



## A REVIEW ON NOVEL CORONAVIRUS 2019(COVID-19) OUTBREAK

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### ABSTRACT

COVID-19 is a novel coronavirus which rapidly spread around the world. It is highly contagious disease and first originated in Wuhan China on December 2019. On 30<sup>th</sup> January 2020, WHO declared COVID-19 outbreak as a public health emergency of international concern. Till 3<sup>rd</sup> April 2020 globally there have been 972303 reported cases and 50321 reported death. Out of these in India there have been 3229 reported cases. Researches is going on till now to developed a vaccine to treating this viral infection based on the current evidences here we summarize about the characteristic , epidemiology , mode of transmission , diagnosis, preventive measures and treatment of COVID-19.

**Keywords:** COVID-19, Coronavirus , Contagious, Vaccine

### 1. INTRODUCTION

Coronaviruses are large enveloped virus caused respiratory tract infection in human. It belongs to the family coronaviridae. Because of their crown like appearance they are known as corona. Coronaviruses are single stranded positive sense RNA virus. Nucleocapsid is helical symmetry having 9-11nm in diameter. There are 20nm long club or petal shaped projection present on the outer surface of the envelope. The viral structural proteins contain a 50-60kDa phosphorylated nucleocapsid protein, 20-35kDa membrane glycoprotein. Coronaviridae family contains two subfamilies *i.e.* Torovirinae and Coronavirinae [1, 2]. Coronavirinae have four gene-alpha coronavirus, beta-coronavirus, gamma-coronavirus and delta-coronavirus. Out of these four genera most of all human infectious coronavirus belongs to betacoronavirus. There are six previously known human coronavirus are present. These are; Human coronavirus 229E, Human coronavirus NL63, Human coronavirus OC43, Human corona virus HKU1, SARS-CoV and MERS-CoV [1]. SARS CoV (severe acute respiratory syndrome) first recognized in china in 2003 which spread in 29 countries and about 8098 cases reported. In Saudi Arabia 2012, MERS-CoV (Middle East respiratory syndrome coronavirus) was first reported. In MERS-CoV 1366 confirmed cases reported. COVID-19 is a novel seven number of human infection causing coronavirus its also belong to

betacoronavirus. It is highly contagious among all the human coronavirus [1].

In this review we summarize the characteristics, epidemiology, mode of transmission, diagnosis, preventive measures and treatment of COVID-19.

### 2. CHARACTERISTICS

COVID-19 is encoded by an additional glycoprotein that has acetyl esterase and hemagglutination (HE) properties. Comparison of the genome sequences of the COVID-19, SARS-CoV, and MERS-CoV showed that 2019-CoV has a better sequence identity with SARS-CoV than the MERS CoV6 [3]. From various researches it was found that in COVID-19, amino acid sequence also varies from other coronaviruses exclusively in the regions of 1ab polyprotein and surface glycoprotein or S-protein.

### 3. EPIDEMIOLOGY

In December 2019, novel Coronavirus (nCoV), has emerged in the Huanan Seafood Market, where livestock animals are also traded, in Wuhan State of Hubei Province in China and has been the focus of global attention due to a pneumonia epidemic of unknown cause [4]. At first, an unknown pneumonia case was detected on December 12, 2019, and possible influenza and other coronaviruses were ruled out by laboratory testing. Chinese authorities announced on January 7, 2020 that a new type of Coronavirus (novel Coronavirus, nCoV) was isolated [4]. This virus was named as COVID-

19 by WHO on January 12. When first cases found, the infection was probably transmitted from animal to human but after many cases indicates that second transmission may occur human to human. Till now from WHO report that there have been 972303 reported cases and 50321 reported death in the world.

**Table 1: Total number of reported cases of COVID-19 in the world till 3<sup>rd</sup> April 2020 as per WHO [5]**

Region	Total Confirmed cases	Total deaths
Western Pacific Region	108930	3760
European Region	541808	37103
South-East Asia Region	5881	245
Eastern Mediterranean Region	62236	3438
Region of the Americas	247473	5600
African Region	5263	164

#### 4. TRANSMISSION

Up to mid of January there was no clear evidence of human to human transmission [6]. Because when first case originated the infection is probably transmitted from animal to human but after many cases indicates that transmission may occur to human to human. In human transmission occurs with close contact. The transmission primarily occurs when an infected person sneezing and coughing. Through the respiratory droplets transmission may occur.

#### 5. CLINICAL MANIFESTATION

In COVID-19 incubation period is approximately 2-14 days. It may cause disease ranging from asymptomatic to fatal disease. Studies have shown higher viral loads in the nasal cavity as compared to the throat with no difference in viral burden between symptomatic and asymptomatic people [7]. COVID-19 infects the lower respiratory tract with the potential of leading to fatal pneumonia. Other non-specific symptoms include fever, cough, myalgia, difficulty in breathing, with or without diarrhea.

#### 6. DIAGNOSIS

In COVID-19 infection, suspected cases were diagnosed by specific molecular test. Suspected cases the one which

have fever, sore throat, cough, body pain and who has travel history to China or other infected area or the patient with similar travel history. For molecular test respiratory sample will be taken from throat swab, sputum and lower respiratory secretion samples. In a suspect case in India, the appropriate sample has to be sent to designated reference labs in India or the National Institute of Virology in Pune [2]. For patients with suspected infection, the following procedures have been suggested for diagnosis: performing real-time fluorescence (RT-PCR) to detect the positive nucleic acid of SARS-CoV-2 in sputum, throat swabs, and secretions of the lower respiratory tract samples [8]. In screening/ laboratory test WBC count may vary which may occur leucopenia which is more common and range will be less than  $4000/\text{mm}^3$ . On the other hand, in early stage ferritin level will increase and low lymphocyte count i.e. Lymphopenia may occur as a most common findings. Imaging CT chest can show ground glass opacification i.e. Consolidation and bilateral peripheral involvement esp. lower lobe. All this imaging can be found even before onset of symptoms but not specific for COVID-19.

#### 7. PREVENTION MEASURE

Till date, no specific antiviral treatment has been confirmed to be effective against COVID-19. But if taken some preventive measure, then it can help to stop the spreading of the disease because prevention is better than cure. Infection prevention guidance for COVID-19 is based upon guidance previously developed for MERS and SARS as well as interim guidelines provided by the WHO and CDC [9]. There is no special vaccine for this yet. Only supportive therapy is the treatment strategy followed by health professionals. Supportive therapy includes administration of antipyretic and analgesic, maintenance of hydration, mechanical ventilation as respiratory support and uses of antibiotic in bacterial infections [10]. Isolation of confirmed or suspected cases with mild illness at home is recommended for prevention. The suspected person should be asked to wear a simple surgical mask. Healthcare workers have more risk to be contaminated by COVID-19. For healthcare workers should be provided with fit tested N95 mask and protective suits and goggles. Patient room will be decontaminated by using disinfectant like sodium hypochlorite. It is a highly spreading and contagious disease so for general public also must aware and they should be asked to avoid crowded areas and postpone

non-essential travel. They should be asked to maintain good hygienic condition and practice hand washing frequently every 15-20 min. During coughing and sneezing they should have use handkerchief and tissues. If anyone has any respiratory syndrome they should have use mask.

## 8. TREATMENT

No antiviral drug or vaccine has been confirmed yet but in some study researcher had given some treatment which will have some amount of effectiveness. From report by Li-sheng Wang *et al.*, we found that in Antiviral western medicine treatment Holshue *et al.* for the first time reported that treatment of a patient with COVID-19 used remdesivir and achieved good results [11]. Then, Xiao *et al.* findings reveal that remdesivir effectively in the control of 2019-nCoV infection in vitro. Meanwhile, also found that chloroquine has an immune-modulating activity and could effectively inhibit in this virus in vitro [11]. Clinical controlled trials have shown that Chloroquine was proved to be effective in the treatment of patients with COVID-19 [11]. In Immunoenhancement therapy synthetic recombinant interferon  $\alpha$  has proven to be effective in treatment of SARS patients in clinic trials [11]. Pulmonary X-ray abnormal remission time was reduced by 50% in the interferon-treated group compared with the glucocorticoid-treated group alone. Interferon was also found to be an effective inhibitor of MERS-CoV replication [11]. Those findings suggested that interferon could be used in the treatment of COVID-19. Convalescent plasma therapy also has some effectiveness against the disease. In a retrospective analysis, convalescent plasma therapy is more effective than severe doses of hormonal shock in patients with severe SARS, reducing mortality and shortening hospital stays [11]. A prospective cohort study by Hung and colleagues showed that for patients with pandemic H1N1 influenza virus infection in 2009, the relative risk of death was significantly lower in patients treated with convalescent plasma [11]. Moreover, from the perspective of immunology, most of the patients recovered from COVID-19 would produce specific

antibodies against the SARS-CoV-2, and their serum could be used to prevent re-infection. At the same time, antibodies can limit the virus reproduction in the acute phase of infection and help clear the virus, which is conducive to the rapid recovery of the disease [11].

## 9. CONCLUSION

Now COVID-19 is most serious contagious disease which affects the economic, medical and public health infrastructure of world. Till date no vaccine is originated to cure the disease. But researchers have been studying to develop a new vaccine and fight against COVID-19. Henceforth preventive measures will be help to stop the spreading of the disease.

## 10. REFERENCES

1. Sastry SA, Bhat KS. *Jaypee Brothers Medical Publishers Ltd.*, 2016.
2. Brooks FG, Carroll CK, Butel SJ, Morse AS, Meitzner AT. *McGraw-Hill*, 1954; 26<sup>th</sup> edition.
3. Kanan S, Ali P, Sheeza A, Hemlatha K. *European Review for Medical and Pharmacological Sciences*, 2020; **24**:2006-2011.
4. Ahmet RS, Aysegul E, Pelin MA, *et al.* *EJMO*, 2020; **4(1)**:1-7.
5. World Health Organization. Situation reports. Available at: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports/>. Accessed 4<sup>th</sup> April 2020.
6. AL-Gheethi A, Lyroni K, Aznaourova M, Tseliou M, *et al.* *Oncotarget*, 2017; **8(6)**:9053-9066.
7. Singhal T. *The Indian Journal of Pediatrics*, 2020; **87(4)**:281-286.
8. Adhikari SP, Meng S, Wu Y, Mao Y, *et al.* *Infectious Diseases of Poverty*, 2020; **9(29)**:1-12.
9. Yee J, Unger L, Zadravec F *et al.* *JACEP Open*, 2020; 1-7.
10. Kumar D, Malviya R, Sharma PK. *EJMO*, 2020; **4(1)**:8-25.
11. Wang SL, Wang Y, Ye D, Liu Q. *International Journal of Antimicrobial Agents*, 2020; **55(6)**:1-7.