WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 9, Issue 13, 380-390. Review Article ISSN 2277– 7105

A REVIEW ON CORONAVIRUS (COVID-19) DISEASE

Pallavi Gholap[1]* and Kiran Mahajan

Sharadchandra Pawar College of Pharmacy, Otur, Pune-412409.

Article Received on
25 August 2020,

Revised on 14 Sept. 2020,
Accepted on 05 October 2020

DOI: 10.20959/wjpr202013-18962

***Corresponding Author**
Pallavi Gholap
Sharadchandra Pawar College of Pharmacy, Otur, Pune-412409.

ABSTRACT

In early December 2019, an outbreak of coronavirus disease 2019 (COVID-19), caused by a novel severe acute respiratory syndrome coronavirus (SAR-CoV-2), occurred in Wuhan City, Hubai Province, China. On January 30, 2020 the World Health Organization declared the outbreak as a Public Health Emergency of International concern. We here summarize the current clinical characteristics data to guide potential COVID-19 about Diagnosis and Prevention of COVID-19. In this review, we extracted data from various Research Report, WHO guidelines and other articles. It is important to caution the readers that new data updating nearly every hours regarding clinical characteristics, diagnosis, treatment strategies, and outcomes COVID-19. Throughout the world the disease has caused varying degrees of illness. Patient shows various symptoms like as fever, cough, sore throat, breathlessness, fatigue etc. The disease is being cured by general treatment, symptomatic treatment by using oxygen therapy and by the immune system. Now identify the corona positive patients and isolate/ separate them from other people.

KEYWORDS: Coronavirus, Covid- 19, Novel coronavirus, SARS-CoV-2.

INTRODUCTION

During the month of Dec 2019, a considerable number of patients developed pneumonia of unknown cause in the capital city Wuhan of Hubei province in China, with clinical presentations greatly resembling viral pneumonia but some rapidly progressed to severe illness and fatal outcome. These cases had history of exposure to Huanan Seafood Wholesale Market where live animals were also on sale. The disease then rapidly spread from Wuhan to other areas. By the first week of Jan 2020, a novel coronavirus was identified by the chinesecentre for disease control and prevention (CDC) from the throat swab sample of these patients, and the virus was named 2019 novel coronavirus (2019-nCoV). Although the initial

spread had some link to exposure at the seafood and animal market, a growing number of patients reportedly had not expose to animal markets, indicating human-to-human spread. An outbreak of the 2019-nCoV occurred, spreading rapidly to the other regions of China as well as in a number of other countries. Cases reported in countries other than China have predominantly been in people who have recently traveled to China, however some cases of local transmission have also occurred. Due to rapid global spread the World Health Organization (WHO) on January 30 declared the outbreak as a public health emergency of international concern. On 11 February 2020, WHO announced that "COVID 19" (coronavirus disease 2019) will be the official name of the disease. The Coronavirus Study Group of the International Committee on Taxonomy of Viruses, which is responsible for naming new viruses, recognized this virus as a sister species to severe acute respiratory syndrome coronaviruses and on 11 Feb 2020, posted online a preprint paper designating it as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).

So far till 11 Mar 2020, it has spread outside China with confirmed infection of 37,364 in 113 countries with a total fatality of 1130 outside China. More and more countries are involved day by day with the increase in number of cases and fatality. In China, as on 11 Mar 2020, total confirmed cases were 80,995 and total deaths were 3162. WHO has been deeply concerned by the alarming levels of spread and therefore, on 11 Mar 2020 made the assessment that COVID- 19 can be characterized as pandemic.[1-6]

CORONAVIRUS

Coronavirus are widely distributed in many different species of animals, including bats, cattle, cats, birds and camels. Coronavirus is also one of the pathogens that causes respiratory tract infection in humans. SAR-nCoV-2 is a member of the family Coronaviridae and order Nidovirales. The family consists of subfamilies, Coronaviridae and Torovirinae and members of the subfamily Coronavirinae are subdivided into four genera:

a) Alphacoronavirus contains the human coronavirus (HCoV)-229E and HCoV-NL63;
b) Betacoronavirus includes HCoV-OC43, Severe Acute Respiratory Syndrome human coronavirus (SARS-HCoV),HCoV-HKU1, and Middle Eastern Respiratory Syndrome Coronavirus (MERS-CoV);
c) Gammacoronavirus includes viruses if whales and birds and;
d) Deltacoronavirusincludes viruses isolated from pigs and birds. SARS-CoV-2 belongs to Betacoronavirus together with two highly pathogenic viruses, SARS-CoV and MERS-

CoV. SARS-CoV-2 is an enveloped and positive sense single stranded RNA (++ssRNA) virus.

Electron micrographs of 2019-nCoV particles were generally spherical, enveloped with some plenomorphism. Diameter varied from about 60 to 140 nm. Coronavirus are RNA virus and the virus particles have quite disinfective spikes, about 9 to 12 nm, which give them the appearance of a solar corona. Due to, genetic similarities between the new coronavirus and the coronavirus that caused the SARS outbreak in 2002-2003, recently the new virus has been renamed as SARS-CoV-2.[4-8]

Table No. 1: How long do coronavirus lives on surfaces.

SURFACE	EXAMPLES	DAYS or HOURS
Metal	Doorknobs, Jewelry, Silverware	5 Days
Glass	Drinking glasses, Mirrors, Windows	Upto 5 Days
Ceramics	Dishes, Pottery, Mugs	5 Days
Paper	Newspaper, Magazines	Upto 5 Days
Wood	Furniture, Decking	4 Days
Plastics	Milk bottles, Bus seats, Elevator buttons	2-3 Days
Stainless steel	Refrigerator, Pots/ pans, Sinks, Water bottles	2-3 Days
Cardboard	Shipping boxes	1 Day
Aluminum	Soda cans, Tinfoil, Water bottles	2-8 Hours
Copper	Pennses, Teakettles, Cookware	4 Hours

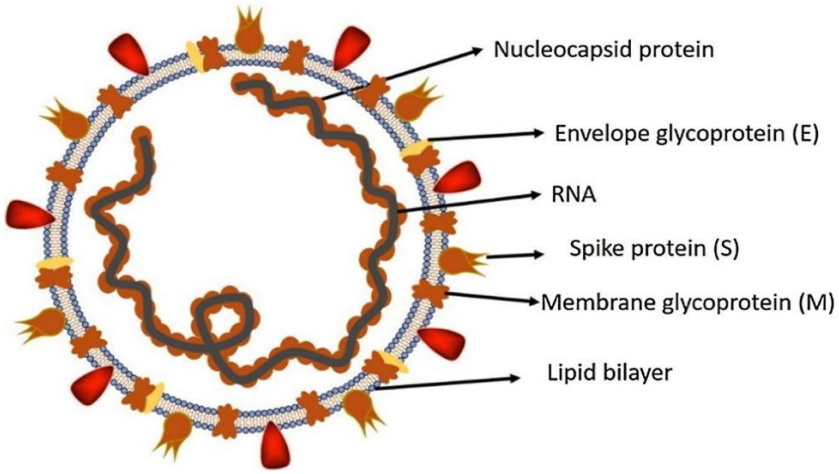

Fig 1: Structure of SARS Coronavirus

Treatment

Similar to MERS-CoV and SARS-CoV, there is still no specific antiviral treatment for COVID-19. Isolation and supportive care including oxygen therapy, fluid management and antibiotics treatment for secondary bacterial infections is recommended. Some COVID-19

patients progressed rapidly to ARDS and septic shock, which was eventually followed by multiple organ failure. Therefore, the effort on initial management of COVID-19 must be addressed to the early recognition of the suspect and contain the disease spread by immediate isolation and infection control measures.

In the various studies, empirical antibiotics (including azithromycin, cephalosporin, quinolines, vancomycin, carbapenems, tigecycline) and investigational antivirals (includingoseltamivir, remdesivir, lopinavir, ritonavir) were used in most cases for treatment of patients with 2019-nCoV infection, however, no effective outcomes were observed. Due to development of pneumonia, antibiotics were used to cover common pathogens and often methicillin resistant staphylococcus; when secondary bacterial infection occurred, medications was administered according to the results of bacterial culture and drug sensitivity.

Neither is a treatment available. Therefore the management of the disease has been mostly supportive referring to the disease severity which has been introduced by WHO. If sepsis is identified, empiric antibiotics should be administered based on clinical diagnosis and local epidemiology and susceptibility information. Routine glucortocoroid administered are not recommended to use unless there are another indication. Clinical evidence also does not support cortisteriod treatment. Use of intravenous immunoglobulin might help for severely ill patients.

At last trails with a considerable number of investigational agents like lopinavir, ritonavir, remdesivir, nelfiavir, interferon beta, chloroquine, Chinese traditional medicine are being carried out since Jan 2020; some of them were suggested that they may be effective for treating the 2019-nCoV; even that, the efficacy and long term safety of those drugs still need to be further confirmed by clinical experiments.[9-15]

Origin

The first cases of coronavirus in human found in 1965 by Tyrrell and Bynoe. They observed that they could passage a virus named 8814. It was observed in human embryonic tracheal organ cultures obtained from the respiratory tract of an adult with a common cold symptom. The first caseswere seen in Wuhan City of Hubei Province China in December 2019, and have been linked to the Huanan Seafood Market (South China) and the infection has spread to several countries around the world.

The novel coronavirus originated from the Hunan seafood market at Wuhan, South China were raccoon dogs, bats, snakes, palmcivets and other animals are sold and rapidly spread upto109 countries. The zoonotic source of SARS-CoV-2 is not confirmed, however, the sequence based analysis suggested bats as the main reservoir. The recombination of DNA was found to be involved at spike glycoprotein which assorted SARS-CoV(CoVZXC21 or CoVZC45) with the RBD of another Beta CoV,thus could be the reason for cross species transmission and rapid infection.[15-17]

Transmission

The virus that causes coronavirusdisease 19 (COVID 19) is a highly transmittable and pathogenic viral infection and mainly transmitted through contact with respiratory droplets rather than through the air. Primarily people can catch coronavirus disease 19 (COVID-19) from others who are infected. A single cough can circulate up to 3000 droplets. These droplets can load on other people, and covering surfaces around them, however, several smaller particles will stay within the air, the virus is also shed for extended in faecal matter, thus anyone who not washing their hands thoroughly after visiting the toilet, bathroom could contaminate anything they touch like many respiratory viruses, including flu, Covid-19 can be spread by close contact with small droplets released from infected individuals upper respiratory tract secretions. E.g. sneezing, common cold or coughing from the nose and mouth. That's why to stay more than 1 meter (3 feet) away from a person who is sick. The virus can also be transmitted through surface contamination when these droplets land on objects and surfaces around the person and other individual touches these objects or surfaces and further touching their eyes, nose or mouth then these people catch COVID-19.[18-19]

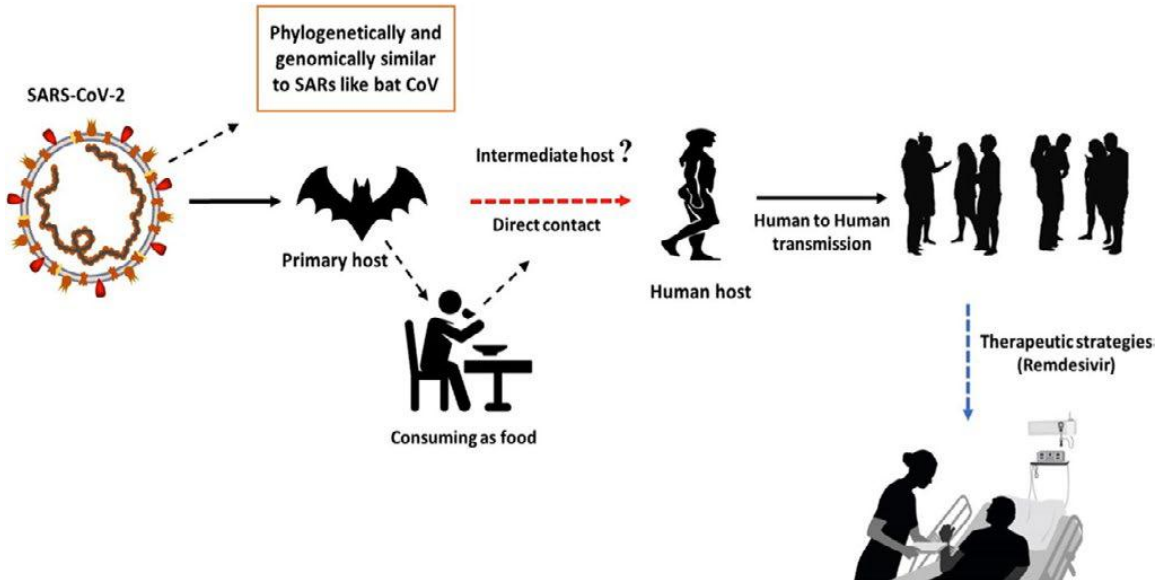

Fig. 2: Transmission of coronavirus to human host cell.

Symptoms

Maximum of the patients infected with the virus will experience common cold and flu, while fee of them remain asymptomatic. 80% of patients will show mild symptoms of the disease. Adults have the best immunity to fight against the infection but the demerits is that they are more likely to spread the infection.

A recent study of nearly 140 patients at the Zhongnan Hospital of Wuhan University identified different types of symptom, which is lead to disease known as COVID-19. 99% of the patients developed a fever with extremely high temperature, while more than half experienced fatigue and a dry cough. One third of the patients developed a dry cough and difficulty in breathing.

Research from the Chinese CDC observe that around 80% of coronavirus cases are mild, around 15% of patients have infected severe cases, and 5% have become criticallyill. A day by day breakdown of coronavirus symptoms shows how symptoms progress among typical patients, how the disease, COVID-19, goes from bad to worse.

Day 1: In the starting day of the symptom, the patient suffers from fever along with fatigue, muscle pain, and a dry cough, few of them may experience nausea and diarrhoea a few days before the arousal of symptoms.

Day 5: Patients may suffer from breathing problem especially if they are elderly or have some pre- existing health condition.

Day 7: According to the Wuhan University study, these are the symptoms of the patients that lead the patient to be admitted in the hospital.

Day 8: On the 8th day, patients (15% according to the Chinese CDC) develop acute respiratory distress syndrome (ARDS), a condition where the fluid fills up in the lungs and this is mostly fatal. This usually happens in Severe cases.

Day 10: Theprogression of the disease leads to worsening of the symptom and at this point the patient is shifted to ICU. Patients with milder symptoms probably have more abdominal pain and loss of appetite. Only a small fraction die. The current mortality rate is around 2%.

Day 17: On average, after two-and-a-half weeks patients who recover are discharged from the hospital.

However, it's difficult to find out the symptoms in the earlier days of the infection. This is usually seen after 5-6 days. Reported symptoms have ranged from mild to severe illness and death for confirmed coronavirus disease 2019 cases.

Emergency warning signs of COVID-19 needs medical attention immediately, continuous pain or pressure in the chest, include trouble in breathing, confusion and bluish lips or face. The progressed condition leads to Pneumonia and the incubation period is yet to be determined as virus is recently identified. As per the new information, symptoms could appear as soon as three days after exposure to as long as 13 days later. Recently published research found that on average, the incubation period is about five days.[20]

Prevention and precautions of COVID-19

People should stay aware of the latest information on the COVID-19 outbreak provided by WHO and follow the directions of your local health authority and prevent secondary infections, interrupt human-to-human transmission to your close contacts, health care workers and prevent further international spread. Most of the people who infected, experience mild illness and recover it, but it's infection can be more severe for other individuals. To take care of your health and protect others take the subsequent steps:

Take steps to protect yourself

- Wash your hands regularly and thoroughly with soap and water for at least 20 Seconds or with an alcohol based hand rub (hand sanitizer that contain at least 60% alcohol) completely cover your hands and rub them together until they do not dry especially after you have been visited a public place, or after blowing your nose, sneezing or coughing.

- Hands touch many surfaces and pick up viruses and these contaminated hands, can transfer the virus to your nose, eyes and mouth so, avoid touching these organs with unwashed hands. Because from there, the virus can enter the body and cause person to sick.
- Maintain social distancing (maintain at least 1 meter or 3 feet distance between yourself and anyone) and avoid clot contact with people who are sick (who is coughing or sneezing). When infected individuals cough or sneezes, they spray small droplets from their nose or mouth which contains COVID-19 virus. The person can breathe in these droplets.
- Avoid large events and mass gatherings

Take steps to protect others

- Stay home if you are feeling unwell, unless you are going to get medical care**.**
- If you have cough, fever and difficulty breathing, seek medical attention consult online to your doctor.
- If you are sickavoid taking public transportation.
- Whenever you cough or sneeze cover your mouth and nose with a tissue paper.
- Throw used tissues in the trash and wash your hands immediately with antiseptic soap and water.
- If possible stay isolated in a separate room from family and pets and wear facemask when you are around other people. If you are unable to use facemask then you should cover your coughs andsneezes, and but when the people who are caring for you enter your room they should wear a facemask.
- Stay home for duration of time and follow your doctors instructions.
- If you are sick avoid sharing bedding, dishes, glasses and another household items.
- If possible use separate bathroom and toilet from the family.
- If surfaces are dirty, clean them, and use detergent or antiseptic soap and water before disinfection apply.
- Apply disinfectant daily on frequently touched surfaces. This includes desks, phones, keyboards, toilets, faucets, tables, doorknobs, light switches, countertops, handles and sicks.
- Identify and isolate suspected cases.[21-24]

CONCLUSION

The current COVID-19 pandemic is clearly an international public health problem. Through this review, we conclude that the disease profile of COVID-19 is dynamic and continuous rapidly evolve. Due to rapid transmission, countries around the world should increase attention into disease surveillance systems and scale up country readiness and response operations including establishing rapid response teams and improving the capacity of national laboratory system. This pandemic can be cure by antiviral, antibiotics and antimalarial drugs. Only ones the pandemic ends, one will be able to assess the health, social and economic impact of this global disaster and we should able to learn lessons especially in terms of public and global health for any future similar pandemics.

REFERENCES

1. World Health Organization. Novel coronavirus - China; 12 Jan, 2020. Available: http://www.who.int/car/don/12- January-2020-novel-coronavirus-china/en/ (Accessed on 28 Jan 2020)
2. Report of clustering pneumonia of unknown etiology in Wuhan City. Wuhan Municipal Health Commission; 2019. Available:http://wjw.wuhan.gov.cn/front/web/showDetail/2019123108989
3. World Health Organization. Statement on the second meeting of the International Health Regulations (2005) Emergency Committee regarding the outbreak of novel coronavirus (2019-nCoV); 30 Jan, 2020. Available: http://www.who.int/news-room/ detail/30-01-2020 (Accessed on 02 Feb 2020)
4. Gorbalenya, Alexander E. Severe acute respiratory syndrome-related coronavirus- The species and it's viruses, a statement of the Coronavirus Study Group. Posted on 11 February 2020. bioRxiv:2020.02.07.937862.
5. World Health Organization. Coronavirus disease 2019 (COVID-19) Situation Report-51. Data as reported by national authorities by 10 AM CET 11 March 2020. Available:https://www.who.int/docs/default-source/coronavirus/situation reports /20200 311-sitrep-51-covid-19.pdf?sfvrsn=1ba62e57 10 (Accessed on 13 Mar 2020)
6. Weiss SR, Leibowitz JL. Coronavirus pathogenesis. Adv Virus Res., 2011; 81: 85-164.
7. Burrell C, Howard C, Murphy F. Fenner and White's medical virology. 5th ed. United States: Academic Press, 2016.
8. Kramer A, Schwebke I, Kampf G. How long do nosocomial pathogens persist on inanimate surfaces? A systematic review. BMC Infect Dis., 2006; 6: 130.

9. Huang C, Wang Y, Li X,Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China, Lancet, 2020.
10. Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, et al. Epidemiological and clinical characteristics of 99 cases of novel coronavirus pneumonia in Wuhan, China: a descriptive study. Lancet, 2020.
11. Tang JW, Tambyah PA, Hui DSC. Emergence of a novel coronavirus causing respiratory illness from Wuhan, China. J Infect, 2020.
12. Habibzaded P, Stoneman EK. The novel coronavirus: a bird's eye view.Int J Occup Environ Med., 2020; 11(2): 65-71.
13. Organization WH, Global surveillance for human infection with novel coronavirus (2019-nCoV), 2020.
14. Organization WH. Clinical management of severe acute respiratory infection when novel coronavirus (2019-nCoV) infection is suspected, 2020.
15. Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, et al. Clinical characteristics of 138 Hospitalized Patients with 2019 Novel Coronavirus- infected Pneumonia in Wuhan, China. JAMA.
16. Murphy A, and Bell DJ,et al. COVID-19, Radiopedia. https://radiopaedia. org/ articles/ covid-19-2?lang=us.
17. Shereen M.A, Khan S, COVID-19 infection: origin, transmission and characteristics of human coronaviruses Journal of Advanced Research, 16 March 2020.
18. WHOQ & A on coronavirus (COVID-19). https://www.who.int/news-room/q-a-coronaviruses.
19. Alaska department of Health and Social services, Human Coronaviruses, https://dhass.alaska.gov/dph/Epi/I'd/Pages/Human-Coronavirous.aspx
20. Coronavirus Resource Center, Harvard Medical School, Harvard Health Publishing, Mar.2020. https://www.health.harvard.edu/disease-and-conditions/coronavirus-resource-center#COVID
21. WHO Coronavirus disease 2019 (COVID-19) Situation Report-53, March 2020 https:// www.who.int/docs/default-source/coronavirus/situation-reports/20200313-sitrep-53-covid-19.pdf?sfvrsn=adb3f72_2
22. WHO Coronavirus disease (COVID-19) advice for the public.https://www.who int/emergencies/diseases/novel-coronavirous-2019/advice-for-public

23. How to Protect Yourself, Coronavirus Disease 2019 (COVID-Coronavirus Disease 2019 (COVID-19), Center for disease control and prevention. https://www.cdc.gov/coronavirus/2019-nCoV/prepare/prevention.html
24. COVID-19, Occupational safety and Health Administration, United States Department of labour, https://www.osha.gov/SLTC/covid-19/controlprevention.html