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Opinion

Pandemic in the 21st Century. The Challenge of COVID-19

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The first cases were reported in Wuhan City, Hubei Province, China in December 2019. The virus was identified as a coronavirus, SARS-CoV-2. The suspicion of the origin of the epidemic fell on a human-animal contact at live game markets. However, viral sequence data indicated that bats were the natural hosts [1].

The clinical picture is fever, dry cough, asthenia, myalgia, dyspnoea, among other symptoms [2]. Some patients progress to Severe Acute Respiratory Syndrome. In these cases, there is an intense inflammatory reaction, with cytokine storm, thrombotic coagulopathy, Acute Respiratory Distress Syndrome. Mortality can reach 40 - 50% in patients admitted to the ICU.

The disease became known as COVID-19. It is highly contagious. Transmission occur by droplets emitted from the oropharynx and nasopharynx. Viability of the virus on surfaces is variable, but on metallic surfaces the viability is more lasting, reaching up to 1 week. The virus is easily eliminated with soap and water, detergents, 70% alcohol.

The growth in the number of cases was exponential. The health system overload was immense. The need for ICU beds was so great that field hospitals were set up in many affected cities. Restrictive measures were taken, such as quarantine at home for cases identified as mild and hospitalization for severe cases. Educational campaigns were developed for the population. Recommended initial measures have become social isolation for the community as a whole and the use of face masks to prevent droplet transmission. The trips were restricted, borders were closed or they started to have strict control of entrances and exits. Public transport such as trains, subways and air travel were restricted in several countries.

However, the epidemic has spread to countless countries due to great mobility and high contagiousness. In a few months, practically all countries, on all continents, were reached. At this time, the World Health Organization considered it a pandemic.

The population's adherence to restrictive measures was variable. In several countries, states and cities, political leaders resisted to implement advises for social isolation. The fear of making restrictive decisions was due to economic consequences, such as recession and mass unemployment. However, in cities with a high incidence of cases temporary lockout has been established.

Although other coronavirus epidemics have occurred in the recent past, such as SARS and MERS, we still do not have vaccines to prevent COVID-19. So far, no specific antiviral treatment was achieved.

Nevertheless, we are moving forward. Three major lines of research have been established for therapy: specific drugs with antiviral activity, preventive treatments such as vaccines, and ICU life support care.

Antivirals such as lopinavir + ritonavir, oseltamivir and remdesivir, among others, are under investigation. Clinical trials are underway using anti-parasitic drugs such as chloroquine, hydroxychloroquine, ivermectin and nitazoxanide. Interleukin 1 and 6 inhibitors, Janus kinase inhibitors, Interferon, SARS-CoV-2 immunoglobulins and COVID-19 convalescent plasma are under investigation.

To date, medications have not proven effective in reducing mortality, but recent articles have reported a reduction in the length of hospital stay with remdesivir IV in critically ill patients [3]. Another study reports that Remdesivir would also reduce mortality in selected cases. Studies suggest good results with anticoagulation to reduce thrombotic phenomena in selected cases [4].

Non-invasive ventilation and pronation in patients not admitted to the ICU seem promising. Different methods of mechanical ventilation are being used according to the different phenotypes. Pronation has been shown to be advantageous in many cases [5]. ECMO (extracorporeal membrane oxygenation) is being used successfully in selected cases.

Protection effectiveness tests are being carried out for different types of personal protective equipment's, diagnostic tests are being developed to be used on large scale. Studies on the impact of social isolation on the spread of the disease and its economic consequences are in progress.

Promising news is that vaccines are being developed and tested at several research centres.

However, to date, the best way to fight the pandemic is preventive measures. Isolation measures, quarantine of patients and close contacts, strict social distancing, use of face masks [6], sanitizing hands and mass testing [7].

We know that epidemics have a course. After the spread, the number of cases stabilizes and then declines. We are using our best to better know and fight COVID-19. With science and resilience, we will be able to mitigate life losses and prevent new cases.

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