

A Review Article on Corona Virus 2019-nCoV (COVID-19)

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Abstract

Coronaviruses are a group of viruses that cause diseases in mammals and birds. In humans, the viruses cause respiratory infections which are typically mild, including the common cold; however, rarer forms such as SARS, MERS and the novel coronavirus causing the current outbreak can be lethal. Coronaviruses were discovered in the 1960s. On 31 December 2019, the outbreak was traced to a novel strain of coronavirus, which was labelled as 2019-nCoV by the World Health Organization (WHO). Human to human transmission of coronaviruses is primarily thought to occur among close contacts via respiratory droplets generated by sneezing and coughing. Clinical laboratories performing routine haematology, urinalysis, and clinical chemistry studies, and microbiology laboratories performing diagnostic tests on serum, blood, or urine. There is currently no vaccine to prevent 2019-nCoV infection. The best way to prevent infection is to avoid being exposed to this virus.

Keywords: SARS, MERS, 2019-nCoV, Orthocoronavirinae, Coronaviridae & Nidovirales.

Introduction

The name “coronavirus” is derived from the Latin corona, meaning crown or halo, which refers to the characteristic appearance of the virus particles (virions)¹. Coronaviruses are a group of viruses that cause diseases in mammals and birds. In humans, the viruses cause respiratory infections which are typically mild, including the common cold; however, rarer forms such as SARS, MERS and the novel coronavirus causing the current outbreak can be lethal. In cows and pigs they may cause diarrhoea, while in chickens they can cause an upper respiratory disease. Coronaviruses are viruses in the subfamily Orthocoronavirinae in the family Coronaviridae, in the order Nidovirales these are enveloped viruses with a positive-sense single-stranded RNA genome and with a nucleocapsid of helical symmetry. The genomic size of coronaviruses ranges from approximately 26 to 32 kilobases, the largest for an

virus. They have a fringe reminiscent of a royal crown or of the solar corona.²

Incidence: Coronaviruses were discovered in the 1960s.³ In September 2012, a new type of coronavirus was identified, initially called Novel Coronavirus 2012, and now officially named Middle East Respiratory syndrome coronavirus (MERS-CoV).^{4&5} Four members of a Chinese family have been diagnosed with coronavirus in the United Arab Emirates.

The earliest ones discovered were infectious bronchitis virus in chickens and two viruses from the nasal cavities of human patients with the common cold that were subsequently named human coronavirus 229E and human coronavirus OC43⁶. In December 2019, a pneumonia outbreak was reported in Wuhan, China. On 31 December 2019, the outbreak was traced to a novel strain of coronavirus, which was labelled as 2019-nCoV by the World Health Organization (WHO).

As of 1st April 2020 (05:09 GMT), there have been 42,334 confirmed deaths and more than 8,59,338 confirmed cases in the coronavirus pneumonia outbreak.¹⁰

Signs & symptoms: Coronaviruses are believed to cause a significant percentage of all common colds

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in human adults and children. Coronaviruses cause colds with major symptoms, e.g. fever, throat swollen adenoids, in humans primarily in the winter and early spring seasons.¹¹ Coronaviruses can cause pneumonia, either direct viral pneumonia or a secondary bacterial pneumonia and they can also cause bronchitis, either direct viral bronchitis or a secondary bacterial bronchitis. The much publicized human coronavirus discovered in 2003, SARS-CoV which causes Severe Acute Respiratory Syndrome (SARS), has a unique pathogenesis because it causes both upper and lower respiratory tract infections.¹²

Mode of transmission: The WHO and the US Centers for Disease Control and Prevention (CDC) say it is primarily spread during close contact and by small droplets produced when people cough, sneeze or talk with close contact being within 1–3 m (3 ft 3 in–9 ft 10 in).¹⁴

Respiratory droplets may also be produced while breathing out, including when talking. Though the virus is not generally airborne.

Laboratory diagnosis: The test is typically done on respiratory samples obtained by a nasopharyngeal swab; however, a nasal swab or sputum sample may also be used.¹⁵

Microscopy: Light and electron microscopy can rapidly provide the first information on the potential causative agent in clinical materials. However subsequent testing is needed to identify the pathogen.

Culture: Viral culture is often considered the “gold standard” for laboratory diagnosis of viral respiratory infections. Laboratories with the appropriate experience and containment facilities, may attempt to isolate the virus. These recommendations do not cover virus isolation procedures. Culture of virus has important biosafety implications, depending on the type of virus, its pathogenicity and mechanism of spread.

Molecular identification and characterization of a novel pathogen: A number of methods and systems for rapid and sensitive identification of the genetic sequence of novel pathogens have been developed and refined. Sharing such gene sequence information among collaborators is essential to rapidly identify the pathogen and to develop pathogen specific diagnostics.

Prevention: Preventive measures to reduce the

chances of infection include staying at home, avoiding crowded places, washing hands with soap and water often and for at least 20 seconds, practising good respiratory hygiene and avoiding touching the eyes, nose or mouth with unwashed hands. Wash hands often with soap and water for at least 20 seconds. Use an alcohol-based hand sanitizer that contains at least 60% alcohol if soap and water are not available.

The CDC recommends covering the mouth and nose with a tissue when coughing or sneezing and recommends using the inside of the elbow if no tissue is available. They also recommend proper hand hygiene after any cough or sneeze.

The CDC also recommends that individuals wash hands often with soap and water for at least 20 seconds, especially after going to the toilet or when hands are visibly dirty, before eating and after blowing one’s nose, coughing or sneezing. It further recommends using an alcohol-based hand sanitiser with at least 60% alcohol, but only when soap and water are not readily available.¹⁶

Ethical Clearance: This article is a purely a narrative review article hence it’s not required an ethical clearance.

Source of Funding: Self (review article)

Conflict of Interest: Nil

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