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COVID-19, A PANDEMIC VIRAL PNEUMONIA IS A GLOBAL DISASTER IN 2020

SHYAM GUPTA[1*]

[1]Department of Zoology, R. B. S. College, Agra-282002, India.

AUTHOR'S CONTRIBUTION

The sole author designed, analysed, interpreted and prepared the manuscript.

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Mini-review Article

ABSTRACT

There was a significant lack of knowledge about pathology, transmission method, epidemiology and management of the novel coronavirus (severe acute respiratory syndrome coronavirus 2 or SARS-CoV-2) pneumonia or coronavirus disease 2019 (COVID-19). Comparison of the genome sequences of SARS-CoV-2, SARS-CoV and Middle East Respiratory Syndrome coronavirus (MERS-CoV) showed that SARS-CoV-2 had some different sequence. Major symptoms showed in COVID-19 were like severe pneumonia disease such as fever, cough and respiratory problems that were similar symptoms to SARSCoV. The aim of this study was to have a preliminary concepts about the taxonomy, morphology and genome of its pathogen. This study was also focused to find the ways of management, treatment, as well as prevention of COVID-19 or Global disaster in 2020. Isolation of cases, home quarantine, hygienic habits and social distancing were recommended to check human to human transmission. Antivirals drugs, anticoagulant therapy, use of serum of recovered persons from this disease and development of vaccine were under investigation.

Keywords: COVID-19; viral pneumonia; SARS-CoV-2; social distancing; serum; lockdown.

1. INTRODUCTION

Viral diseases represent a serious issue to public health. In the last twenty years, several viral epidemics such as the severe acute respiratory syndrome coronavirus (SARS-CoV) in 2002, and H1N1 influenza in 2009, have been recorded. Most recently, the Middle East respiratory syndrome coronavirus (MERS-CoV) was first identified in Saudi Arabia in 2012. MERS-CoV that began in Saudi Arabia and has approximately more than 2,400 cases and about 800 deaths and still causes sporadic cases [1].

In December 2019, an outbreak of apparently viral pneumonia of unknown pathogen emerged in the city of Wuhan, in the Chinese province of Hubei. On January 2020, the Chinese health authorities and the World Health Organization (WHO) officially announced the discovery of a novel coronavirus (first named 2019-nCoV, then officially SARS-CoV2, which was different from the viruses SARS-CoV. This new virus was the pathogen responsible for this infectious respiratory disease called "coronavirus disease 2019 (COVID-19)". World health organization (WHO) declared COVID-19 a pandemic [2].

Due to a significant lack of knowledge about pathology, transmission method, epidemiology and management, the study was enlightened. The aim of this mini review study was to have a preliminary idea about the taxonomy, morphology, and genome of pathogen of this disease as well as the ways of

**Corresponding author: Email: drsgrbsagra@rediffmail.com;*

management, treatment, and prevention of COVID-19, Global disaster in 2020.

2. TAXONOMY, MORPHOLOGY AND GENOME

2019-nCoV (SARS-CoV-2 officially named) belonged to subgenus Sarbecovirus of the genus Betacorona virus of the family coronaviridae [2,3]. Viruses of the family Coronaviridae had a single strand, positive-sense RNA genome ranging from 26 to 32 kb in length. Chan et al. [4] have proven that the genome of the new Human CoV that was isolated from a cluster-patient with atypical pneumonia after visiting Wuhan, had 89% nucleotide identity with bat SARS-like-CoVZXC21 and 82% with that of human SARS-CoV [4]. For this reason, the new virus was called SARS-CoV-2. Its single-stranded RNA genome had 29891 nucleotides, encoding for 9860 amino acids [5].

Morphologically COVID-19 Coronaviruses were enveloped, pleomorphic or spherical particles, 150 to 160 nm in size. It had capsid, matrix, and S-protein with a crown-like appearance under an electron microscope (coronam was the Latin term for crown) due to the presence of spike glycoproteins on the envelope [6,7,8] (Fig. 1).

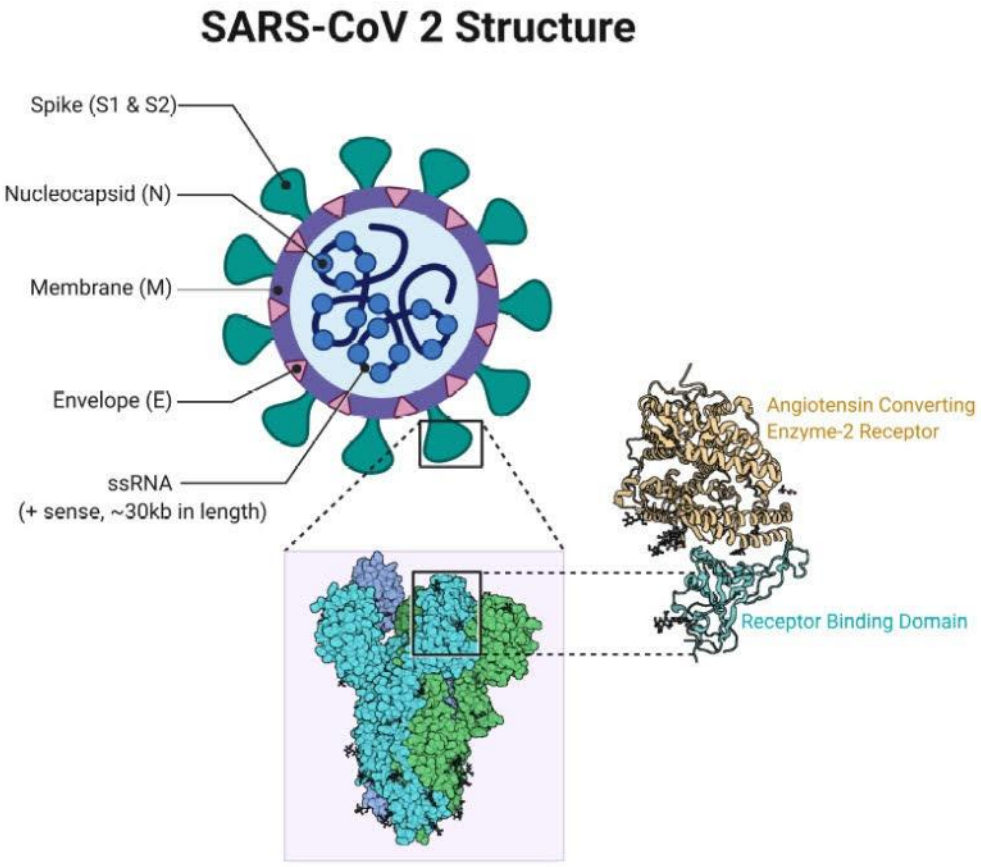

Fig. 1. Structure of SARS CoV2 (as download from ncbi.nlm.nih.gov web site)

3. EPIDEMIOLOGY

Primary examinations revealed some environmental specimens were positive for COVID-19 in Huanan Seafood Market, Wuhan [9]. Although the market place was deemed positive for COVID-19 but no specific association with an animal was confirmed yet. This indicated that human to human transmission of COVID-19 was highly likely occurred with close contact. The transmission primarily occurred when an infected person sneezes and through the respiratory droplets produced just as the spread of influenza and other respiratory pathogens. These droplets can settle in the mouth or nasal mucosa and lungs of people with inhaled air [10,11].

Data provided by the WHO Health Emergency Novel Coronavirus (COVID-19) Situation Dashboard (March 20, report- 70) 693224 confirmed cases, 33106 deaths worldwide since the epidemic. 4.77% cases have been fatal. In India 1071 confirmed cases and 29 deaths (2.70%) reported. It indicates that COVID-19 is spreading globally in a rapid manner [12].

COVID-19 and SARS-CoV belonged to the same beta coronavirus Subgroup but similarity at genome level was only 70% and the novel group has been found to show genetic differences from SARS-CoV [13]. Currently large-scale travel traffic has also created favorable conditions for the spread of this difficult-to-control disease [14].

4. PREVENTION, TREATMENT AND MANAGEMENT

Secretions from nasal chamber mucosa or sputum from suspected patients are used as samples that are subjected to specific serological tests such as enzyme linked immunosorbent assay (ELISA) and Real Time-Polymerase Chain Reaction (PCR) for detection of COVID-19 specific genes or their products or antibodies [15].

Early recognition of patients with COVID 19 is important. For Infection prevention guidelines by WHO should be followed such as washing hands frequently with soap and water, use of alcohol based hand sanitizer, cover face with mask like N95, safe waste management, social distancing and home quarantine etc. [16,17,18].

There was no definite treatment or vaccine of COVID-19 has been developed updated by 06. 04. 2020. Few methods for treatment were under investigation like antiviral drugs eg ribavirin, antiviral therapy with interferon, anticoagulant therapy with heparin [19,20,21].

SARS-CoV2 affects lungs and produces severe respiratory problems. To control these problems use of serum of recovered persons from COVID-19 can be helpful. The efforts of development of vaccine have been started and animal trial was under investigation [22,23,24,25]. Antimalarial drug hydroxy chloroquine was used in treatment and found it may helpful [26].

5. CONCLUSION

COVID-19 or viral pandemic from China has the Symptoms like severe pneumonia and its human to human transmission is very high compared to SARS-CoV and MERS-CoV. The prevention methods such as isolation or quarantine of suspected cases, use of face mask, washing hands and use of hand sanitizer etc are advised by WHO. To check rapid transmission of infection countries had to lockdown in world therefore socio-economic life of human population was affected adversely by COVID-19 [27]. However pollution level went down in cities during lockdown as showed in Agra city on 14. 03. 2020 (date before starting lockdown) the average air quality index (AQI) was 249 but on 04. 04. 2020 (date during lockdown period) the average AQI was only 66 [28]. Meanwhile antiviral drugs, interferon, anticoagulant therapy, antimalarial drug and serum therapy were examined to control COVID-19. Development of vaccine and their animal trials has been started. In future aspects for handling these types of epidemics by another new strain of pathogen medical facilities should be strengthened of countries.

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COMPETING INTERESTS

Author has declared that no competing interests exist.

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