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A Mini-Review on Coronavirus Disease: A Novel Global Threat

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ABSTRACT

Introduction: Novel Coronavirus is a single-stranded RNA Virus infected by Severe Acute Respiratory Syndrome-Coronavirus-2 (SARS-CoV-2) which is first reported on Wuhan, China on January 7, 2020, and spreading all over the world rapidly. The new virus is threatening the whole world and the world is scared in front of the virus. WHO declared the outbreak as a pandemic on March 11, 2020.

Report: It is reported that the viral infection is transmitting via airborne from human to human or animal to human. Pneumonia, cough, sneezing, cold and respiratory disease are the main symptoms of this viral infection. Unfortunately, there are no vaccines or clinically proved antiviral drugs for COVID-19. So we should strictly keep social distance and should maintain personal hygiene. It is better to identify the active cases as soon as possible and isolate the infected ones to break further spreading.

Conclusion: In this review, we are discussing the background, etiology, transmission, clinical symptoms, Risk factors, treatment and preventive methods against COVID-19.

Key Words: Coronavirus, COVID-19, SARS-CoV-2, MERS-CoV, SARS-CoV

INTRODUCTION

Coronavirus (CoV) is a single-stranded RNA Virus.¹ It belongs to the family Coronaviridae, order Nidovirales and realm Riboviria.² This positive sense, single-stranded RNA virus can be isolated from different animal species including birds, livestock and mammals. These viruses consist of 26 to 32-kilo bases long RNA genome.^{3, 4, 5}

Severe Acute Respiratory Syndrome Related coronavirus (SARS-CoV) and the Middle East Respiratory Syndrome coronavirus (MERS-CoV) are two subtypes of CoV which are different from others showing mild clinical syndrome. MERS-CoV infection causes 858 fatalities out of 2,494 cases, in Saudi Arabia during 2012. Also in 2002, another subtype beta-CoV was responsible for 774 deaths in 37 countries.³ Now the new strain of CoV spreading rapidly all over the world with unknown aetiology.⁶ It starts spreading from Wuhan, China with symptoms resembling pneumonia. First, it was named as 2019-nCoV later on February 11, 2020 WHO designated the disease caused by this new virus as corona-

virus disease-2019 (COVID-19).^{4, 7} WHO officially declared the outbreak as a pandemic on March 11, 2020.⁸

Epidemiology

According to the report of WHO on March 3, 2020, worldwide there were 87317 COVID-19 cases.⁹ As of June 15, 2020, the WHO has reported 7823289 total confirmed cases and 431541 deaths globally. Also WHO reported 9845 death in India. According to WHO reports on June 15, 2020, 175503 cases were reported in Africa and 3781538 cases in America. 778200, 2416920, 471392, 198995 cases were reported in the Eastern Mediterranean, Europe, South-East Asia and Western Pacific respectively. As per WHO reports on June 14th 2020 in India there were 308,993 confirmed cases and 8,884 total deaths. To provide technical assistance, central teams are deputed in Mumbai, Ahmadabad, Chennai, Kolkata, Delhi and Bangalore since these six cities are reporting the highest number of cases. As on 21 June 2020, 08:00 IST Ministry of Health and Family Welfare (MoHFW) there were 169451 active cases, 227755 cured/discharged,

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13254 deaths and 1 migrated. Several active cases in Delhi on 21 June 2020 was 23340 and death reported are 2112. In Maharashtra total, active cases were 58068 and 5984 deaths were reported and the total number of confirmed cases in Maharashtra were 128205. 24825 active cases were reported in Tamil Nadu and 704 deaths were reported among 56845 total confirmed cases. Even though the death rate is increasing rapidly the number of cure or discharged ones are also increasing. 227756 peoples got cured among 410461 total confirmed cases. Graphical representation of the number of confirmed cases as on June 27, 2020, reported by WHO were shown in Figure 1.¹⁰

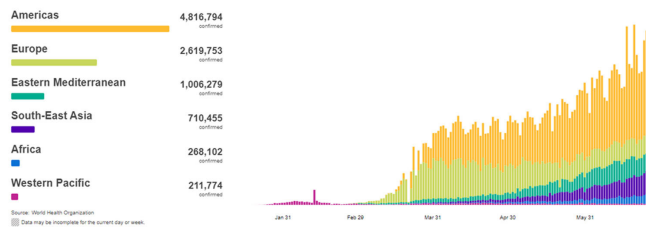


Figure 1: Global Situation by World Health Organization¹⁰

Transmission

First, it was claimed that the transmission mechanism is from animal to human because the first case of COVID-19 was reported had direct exposure to the Huanan Seafood Wholesale Market of Wuhan, China. But the eventual cases were not related to the same exposure mechanism. Finally, it was added up that transmission from human to human is also possible. Individuals with symptoms are the main source for spreading disease but still, people without symptoms can act as carriers of the virus and can spread the virus. Hence isolation and social distancing are the best way to control the pandemic.^{9,11} Transmission through a genital fluid is not yet reported. The disease is highly transmittable and pathogenic. Contact with respiratory droplets is one of the main reason for the transmission of COVID-19 rather than airborne.^{12, 13} Chances of getting the infection from an infected person are not less. Droplets released from the infected one through sneezing coughing or common cold¹⁴ can enter into an individual and stay within them and the individual will make the next chain. The unhygienic activities of the infected persons can contaminate anything he touches and causes further spreading. So it's better to keep a social distance of 1 meter (approximately 3 feet) from an infected person.^{15, 16} Transmission of the virus to human host is illustrated in Figure 2¹⁷ and Figure 3.¹⁸

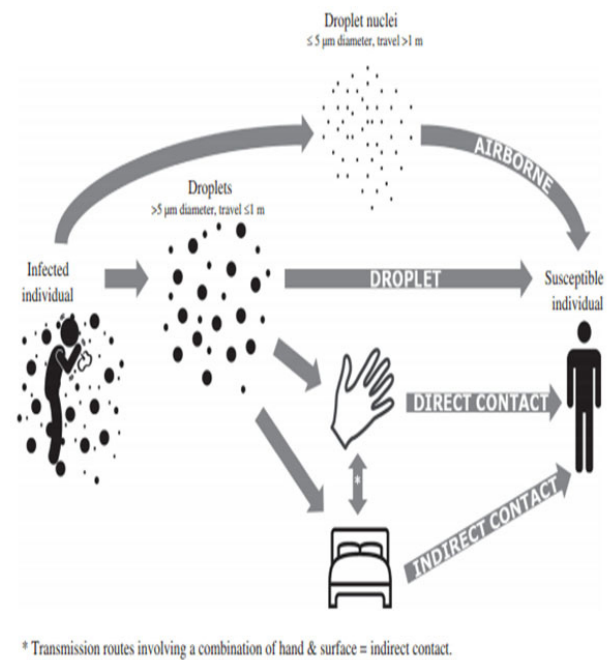


Figure 2: Transmission of the virus to the human host from an infected individual.¹⁷

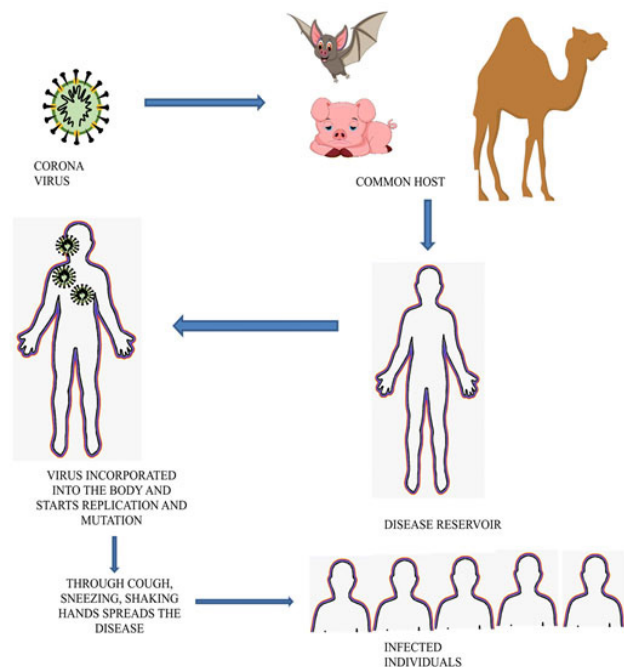


Figure 3: Transmission Of Virus To Human Host From Various Sources.¹⁸

Clinical symptoms

It is reported that fever and cough are the main and upper respiratory gastrointestinal symptoms are the rare symptoms shown by virus-infected persons.^{19, 20, 21} A recent study was conducted by Prof. Nan-Shan Zhong and his team on clinical

characteristics of Corona Disease 2019 in China. From their study, they reported that among 1099 laboratory-confirmed cases 88.7% shows a fever, 67.8% shows cough. In addition to this difficulty in breathing, sputum production, sore throat and headache were also evidenced in virus infected individuals.²¹ Vomiting and diarrhoea were also embodied in patients.^{22, 23, 24} By comparing with SARS-CoV²⁵, MERS-CoV²⁶ and Influenza²⁷ viral infections, the differences in symptoms are evident. Comparison of SARS-CoV 2, MERS-CoV and SARS-CoV were shown in Table 1.²⁸

Table 1: Comparison of SARS CoV-19 with Others²⁸

Conditions	SARS-CoV-2	MERS-CoV	SARS-CoV
Origin	Wuhan, China	Jeddah, Saudi Arabia	Guangdong, China
Incubation period	7 - 14	5.0 - 6.9	4.4 - 6.9
Age range	56 (22-92)	56 (14-94)	39.9 (1-91)
Mortality rate	2%	34%	9.6%
Symptoms			
Fever	93%	98%	99-100%
Dry cough	70%	47%	29-75%
Diarrhea	6%	26%	20-25%
Sore throat	4%	21%	13-25%
Dyspnea	35%	72%	40-42%

Risk Factors

Adult male of age between 34 to 59 shows SARS-Cov-2 infection mostly.^{22, 23, 29, 30} The chances of getting infected were quite more on adults more than 60 years old besides, having chronic cardiovascular and cerebrovascular diseases and diabetes.^{22, 24, 29} According to one study conducted in Wuhan, among 425 patients, no cases of children under 15 years were reported but by January 2020, cases of 28 pediatric patients been reported.^{31, 32} Children may show fewer symptoms compared to adults hence there is a chance of underestimating the pandemic among children.^{33, 34} In another study it was reported that 87% of confirmed cases were shown by adults, aged between 30-79 years. As the age increases mortality rate and case fatality rate increased 8% in age between 70 to 79 years and 15% in >80 years old patients.³⁵ Children showed mostly mild symptoms such as fever and cough and they are all recovered. It was reported that no infants were admitted in the intensive care unit and gave mechanical ventilation.^{36, 37}

Treatment

It is important to update ourselves on current treatments available for COVID-19 in every hour.³⁸ As if now the available data were collected from other viruses' clinical and pre-clinical data of their various antiviral therapies.^{39, 40, 41} Ensure full bed rest and supportive treatment for a COVID-19 patient. It is important to maintain our body electrolyte balance water content to avoid dehydration. Checking the vital signs is very important along with monitor the oxygen saturation. Chest imaging should be continuously monitored and blood test also should be examined periodically.⁴²

Beyond the explained general treatments symptomatic therapies are there, for those who are showing high fever antipyretic drugs are used. In addition to antipyretic drugs taking bath on warm water is also preferable. For those who are showing convulsions or seizure sedatives are also can be prescribed.^{11, 42, 43} As the viral infection affect lungs there are chances of getting hypoxia. In such a condition, it is advisable to provide nasal catheter and oxygen mask.⁴⁰ Antiviral drugs used for the diagnosis treatment and prevention of COVID-19 by NHC of Peoples Republic China were listed in Table 2.⁴²

Table 2: Drugs with the mode of administration and their duration.⁴²

Drugs	Mode of administration	Duration
Arbidol	Oral	No more than 10 days
Ribavirin	Intravenous Infusion	No more than 10 days
Lopinavir/Ritonavir	Oral	No more than 10 days
Chloroquine Phosphate	Oral	No more than 10 days
IFN-α	Vapour inhalation	No more than 10 days

Prevention is better than cure

We have to be very careful in maintaining personal hygiene. Care should be taken to wash our hands a minimum of 20 seconds with soap and water. In case if it is not possible to use an alcohol-based hand rub or sanitizers having 70% alcohol and clean in such a way that should completely cover our hands and air dry it. Stay aware to do these after a public place visit, sneezing or coughing. Use mask and gloves as a part of personal hygiene. Be careful to avoid touching our eyes, nose, mouth after touching many surfaces with bare hands because it can cause the transfer of viruses from those surfaces to our body. Stay aware to keep a distance of at least 1 meter between persons to persons to avoid close contact with infected ones. It is advisable to avoid attending marriage functions and large gatherings.^{44, 45, 49} Always keep in mind "PREVENTION IS BETTER THAN CURE", Figure 4.⁴⁶



Figure 4: Symptoms and Precaution to be Taken to Avoid Spreading of Virus.⁴⁶

If you have any symptoms like fever, cough, breathing difficulties seek medical aid from your doctor and it is advisable to stay home and keep the social distance from others. It is better to avoid travelling in public transport and use private transportation. Use a tissue paper to cover your mouth or nose while coughing or sneezing and used tissue paper should keep in the dust bin. Use mask and gloves. After the usage of tissue for sneezing and coughing wash your hands with soap or use hand sanitizers containing 70% of alcohol. If possible it is good to be quarantined. Room quarantine is also advisable. Those who are entering into the room should cover their face and stay alert. Stay aware to avoid sharing beddings utensils clothes if you are sick. It is advisable to use separate toilets and bathroom. Care should be taken to disinfect the surfaces and utensils. Stay home until you become devoid of disease.⁴⁷ Healthcare professionals are playing a pivotal role in this pandemic situation and are at high risk of infection. It is also essential for them to take care of themselves while treating Covid 19 positive patients. They must use PPE (Personal Protective Equipment), proper handwashing using goggles or face shields.⁴⁸

CONCLUSION

COVID -19 is a viral infectious disease which is spreading dangerously all over the world. As of June 15, 2020, the WHO has reported 7823289 total confirmed cases and 431541 deaths globally. WHO reported officially declared this outbreak as pandemic on March 11, 2020. The disease is spreading through droplets. So it is advisable to keep social distance to break the spreading of the outbreak. Using mask and gloves is the primary precautions that should be taken by individuals. We should stay aware to wash our hands with soap and water for 20 seconds or else can use a hand sanitizer containing 70% alcohol instead of soap. Above all this, it is important to boost our immune system as a part of preven-

tion and it is advisable to have good foods to improve immunity. Don't be panic about this outbreak and be sure that you are getting good sleep in this difficult time. Stay aware of the instructions given by the Government on this pandemic.

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Conflict of interest

There is no conflict of interest

Ethical approval

Not Applicable

Informed consent

This article does not contain any studies with human or animal subjects so that there is no informed consent to be attached.

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