

A Brief View on Pandemic Virus COVID-19

Deepa Yadav¹, Hitesh Kumar Dewangan¹, Shailesh Kumar Gupta², Priyanka Srivastava²

¹Department of Pharmaceutical Science, GLA Institute of Pharmaceutical Research, Uttarpradesh, India

²Department of Pharmaceutical Science, Mahavidyalaya college of Pharmacy Gonda, Uttarpradesh, India

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ABSTRACT

COVID-19 is related to coronary pandemic diseases. This virus is spreading from Wuhan city, China by unknown sources. It is severe respiratory diseases that are diagnosed with pneumonia. Incubation period of this virus is from 2-14 days. Today there are number of deaths and infection due to this virus. Presently our country (India) is having worst condition from this virus. India is suffered from second wave of COVID-19. Due to the mutation of this virus second wave is more dangerous in comparison of previous. This paper pro-

vides information about COVID-19 with its pathogenesis, symptoms, diagnosis, and prevention of these diseases.

Keywords: COVID-19, Respiratory syndrome, Pathogenesis

Correspondence: Deepa Yadav, Department of Pharmaceutical Science, GLA Institute of Pharmaceutical Research, Uttarpradesh, India, E-mail: deepayadav.pharma@gmail.com

INTRODUCTION

The 2019 novel corona virus diseases are originated from Wuhan city of Hubei province of China to the whole world (Fahmi M, *et al.*, 2020). It is a type of sever acute respiratory syndrome i.e. corona virus 2(SARS-CoV-2). The presence of COVID 19 is diagnosed by pneumonia with common symptom including fever, cough, throat infection, and loss of taste or smell, muscle pain and finally shortness of breath that results in death of patient (Chen L, *et al.*, 2020; Rokni M, *et al.*, 2020). World Health Organization (WHO) gave a nomenclature to this virus as 2019 novel corona virus (2019-nCoV). The International Committee on Taxonomy of Viruses (ICTV) gave name to this virus Severe Acute Respiratory Syndrome coronavirus-2 (SARS-CoV-2). World Health Organization declares it pandemic situation towards the world (Chavez S, *et al.*, 2020).

STRUCTURE OF CORONA VIRUS

Corona virus is characterized by positive single RNA strands enclosed with glycoprotein. They were having size from 60 nm-140 nm in diameter (Chen G, *et al.*, 2020; Lechien JR, *et al.*, 2020) they were having spike like projections when seen under electron microscope (Figure 1).

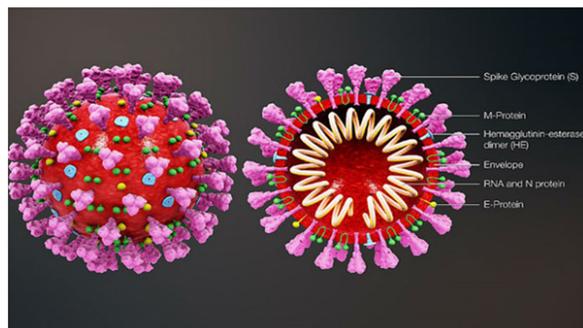


Figure 1: Structure of corona virus

COVID-19 is related with Coronaviridae family, this family consists of two subfamilies, Coronavirinae and Torovirinae (Wong SH, *et al.*, 2020). Coronavirinae are subdivided into 4 genus (Rossi ED, *et al.*, 2020; Lin L, *et al.*, 2020).

1. Alphacoronavirus contains the human corona virus (HCoV)-22 and HCoV-NL63
2. Betacoronavirus includes HCoV-OC43, Severe Acute Res-

piratory Syndrome human corona virus (SARS-HCoV), HCoV-HKU1, and Middle Eastern respiratory syndrome corona virus (MERS-CoV)

3. Gamma corona viruses include viruses of whales and birds.
4. Delta corona viruses include viruses isolated from pigs and birds.

SARS-CoV-2 belongs to beta coronavirus together with two highly pathogenic viruses, SARS-CoV and MERS-CoV. SARS-CoV-2 that is enveloped by single stranded RNA (Wang C, *et al.*, 2020; Worldometer, 2020).

Pathogenesis

COVID-19 is started with viral pneumonia with common symptoms like fever, headache, and shortness of breath. Incubation period of this disease is from 2-14 days. SARS-CoV-2 is single stranded RNA virus (Richman DD, *et al.*, 2016). It encodes 27 proteins, that having four structural proteins i.e. Spike, envelope, membrane, and nucleocapsid. Spike protein is responsible for receptor binding and viral entry in host cell (Chan-Young M and Xu RH, 2003). Lungs are the initial site for this viral infection. It binds to the surface of respiratory cells, mediated by spike viral protein. Angiotensin receptor 2 (ACE2) is the receptor by which the virus enters in respiratory mucosa. Angiotensin receptor 2 is metalloproteinase, made up of 805 amino acids (WHO, 2020). SARS-CoV-2 enters in host body and replicates in target cells through the binding of spike proteins to ACE2, after this it infect new target cell (WHO, 2021). SARS-CoV-2 having better binding capacity in comparison of SARS-CoV. Drugs that interfere with interaction of spike protein and ACE2 may prevent viral infection (Xinhua, 2021). Binding of spike protein to ACE2 results conformational change in S-glycoprotein permitting proteolysis of ACE2 by Trans membrane serine protease 2, this results in generation of S1 and S2 subunits, that can be responsible for membrane fusion and virus internalization by the process of endocytosis in pulmonary epithelium and finally this virus multiply and cell transmit (Huang C, *et al.*, 2020; Rothe C, *et al.*, 2020).

Symptoms and transmission

Incubation period of SARS-CoV-2 is from 2-7 days. It is started with symptoms like cough, fever, headache, sneezing, throat infection after this it observed as shortness of breath and chest infection. Social contacting is mainly responsible for spreading of SARS-CoV-2 virus infection. By sneezing and coughing this virus is transmit from infected to non-infected person. Sputum, saliva,

urine and stool of infected person contains SARS-CoV-2 virus. This virus is also transmitting by conjunctiva secretion (Li Q, *et al.*, 2020). It can be transmit by oral, nasal, ophthalmic route. For avoiding transmit of this infection, it is mandatory to maintain six feet distance, always wearing face mask, face shield, and gloves to minimize the transmission of virus. Use of hand sanitizer or any surfactants are helpful for avoiding the risk of transmission. COVID-19 can be transmitting by direct or indirect contact with infected person, through infected surface, infected object or environment. To avoid this transmission, infected person are suggested to live in isolation (Zhang L and Liu Y, 2020).

Prevention and diagnosis

Transmission of SARS-CoV-2 virus can be only prevented by avoiding direct or indirect contact with infected person (Zhonghua J *et al.*, 2020). Infection can be control by wearing face mask, PPE kit (Personal Protective Equipment). It can be minimize by using disinfectant or hand sanitizer. It is control under hygienic condition. It can be diagnosed by NGS kit (Next Generation genome Sequencing) and RT-PCR kit (reverse transcription polymerase chain reaction). It gives results in 2-3 hours. NGS kit is highly costly in comparison of RT-PCR kit. One more kit is available that is immunology testing kit. It includes detection of IgM and IgG against SARS-CoV-2 in 15 minutes (WHO, 2019).

CONCLUSION

This new virus has disturbed the economy towards all over world. SARS-CoV-2 finally affects the respiratory system of infected person. It transmits only through social contacting. Best way for avoiding the transmission of virus is to maintain social distancing.

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AUTHOR CONTRIBUTIONS

All authors have an equal contribution.

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