WARIBO A. DESIRE

16/SCI05/009

VIROLOGY AND TISSUE CULTURE

VIROLOGY, EPIDEMIOLOGY, PATHOGENESIS AND CONTROL OF COVID-19

VIROLOGY:

The aetiologic agent of the Corona Virus disease, 2019 is Corona virus, which by the World Health Organisation now has a current reference name: severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (Adhikari, 2020). The Coronavirus belongs to a family of viruses that may cause various symptoms such as pneumonia, fever, breathing difficulty, and lung infection. These viruses are common in animals worldwide, but very few cases have been known to affect humans. Coronaviridae is a family of enveloped, positive-sense, single-stranded RNA viruses. The viral genome is 26–32 kilobases in length. The particles are typically decorated with large (~20 nm), club- or petal-shaped surface projections (the "peplomers" or "spikes"), which in electron micrographs of spherical particles create an image reminiscent of the solar corona (Coronaviridae, n.d.).

PATHOGENICITY:

The most likely ecological reservoirs for SARS-CoV-2 are bats, but it is believed that the virus jumped the species barrier to humans from another intermediate animal host. This intermediate animal host could be a domestic food animal, a wild animal, or a domesticated wild animal which has not yet been identified (World Health Organisation, n.d.). SARS-CoV-2 is a respiratory virus, and as such, it is mainly transmitted between people through "respiratory droplets" when symptomatic people sneeze or cough (Tia, 2020). Transmission may also occur through foamites in the immediate environment around the infected person. Therefore, transmission of the COVID-19 virus can occur by direct contact with infected people and indirect contact with surfaces in the immediate environment or with objects used on the infected person (e.g., stethoscope or thermometer) (World Health Organisation, 2020).

In the context of COVID-19, airborne transmission may be possible in specific circumstances and settings in which procedures or support treatments that generate aerosols are performed; i.e., endotracheal intubation, bronchoscopy, open suctioning, administration of nebulised treatment, manual ventilation before intubation, turning the patient to the prone position, disconnecting the patient from the ventilator, non-invasive positive-pressure ventilation, tracheostomy, and cardiopulmonary resuscitation.

There is some evidence that COVID-19 infection may lead to intestinal infection and be present in faeces. However, to date only one study has cultured the COVID-19 virus from a single stool specimen. There have been no reports of faecal−oral transmission of the COVID-19 virus to date (World Health Organisation, 2020). The incubation period (time from exposure to the development of symptoms) of the virus is estimated to be between 2 and 14 days. However, a case with an incubation period of 27 days has been reported by Hubei Province local government (Coronavirus Incubation Period, 2020).

Reported illnesses have ranged from people with little to no symptoms, to people being severely ill.

Symptoms may include fever, coughing, shortness of breath. These may progress to severe respiratory illness and/or multiple organ failure. People with underlying medical conditions may experience worse symptoms and even death (The novel Corona Virus Disease, n.d.).

EPIDEMIOLOGY

COVID-19 is a pandemic that was first discovered in Wuhan, China in 2019 has expanded from Wuhan throughout China and is being exported to a growing number of countries including Nigeria (Lipsitch *et al*., 2020). Currently the virus has spread to more than 180 countries according to Vasanthi in Pharmaceutical technology. Confirmed novel coronavirus cases increased ten-fold in less than a month, from 100,000 in the first week of March to more than one million on 02 April, 2020 while more than 52,000 deaths have been reported across the world. This is a demonstration of its rapid infection rate. Europe has become the new epicentre of coronavirus. More than 90% of the global COVID-19 cases are currently outside China (Vasanthi, 2020).

The first case in Nigeria was reported on the 27th of February, 2020 from the return of an Italian man who works in Nigeria (Nigerian Center for Disease Control, 2020). This case was confirmed in Lagos and the number of cases has been a constant increase since then, spreading across states so that 12 states are now affected by the virus, the once with the highest number being in Lagos, Osun and Abuja, respectively (Africanews, 2020). In Nigeria, a total of about 300 cases have been reported and increase in number has been predicted through contact tracing. We’ve had 6 deaths including the index case, but a good number of recovered cases has also been reported.

TREATMENT AND VACCINES

There is no specific treatment for disease caused by a novel coronavirus. However, many of the symptoms can be treated and therefore treatment based on the patient’s clinical condition. Moreover, supportive care for infected persons can be highly effective (World Health Organisation, 2020). A number of broadcast has explained that scientists over the world are working on the creation of vaccines that would curtail the spread of COVID-19, but there have been no confirmed and approved vaccine to be used against the pandemic.

PREVENTION AND CONTROL

* Wash your hands regularly with soap and water, or clean them with alcohol-based hand sanitizers, although washing is a more effective prevention. The sanitizer is advised to have 60% or more alcohol content.
* At national or state level, social distancing should be practised.
* Maintain at least 1 metre distance between you and people coughing or sneezing.
* Avoid touching your face.
* Cover your mouth and nose when coughing or sneezing with a tissue which should be properly after use, or use the crook of the elbow.
* Stay home if you feel unwell.
* Refrain from smoking and other activities that weaken the lungs.
* Practice physical distancing by avoiding unnecessary travel and staying away from large groups of people.

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