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ORIGIN, PREVENTIVE MEASURES AND VACCINE OF COVID-19: A REVIEW

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ABSTRACT

COVID-19 is a newer and serious viral infection causing agent which is contagious. According to the W.H.O., the first known case was found in Hubai Province, Wuhan City in China. In India the first known positive case was reported in Kerala. Till date, total 62,662,181 cases are reported worldwide. It spreads very rapidly with symptoms like common cold, fever, breathing difficulty etc. Many countries have given their own guidelines to prevent or control this virus. Now, almost every country has launched their vaccine and started vaccination too. Covaxin is India's native COVID-19 immunization Bharat Biotech is created in a joint effort with the Indian Council of Medical Research (ICMR) - National Institute of Virology (NIV). This native, inactivated immunization is created and produced in Bharat Biotech's BSL-3 (Bio-Safety Level 3) high regulation office. Few serious side effects have been reported in some of the individuals but most of persons found normal and healthy.

KEYWORDS: Corona virus, Influenza, W.H.O., COVID-19.

INTRODUCTION

Coronavirus belongs to a large family of positive-sense, single-stranded RNA viruses belonging to Nidovirales order. The order belongs to the Roniviridae, Arteriviridae and Coronaviridae families. Coronaviruses cause a variety of diseases in cows, birds and also in humans. Coronavirus is subdivided into alpha, beta, gamma, and delta COVs (Fehr et al. 2015). The length of viral genome is 26 to 32 kbp (Lu et al. 2020). According to the World Health Organization (WHO), viral diseases continue to form a serious issue to public health. The Middle East respiratory syndrome coronavirus (MERS-CoV) was reported in Saudi Arabia in 2012 (Cascella et al. 2020). Deep studies and several lab investigations suggested that a new strain of COV (Chen et al. 2020). Scientists named the new virus as SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus- 2).

Coronaviruses are the member of a large RNA virus's family, Coronaviridae, which targets diverse animal species. They are known to cause the serious diseases of the respiratory, hepatic, nervous system, and gastrointestinal systems in humans. Many microbiological and microscopic studies have shown a crown-like appearance on the outer surface of virus due to the presence of spike glycoproteins.

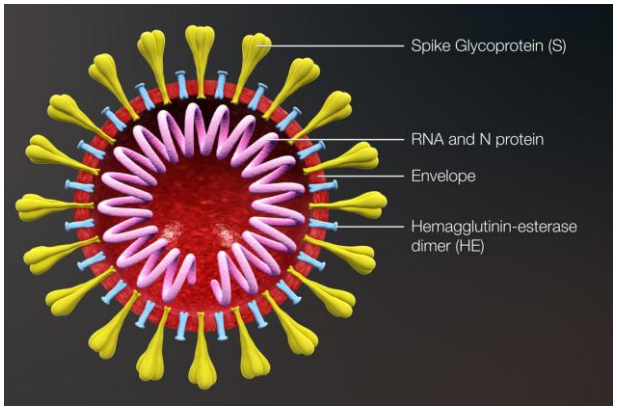

Fig. 1: Structure of Coronavirus.

Common human CoVs: HCoV-OC43, and HCoV-HKU1 (betaCoVs of the A lineage); HCoV-229E, and HCoV-NL63 (alphaCoVs). The common symptoms are colds and self-limiting upper respiratory infections in immunocompetent individuals. In immuno-compromised persons and the elderly, lower respiratory tract infections can cause a serious problem.

WHO Guidelines for general population to protect in COVID 19

- Clean your hands before you put your mask on, as well as before and after you take it off, and after you touch it at any time.

- Make sure it covers your nose, mouth and chin.
- When you take off a mask, store it in a clean plastic bag, and every day either wash it if it's a fabric mask, or dispose of a medical mask in a trash bin.
- Don't use masks with valves.

Prevention & Precaution of COVID-19

According to W.H.O. and local heath authority have been given the latest information on the COVID-19 outbreak 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 mainly self-recover it, but its infection can be more severe for other individuals who have any complications for their body (WHO Coronavirus disease, 2019).

The following points must be taken into consideration-

- 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 contains 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 or mouth So, avoid touching these organs with unwashed hands. Because from there, the virus can enter the body and may cause persons to sick.
- Maintain social distancing (maintain at least 1 metre or 3 feet distance between yourself and anyone) and avoid close contact with people who are sick (who is coughing or sneezing). When infected individuals cough or sneeze, they spray small droplets from their nose or mouth which may contain COVID-19 virus. The person can breathe in these droplets.
- Avoid large events and mass gatherings.

Management of COVID-19

Till date there is no specific antiviral treatment available for COVID-19 patients, and no vaccine is currently available. The available treatment is symptomatic, and oxygen therapy (ventilator) represents the major treatment intervention for patients with severe infection. Mechanical ventilation may be necessary in cases of respiratory failure refractory to oxygen therapy, whereas hemodynamic support is essential for managing septic shock. Some research studies claimed that ribavirin and interferon alpha have offered positive effect in early stage (Chan et al. 2013; Al-Tawfiq et al. 2014).

Protective Mechanical Ventilation

Heat and moisture ex changer (HME) must be positioned should between the mask and the circuit of the fan or between the mask and the ventilation balloon. Mechanical ventilation should be with lower tidal volumes (4 to 6 ml/kg predicted body weight, PBW) and lower inspiratory pressures, reaching a plateau pressure (Pplat) < 28 to 30 cm H2O. Finally, the use of paralytics is not recommended unless PaO2/FiO2 < 150 mmHg. The prone ventilation for > 12 hours per day, and the use of a conservative fluid management strategy for ARDS patients without tissue hypoperfusion (strong recommendation) are emphasized (Cascella et al. 2020).

Non-invasive ventilation

The expert panels suggest that non-invasive ventilation (NIV) uses may be considered at non-severe forms of respiratory failure. The good interface fitting systems used for NIV therefore the dispersion of exhaled air is not easy in this process. However, if the scenario does not improve or even worsen within a short period of time (1–2 hours) the mechanical ventilation must be preferred (Hui et.al. 2019).

Vaccine (COVAXIN)

Covaxin is India's native COVID-19 immunization Bharat Biotech is created in a joint effort with the Indian Council of Medical Research (ICMR) - National Institute of Virology (NIV). This native, inactivated immunization is created and produced in Bharat Biotech's BSL-3 (Bio-Safety Level 3) high regulation office. The immunization got endorsement from Drug Controller General of India (DCGI) for Phase I and II Human Clinical Trials and an Adaptive, Seamless Phase I, Followed by Phase II Randomized, Double visually impaired, Multicentre Study to Evaluate the Safety, Reactogenicity, Tolerability and Immunogenicity of the Whole-Virion Inactivated SARS-CoV-2 Vaccine (BBV152) (ICMR, 2020).

Other therapies

Among many other therapeutic strategies, systemic corticosteroids for the treatment of viral pneumonia or acute respiratory distress syndrome (ARDS) are not prescribed treatment. Therefore, unselective or unsuitable administration of antibiotics should be avoided. Although there is no antiviral treatments have been approved, several approaches have been proposed such as lopinavir/ritonavir (400/100 mg every 12 hours), chloroquine (500 mg every 12 hours), and hydroxychloroquine (200 mg every 12 hours). Alpha-interferon (e.g., 5 million units by aerosol inhalation twice per day) is also used as per some government guidelines (Gordon et al. 2020). Many pre-clinical studies have suggested that remdesivir (an inhibitor of RNA polymerase with in vitro activity against multiple RNA viruses, including Ebola) effective for both preventive therapy of HCoVs infections. In Italy, a great investigation led by the Istituto Nazionale Tumori, Fondazione Pascale di Napoli is focused on the use of tolicizumab. It is a humanized IgG1 monoclonal antibody, directed against the IL-6 receptor and commonly used in the treatment of rheumatoid arthritis (De et al. 2020).

CONCLUSION

This review concludes that Covid-19 has been immersed from the Wuhan, China. It has distorted the millions lives and wealth worldwide. Various precautionary methods and protocols are issued by world health organization and different regulatory bodies to counter the deadly impacts of this Covid-19. It also focuses on the ways of management.

Recently, India and almost every country has launched its Covid-19 vaccine and vaccination started too. Few serious side effects have been reported in some of the individuals but most of persons found normal and healthy.

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