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## Infectious Diseases: Covid19

### **Section 1**

#### **What is it about?**

The highly infectious Covid19 virus, which first emerged in December 2019 in Wuhan City, Hubei Province of China, has spread to nearly all parts of the globe. Presently, the World Health Organization website reports that 114,800 fatalities have been caused by Covid19 and the number is expected to surge further in the coming weeks. The number of confirmed Covid cases now stands at 1,279,010 people globally ("Coronavirus Disease (COVID-19) Pandemic").

Markedly, while China was previously the most affected by the virus; the latest reports from the WHO have shown that the United States may be more adversely impacted, at least on a per capita basis. A city such as New York, for instance, has been deeply impacted with the latest official reported deaths standing at 7,000 individuals ("Coronavirus Disease (COVID-19) Pandemic"). The contagious nature of the Covid19 virus has contributed to mass infections and deaths globally.

#### **Evolution of the Disease**

The virus originated in Wuhan and rapidly spread globally. Since the infection was reported, numerous conspiracies have spread. No cure has yet been identified to be effective in combating the virus and no vaccines have yet been announced. One factor that has made the discovery of an antiviral drug difficult is that the virus infects carriers who can then become asymptomatic.

Virologists have widely associated Covid19 with zoo animals since the first cases of the infection were discovered in a wet animal market in Wuhan (Sun 1). Covid19 virus has widely been associated with a class of viral pathogens that target the human respiratory system. The new Covid19 has been widely related to major outbreaks of a similar virus. Albeit, Rothan and Siddappa have stated that the “previous outbreaks of coronaviruses or (CoVs), include the Severe Acute Respiratory Syndrome (SARS)-CoV, and the Middle East Respiratory Syndrome (MERS)-CoV, which have also been previously characterized as agents of critical public health.” Preliminary assessments of the infection have revealed that the 2019-nCoV is an advancement of the two previous acute respiratory infections.

### **Current Concepts and Theories**

The current concepts and theories surrounding (SARS-CoV)-2 are based on the possibility that it underwent an adaptive evolution in its intermediate host, in this case, zoo animals, before its transfer to humans. Nonetheless, the transfer to humans occurred from a more concentrated source of transmission. Studies into Covid19 have revealed that there is a high affinity for human-animal contraction due to the compatibility of protein receptors (Zheng et al. 2). The WHO has classified the new CoV as the latest of the seven members of *Coronaviridae*, which has a high affinity to infecting humans. Inherently, CoVs are a different class of divergent viruses that are found in a wide range of host species that include but are not limited to birds and mammals. CoV was first discovered between 2002 and 2003 with characteristics of respiratory infections, specifically, pneumonia-related complications (Sun n.p). The infection was first reported in Guangdong Province, and due to human traffic and movements, the disease spread to areas such as Hong Kong.

**Normal Duration the Disease takes; factors that precipitate, aggravate, and relieve it.**

According to WHO information regarding Covid19, the incubation period is estimated to range between 1-14 days but is most commonly around five days ("Coronavirus Disease (COVID-19) Pandemic"). Markedly, due to the unique nature of the infection, Germany recently embarked on conducting tests on asymptomatic patients to determine the nature of the disease's incubation in humans. In the test for asymptomatic infection documented in Germany, patients' throat samples were tested positive by reverse transcription (RT)-PCR and by virus isolation (Dowd n.p). What was evident from the tests, however, was that the asymptomatic patients remained healthy and afebrile for seven days. Medical professionals have identified underlying medical conditions as the leading factors that aggravate Covid19 infection. Zheng et al. (2) note that "although the clinical manifestations of Covid19 are dominated by respiratory symptoms, patients with a history of cardiovascular diseases (CVDs) increases the risk of mortality."

Due to Covid19's damage to the cardiovascular system, the medical team needs to assess such risks for timely interventions that will oversee the effective management of the condition. In the same vein, hypertension and diabetes mellitus have been identified by the authors as major aggravates of the infection. Conclusive studies have not been identified regarding the primary relievers for Covid19. However, the WHO has suggested that people who suspect or have been confirmed to be having the infection can self-isolate to avoid infecting healthy populations. People who do not have underlying medical conditions should not be overly anxious since they have higher chances of recovery.

## **Section 2**

### **Current Diagnostic procedures being used to evaluate the condition.**

The large numbers posted in the Covid19 infection have significantly impacted testing resources in most health facilities globally. Due to the shortages of laboratory-based molecular testing

capacity and reagents, diagnostic test manufacturers have resorted to developing rapid and easy-to-use testing kits that would facilitate testing outside laboratories (Sun n.p). Inherently, two types of test kits have been manufactured to aid in testing the virus. The first simple test kit is based on the detection of proteins from the Covid19 virus from samples taken from throat swabs and sputum. The second sample test kit that has been widely used amidst the pandemic detects antibodies in blood or serum taken from the suspected patients.

Besides the presence of these testing tools, the WHO has offered specific guidelines on the testing procedures. For instance, the organization has specified that the utilization of the new immunodiagnostic tests should only be used in research settings and not for clinical decision-making purposes ("Coronavirus Disease (COVID-19) Pandemic"). The approach of conducting Covid19 tests using the antibodies count has been discouraged since the strength of the antibody response is dependent on a variety of aspects. For instance, age, nutritional factors, underlying medical conditions, or infections such as HIV, suppresses an individual's immune system (Rothan and Byrareddy n.p). The other diagnostic procedure that has been employed in the diagnosis of Covid19 is the utilization of X-rays and CT scans. CT scans have been essential in the examination of patients' respiratory organs since the images obtained have a higher resolution of the soft body tissues.

### **Section 3**

#### **Current Medical management**

The widespread transmission and the number of deaths caused by Covid19 have called for immediate medical intervention to contain the viral infection. Notably, there is no known antiviral drug or vaccine to treat humans. Rothan and Byrareddy affirm that the only viable option at the moment is using broad-spectrum antiviral drugs such as Nucleoside analogs and

HIV-protease inhibitors. The researchers have noted that the two treatment options are meant to attenuate the viral infection until a remedy is discovered. A treatment attempt overview across the globe has shown that nearly 75% of the patients have been administered the Nucleoside analogs as well as HIV protease inhibitors. According to the article by Rothan and Byrareddy, “the treatment plan entails the administration of twice a day, 75 mg oseltamivir, 500mg lopinavir, 500mg ritonavir, and the prescription of intravenous 0.25 ganciclovir for approximately 3-14 days depending on the patient’s response to the medications”

Similarly, some intervention in the containment of the Covid19 virus is the use of broad-spectrum antiviral remdesivir and chloroquine, which have both depicted high effectiveness in the control of the virus (Rothan and Byrareddy n.p). Albeit, these therapeutic interventions have been used previously on humans with a safety track record. EIDD-2801 compound has also been widely used in attempts to treat Covid19 due to its highly proven response to seasonal and pandemic influenza virus infections. Using these broad-spectrum interventions for Covid19 is the most reasonable approach at the moment since there is no proven antiviral drug that has been found to treat the viral infection.

### **Is the patient going to be cured or will it become chronic, will the patient die?**

A significant portion of patients who have been infected with the Covid19 virus have recovered fully. However, as stipulated earlier, some have not recovered, and they have succumbed to the virus. A majority of individuals who have succumbed to Covid19 have been identified to have had underlying medical conditions (Dowd n.p). As stated earlier, patients with a history of cardiovascular diseases (CVDs) have an increased risk of dying. In the same vein, people who have a history of respiratory infections have been identified as a group that is more vulnerable to death from the virus. Prevention measures such as constant sanitization and the overall

maintenance of proper hygiene are some solutions that have been offered by experts. The chances of a patient surviving depend on the availability of emergency care facilities in the event that those infected display difficulty in breathing.

## Work Cited

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