a unique picture. All the cases detected up to now can be categorised into four groups: (1) those who returned from overseas, (2) immediate family or close associates of overseas returnees, (3) extended contacts of known cases and (4) service personal infected due to their exposure to patients. Thus, a clear link between newly infected and the known cases can be established among Sri Lankan patients. Therefore, Sri Lankan epidemic can still be considered a cluster epidemic.

Sri Lanka initiated public health response approach even before the first case was detected in late January, by establishing a task force to overseas the mitigation activities. Thus the country was already prepared to face the challenge by the time of detecting the second case in mid-March. Establishing screenings at entry points to the country; guidance on self-quarantine, and mandatory institutional quarantine for travellers from high risk destinations; closure of educational institutions and work from home to enforce physical distancing; closing of sea ports and airports to stop imported cases; and imposing an island-wide curfew to enhance physical distancing, were some of the key measures taken. Basically Sri Lanka instituted a strategy of tracing contacts of known cases, testing them and providing prompt treatment if found positive. These measures were implemented along with an awareness campaign to obtain the support of the general public. The Sri Lankan strategy of facing the COVID-19 challenge is seen as a success compared to many other countries. However, maintaining the epidemic within control, depends on how the public responds and continue to comply with prevention measures.

Future of the Pandemic

Any pandemic has a beginning; a rapid transmission across the globe reaching a peak; and gradually causing a reduction of the number of cases. The natural history of this can be only altered if preventive actions developed and executed by the governments and international collaborations are overlooked. One of the proven preventive methods for infectious diseases is the development of a vaccine. A potent vaccine when injected to a healthy non infected person will generate antibodies inside his body that will protect him from the infection. Many viral and bacterial infections in the past were prevented through immunization. However, development of a vaccine for a new virus takes a considerable time. At present many research groups are trying to develop vaccines against novel corona virus. These studies are still in the preliminary stage. It is estimated that at least another year will be required to produce an effective vaccine. There are also ongoing experiments to discover new medicines to treat the patients. Several drugs are already been used for treatment at experimental level. However, at present none of the drugs have emerged for successful treatment

Hence, the reality is for the public to live with the pandemic for a considerable period of time taking all the precautions as individuals as well as communities to minimize the spread of the infection. We have to learn to Coexist with COVID-19 by adjusting to a new life of keeping physical distance, hand hygiene and wearing a face mask in day to day activities.

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