

A Review of Coronavirus Transmission

Dr. Maheswari K, Professor & HOD¹,

Dr. Anand V, Professor & HOD²

^{1,2}Meenakshi Academy of Higher Education and Research

maheswari@mmchri.ac.in

Abstract

Earlier in December 2019, a novel extreme coronaviral syndrome 2 (SARS-CoV-2) outbreak of coronavirus 2019 (COVID-19) occurred in Wuhan, Hubei Region, China. The World Health Organisation announced the epidemic as an international disaster in public health on 30 January 2020. As of 14 February 2020, there were 49,053 laboratory-confirmed fatalities and 1,381 deaths worldwide. Many governments have become at risk of contracting illness after implementing a series of prevention steps. We performed a literature review of resources accessible to the public to synthesise pathogen and emerging disease awareness. This literature review analyses the causative cause, pathogenesis and immune reactions, epidemiology, detection, care and managing methods for the epidemic, regulating and preventing.

Keywords: Covid 19, Transmission, Epidemic, Pandemic

Background

On 31 December 2019, a number of cases of unexplained etiologic pneumonia in Wuhan Area, Hubei Province, Central China, were alerted to the World Health Organisation (WHO). Cases have been recorded since December 8, 2019 and several patients have been employed in or residing around Huanan Seafood Wholesale, but there is no cause in other early cases. The latest coronavirus, initially abbreviated as WHO's 2019-nCoV, was identified on January 7 from the patient's throat swab sample.¹ This pathogen was later called Coronavirus Research Group as Extreme Acute Air Syndrome Coronavirus 2 (SARS-CoV-2) and was named Coronavirus 2019 (COVID-19) by the WHO. As of January 30, there were 7736 verified cases and 12 167 suspicious cases in China, with 82 confirmed cases identified in 18 other countries.² The same day WHO reported the SARS-CoV-2 epidemic as an international public health emergency (PHEIC). According to the Chinese National Health Commission, the incidence of morbidity in reported cases in China was 2.1% on 4 February, with the mortality rate being 0.2% for non-Chinese cases.² The mortality rate for patients admitted to hospitals ranged from 11 percent to 15 percent. COVID-20 is moderately contagious, but the evidence available in public records and written literature is rising steadily. The aim of this analysis is to summarize COVID-19's

existing knowledge of causative agents, disease pathogens, case detection and care, as well as control and preventative strategies.

Discussion

Classification and root of the virus

SARS-CoV-2 is a member of the Coronaviridae family and Nidovirales order. The family consists of two sub-families, Coronavirinae and Torovirinae and members of the Coronavirinae subfamily. They are classified into four genera: (a) alpha coronavirus (HCoV)-229E and HCoV-NL63; (b) beta coronavirus comprises HCoV-OC43, SARS-HCoV and HCoV-HKU1 as well as Middle-Eastern Respiratory Syndrome Coronavirus (ME).³ Coronavirus: SARS-CoV-2 and the two extremely pathogenic Viruses, SARS-CoV and MERS-CoV, belong to a Betacoronavirus. SARS-CoV-2 is an enveloped positive sensor mono-stranded RNA (+ssRNA) virus. SARS-CoV-2 is a novel betacoro-navirus infecting humans.⁴ SARS-CoV-2 genome phylogenetic review revealed a near link between the virus (with an identification of 88 percent) and two bat-derived SARS-like coronaviruses acquired in eastern China by 2018 (bat-SL-CoVZC45 and bat-SL-CoVZXC21) as well as a genetically separate connection between SARS-Cov (similar to approximately 79 percent) and MERS-CoV21.⁵ A further analysis reported that BatCoV RaTG13, a bat coronavirus previously identified in the *Rhinolophus affinis* of Yunnan Province that had a total genome sequence identification of 96.2 percent, is more linked to the virus.⁶ The analysis has shown that there is no proof of the recombination events in the SARS-CoV-2 genome from other viruses obtained from bats such as BatCoV RaTG13, SARS-CoV and SARSr-CoV. All in all, these results indicate that bats could be the initial virus host.¹

A research is nevertheless required to decide whether intermediate hosts have enabled the spread of the virus to humans.⁷ Bats are unlikely to be a species that responds specifically to human transmission of the virus for many reasons: Multiple non-aquatical animal (including mammals) have been marketed or not identified for procurement in the wholesale sector of Huanan Seafoods; SARS-CoV-2 with its close relatives, Bat-SL-CoVZC45 and Bat-SL-CoVZXC21, has comparatively long branches, suggesting that these viruses are not immediate descendants of SARS-CoV-2; and with other Wholesale Coronaviruses (civets and possibly camels, respectively).⁸ However, bats do not often require an intermediate host to spread viruses to people. Nipah virus in Bangladesh, for instance, is spread to raw palm sap by bats.⁹

Transmission

The position of the wholesale sector for Huanan Seafood in propagating diseases is unknown. Many initial cases of COVID-19 have been identified with this industry, which indicate that SARS-CoV-2 is transmitted from animals to humans.¹⁰ However, there is provided proof of the virus being imported to the market more easily from another, still undisclosed place, while human-to-human transmission may have happened earlier.¹¹ The occurrence of person-to-person infection has been reported in clusters of compromised family members and health workers. Less than 10 percent of patients were subjected to the sector after January 1 and more than 70 percent were non-market exposures. The transmitting of individuals through near encounters is believed to occur primarily through the respiratory gout created when an infected person coughs or sneezes. Fomites may be regarded as a significant source of transmission, because SARS-CoV survives for up to 96 h [16] and other coronaviruses for up to 9 days.¹²

It is controversial whether or not asymptomatic disease transmission occurs. The first clinical paper on asymptomatic transmission was released on 30 January, but later it was discovered that researchers had not specifically interviewed the patient who had previously had symptoms until the illness was transmitted.¹³ A more recent research on asymptomatic transmission, published on 21 February, also documented, but mistakes in self-reported symptoms or interaction with other cases and fomites can restrict such studies.¹⁴

Findings of disease properties shift quickly and are prone to selection distortions. An analysis found that the mean incubation duration was 5.2 days (95% trust interval [95% CI]: 4.1%–7.0). It was observed that the incubation cycle lasted for 19 to 24 days, but usually case meanings depend on a 14-day window.¹⁵ The simple reproductive numbers (R_0) have been calculated with various outcomes and interpretations. R_0 tests the total number of infections from one sick person in a totally susceptible community. In previous epidemic studies, R_0 was reported as 2.7 for SARS and 2.4 for 2009 pandemic influenza H1N1. The fundamental reproductive number (R_0) was calculated in one analysis to be 2.2 (95% CI: 1.4–3.9). However, in a further study of 12 available tests, R_0 was found to be 3.28. Since R_0 represents an average value it is therefore necessary to reverse the position of super spreaders who may be very responsible for large-cluster outbreaks but who do not largely affect the value of R_0 . R_0 may be dysfunctional during the acute period of an epidemic or pracademic.

Control and prevention strategies

COVID-19 is obviously a globally severe illness. According to some figures, the reproductive number is greater than SARS and there have been claims that more people have been affected or died from it than SARS. Similar to SARS-CoV and MERS-CoV, breakage of the transmission chain is seen as important to the stopping of disease spread. In clinical settings both at local and global level, diverse policies can be placed in motion. Sadly, health care settings may be a significant source of viral transmission. As seen in the SARS model, triages are critical to reduce the further spread of the virus in clinics and hospitals, following correct steps of infection tests, isolation of cases and touch tracking. Suspected instances with respiratory illness in health centres (e.g., runny nose, headache, and cough) should use a face mask to control the influenza and strictly stick to triages.¹⁶ You should not be allowed to stay at the hospitals for other people needing medical attention. They should be put in a different, thoroughly ventilated space about 2 m apart from patients with venereal access to the supply of respiratory hygiene. In addition, if a reported COVID 19 case is to be hospitalised, a minimum of six air adjustments every hour should be imposed in one patient space with negative air pressure. Exhausted air must be treated by high efficiency particulate (HEPA) air, and medical people, such as manuals, gowns, disposable N95 and eye safety shall be worn in the rooms with personal protective equipment (PPE). The space should be decontaminated or disinfected after the cases are repaired and discharged and staff entering the room should wear PPE, in specific facemasks, gowns, eye-care. Isolating contaminated individuals is the primary measure to stop the spread in a group environment. For example, Chinese health authorities have taken decisive steps to isolate infectious individuals and quarantine the accused citizens and their near contacts. Furthermore, as there are already differing hypotheses about virus animal sources (i.e. some research related virus to bat while others have linked virus with snake, it should be possible to prevent interaction with certain animal fluids or tissues or wild animal intake. In addition, it's necessary to inform the public to identify irregular symptoms like persistent cough or short breath, so that they may pursue medical treatment to diagnose the virus early. When large-scale population transmission happened, it was important to reduce social gathers, close temporary classrooms, home evacuation, close monitoring of symptoms, life-support (e.g. oxygen supply, mechanical ventilating system), personal hygienic handling and wear-in personal safety devices as facemask.¹⁷ In the event that severe medical treatment is needed, air travel should be restricted. In order to detect suspicious incidents, it is mandatory to set up a temperature check or scan at both airport and frontier. Continued viral study is important to map the cause of the outbreak and to demonstrate potential outbreak.¹⁸

Conclusion

Clearly, the latest COVID-19 pandemic is a foreign promotional health concern. What we learned of the pathogen, about how it infects cells, induces illness and the clinical features of the disease have advanced rapidly. Due to quick transmission, countries across the world can pay greater attention to weak monitoring systems and increase preparation for country and response operations including the creation of fast response teams and the development of national laboratory system capability.

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