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Review Article

Corona Virus: A Review on Covid19

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ABSTRACT

In December 2019, several patients from Wuhan, China were admitted to hospitals with symptoms of pneumonia. As the number of patients presenting with similar symptoms started to rise, the causative agent was eventually isolated from samples. Common symptoms include fever, cough, and shortness of breath. Muscle pain, sputum production, and sore throat are less common symptoms. While the majority of cases result in mild symptoms. The infection is spread from one person to others via respiratory droplets, often produced during coughing and sneezing. It takes 2–14 days to develop symptoms from the day of exposure. It was initially called the 2019 novel coronavirus (2019-nCoV) and has been recently relabelled as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2); the disease it causes has been named coronavirus disease 2019 (COVID-19). Over the next few weeks, the virus spread from Wuhan to affect different provinces in China and, after a few months, it is now present in 109 countries. As of June 10, 2020, there have been 7,356,101 confirmed cases globally, and 414,430 deaths have been registered. The World Health Organization (WHO) called COVID-19 a pandemic on March11, 2020. There are multiple drug trials going on with some positive results. However, since novaccine is available, the best way to combat the virus is by preventive methods. There are significant knowledge gaps in the epidemiology, transmission dynamics, investigation tools and management. In this article, we review the available evidence about this disease. Every decade has witnessed the evolution of a new coronavirus epidemic since the last three decades. The varying transmission patterns, namely, nosocomial transmission and spread through mildly symptomatic cases is an area of concern.

Key Words: Corona virus, WHO, Emergency, Pandemic, Covid 19

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INTRODUCTION

Over the last few decades, the world has seen the existence of new viruses that caused serious threats to global health. In late December 2019, several patients in Wuhan, China started reporting symptoms that resembled pneumonia. A new virus was identified and initially called the 2019 novel coronavirus (2019-nCoV). Coronaviruses (CoVs) are enveloped, positive‑sense, single‑stranded RNA viruses ranging from 60 to140 nm in diameter with spike‑like projections on its surface, giving it a crown‑like appearance under the electron microscope, hence the name CoV. Four CoVs namely HKU1, NL63, 229E, and OC43 have been in circulation in humans, and generally cause mild respiratory disease. [3,4]

The novel corona virus outbreak that we are facing reflects the times we live in. The tremendous development in transport and communication means that a contagion and the panic associated with its spread travels faster than ever, making it difficult to contain both. The world is at risk of devastating epidemics which lead to loss of life, economic losses and social unrest. The current outbreak will be a test of how prepared we are for such a fast moving, virulent respiratory pathogen pandemic.2019-nCoV belongs to subgenus Sarbecovirus of the genus Betacoronavirus of the family coronaviridae. Viruses of the family Coronaviridae possess a single strand, positive-sense RNA genome ranging from 26 to 32 kb in length. Next-generation sequencing and phylogenetic analysis of the genome revealed 2019-nCoV was closely related (88% identical) to two bat-derived SARS-like coronaviruses and more distant from SARS-CoV (79%) and MERS-CoV (50%). Structural analysis suggested that 2019-nCoV might be able to bind to the angiotensin-converting enzyme to receptor in humans similar to SARS CoV which was confirmed by Zhou et al.[1]
Coronavirus is one of the major pathogens that primarily target the human respiratory system. Previous outbreaks of coronaviruses (CoVs) include the severe acute respiratory syndrome (SARS)-CoV and the Middle East respiratory syndrome (MERS)-CoV which have been previously characterized as agents that are a great public health threat.

EPIDERMIOLOGY:

Since 31 December 2019 and as of 13 June 2020, 7 625 883 cases of COVID-19 (in accordance with the applied case definitions and testing strategies in the affected countries) have been reported, including 425931 deaths. Cases have been reported from:

Africa: 225 491 cases; the five countries reporting most cases are South Africa (61 927), Egypt (41 304), Nigeria (15 181), Ghana (11 118) and Algeria (10 698).

Asia: 1 519 477 cases; the five countries reporting most cases are India (308 993), Iran (182 545), Turkey (175 218), Pakistan (132 405) and Saudi Arabia (119 942).

America: 3 718 697 cases; the five countries reporting most cases are United States (2 048 986), Brazil (828 810), Peru (220 749), Chile (160 846) and Mexico (139 196).

Europe: 2 152 756 cases; the five countries reporting most cases are Russia (511 423), United Kingdom (292 950), Spain (243 209), Italy (236 305) and Germany (186 022).

Oceania: 8 766 cases; the five countries reporting most cases are Australia (7 290), New Zealand (1 154), Guam (185), French Polynesia (60) and Northern Mariana Islands (30).

Other: 696 cases have been reported from an international conveyance in Japan.

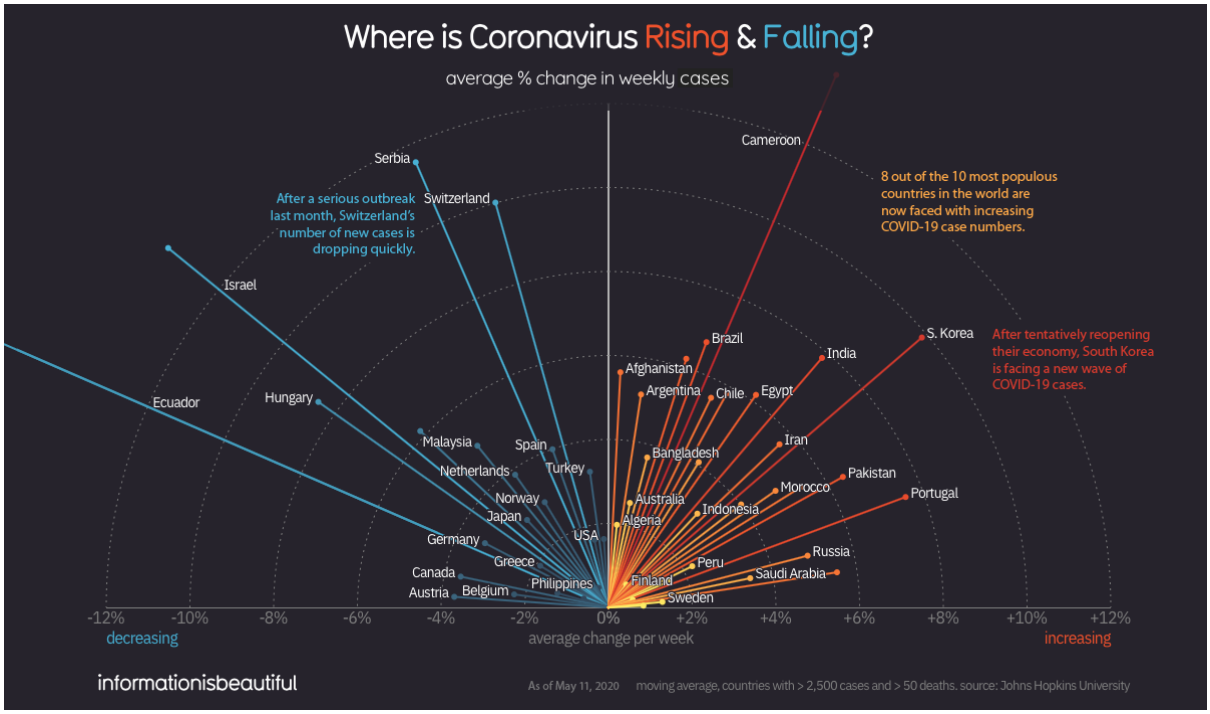
Deaths have been reported from:
Africa: 6 100 deaths; the five countries reporting most deaths are Egypt (1 422), South Africa (1 354), Algeria (751), Sudan (433) and Nigeria (399).Asia: 38 422 deaths; the five countries reporting most deaths are India (8 884), Iran (8 659), Turkey (4 778), China (4 638) and Pakistan (2 551).

America: 199 119 deaths; the five countries reporting most deaths are United States (114 669), Brazil (41 828), Mexico (16 448), Canada (8 049) and Peru (6 308).

Europe: 182 152 deaths; the five countries reporting most deaths are United Kingdom (41 481), Italy (34 223), France (29 374), Spain (27 136) and Belgium (9 646).

Oceania: 131 deaths; the four countries reporting deaths are Australia (102), New Zealand (22), Guam (5) and Northern Mariana Islands (2).

Other: 7 deaths have been reported from an international conveyance in.



Pathophysiology & Clinical Manifestation

Coronavirus is one of the major pathogens that primarily target the human respiratory system. Previous outbreaks of coronaviruses (CoVs) include the severe acute respiratory syndrome (SARS)-CoV and the Middle East respiratory syndrome (MERS)-CoV which have been previously characterized as agents that are a great public health threat. The symptoms of COVID-19 infection appear after an incubation period of approximately 5.2 days. The period from the onset ofCOVID-19 symptoms to death ranged from 6 to 41 days with a median of 14 days. This period is dependent on the age of the patient and status of the patient's immune system. It was shorter among patients > 70-years old compared with those under the age of 70.

The most common symptoms at onset of COVID-19 illness are fever, cough, and fatigue, while other symptoms include sputum production, head-ache, haemoptysis, diarrhoea, dyspnoea, and lymphopenia. It is important to note that there are similarities in the symptoms between COVID-19 and earlier betacoronavirus such as fever, drycough, dyspnea, and bilateral ground-glass opacities on chest CT scans. However, COVID-19 showed some unique clinical features that include the targeting of the lower airway as evident by upper respiratory tract symptoms like rhinorrhoea, sneezing, and sore throat. In addition, based on results from chest radiographs upon admission, some of the cases show an infiltrate in the upper lobe of the lung that is associated with increasing dyspnea with hypoxemia. World Health Organisation (WHO) has classified COVID-19 as aβCoV of group 2B.

Ten genome sequences of COVID-19 obtained from a total of nine patients exhibited 99.98% sequence identity .Another study showed there was 99.8–99.9% nucleotide identity in isolates from five patients and the sequence results revealed the presence of a new beta-CoV strain.

The name "coronavirus," coined in 1968, is derived from the "corona"-like or crown-like morphology observed for these viruses in the electron microscope (318). The Patients infected with COVID-19 showed higher leukocyte numbers, abnormal respiratory findings, and increased levels of plasma pro inflammatory cytokines. Causes fever, sneezing, cough, and difficulty in breathing. One of the COVID-19 case reports showed a patient at 5 days of fever presented with a cough, coarse breathing sounds of both lungs, and a body temperature of 39.0 °C. COVID-19 represents the seventh member of the coronavirus family that infects humans and has been classified under the orthocoronavirus subfamily. The COVID-19 forms a clade within the subgenus sarbecovirus. Based on the genetic sequence identity and the phylogenetic reports, COVID-19 is sufficiently different from SARS-CoV and it can thus be considered as a new betacoronavirus that infects humans. The COVID-19 most likely developed from bat origin coronaviruses. Another piece of evidence that supports the COVID-19 is of bat origin is the existence of a high degree of homology of the ACE2 receptor from a diversity of animal species,

thus implicating these animal species as possible intermediate hosts or animal models for COVID-19 infections. Moreover, these viruses have a single intact open reading frame on gene 8, which is a further indicator of bat-origin CoVs. However, the amino acid sequence of the tentative receptor-binding domain resembles that of SARS-CoV, indicating that these viruses might use the same receptor. There are various types of the corona virus i.e: Human corona virus, Porcine coronavirus, Avian coronavirus, Feline coronavirus, and Bovine coronavirus.[5,7]

Main COVID-19associated symptoms

- Fever
- Cough
- Dyspnoea
- Headache
- Sore throat
- Rhinorrhoea

Chest CT in patients with COVID-19 most commonly demonstrates ground lassopacification with or without consolidative abnormalities, consistent with viral pneumonia. Chest CT abnormalities are more likely tobe bilateral, have a peripheral distribution, and involve the lower lobe. Less common findings include pleural thickening, pleural effusion, and lymphadenopathy. Chest CT may be helpful in making the diagnosis, but no finding can completely rule in or rule out the possibility of COVID-19. The possibility of COVID-19 should be considered primarily in patients with new onset fever and/or respiratory tract symptoms (e.g., cough, dyspnoea) . It should also be considered in patients with severe lower respiratory tract illness without any clear cause. Although these syndromes can occur with other viral respiratory illnesses, the likelihood of COVID-19 is increased if the patient resides in or has travelled within the prior 14 days to a location where there is community transmission of SARS-CoV-2 (i.e., large numbers of cases that cannot be linked to specific transmission chains); has had close contact with a confirmed or suspected case of COVID-19 in the prior 14 days, including through work in health care settings. Close contact includes being within approximately six-feet (about twometers) of a patient for a prolonged period of time while not wearing personal protective equipment or having direct contact with infectious secretions while not wearing personal protective equipment.[2]

TREATMENT

There is no specific treatment for corona virus but the person-to-person transmission of COVID-19 infection led to the isolation of patients that were administered a variety of treatments. At present, there are no specific antiviral drugs or vaccine against COVID-19 infection for potential therapy of humans. The only option available is using broad-spectrum antiviral drugs like Nucleoside analogues and also HIV-protease inhibitors that could attenuate virus infection until the specific antiviral becomes available.

The treatment that has so far been attempted showed that 75 patients were administrated existing antiviral drugs. The course of treatment included twice a day oral ad-ministration of 75 mg oseltamivir, 500 mg lopinavir, 500 mg ritonavirand the intravenous administration of 0·25 g ganciclovir for 3–14 days. Another report showed that the broad-spectrum antiviral remdesivir and chloroquine are highly effective in the control of 2019-nCoV infection in vitro. These antiviral compounds have been used inhuman patients with a safety track record. Thus, these therapeutic agents can be considered to treat COVID-19 infection. The recovery time is about two weeks, while people with severe or critical disease recover within three to six weeks.[6]

CONCLUSION

This review provides an insight intotheCOVID-19currentsituationand represents a picture of the current state of the art in terms of introduction, Epidemiology, pathophysiology and clinical manifestations, and treatment. There is rapidly growing body of literature on this topic and hopefully it will help in finding effective vaccine. This is an early report of a rapidly evolving situation, and the parameters discussed here could change quickly. In the coming weeks, we will continue to monitor the epidemiology of this outbreak using data from news reports and official sources. This new virus pandemic has challenged the economic, medical, and public health infrastructure of the world.

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