



AN OVER LOOK ON CORONA VIRUS

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Abstract:-

SARS- CoV-2 is a new virus responsible for an outbreak of respiratory illness known as COVID-19, this epidemic has spread to several countries of the world. The world Health Organization has declared it a public Health Emergency of International concern. This paper is an attempt to understand about history, structure, taxonomy, origin, transmission pattern, symptoms, prevention and control of Coronavirus.

Key Words- Coronavirus, COVID-19, transmission, infection.

History of Corona

The history of human coronaviruses began in 1965 when Tyrrell and Bynoe¹³ found that they could passage a virus named B814. It was found in human embryonic tracheal organ cultures obtained from tract of an adult with a common cold. The presence of an infectious agent was demonstrated by inoculating the medium from these cultures intranasally in human volunteers, colds were produced in a significant proportion of subjects, but Tyrrell and Bynoe were unable to grow the agent in tissue culture at that time.

Epidemiologic and volunteer inoculation studies found that respiratory coronavirus were associated with a variety of respiratory illnesses, however, their pathogenicity was considered to be low^{4,9}. The predominant illness associated with infections was an upper respiratory infections with occasional cases of pneumonia in infants and young adults. These viruses were also able to produce asthma exacerbations in children as well as chronic bronchitis in adults and the elderly¹⁰.

While research was proceeding to explore the pathogenicity and epidemiology of the human coronaviruses, the number and importance of animal coronaviruses were growing rapidly. Human and animal coronaviruses were segregated into 3 broad groups based on their antigenic and genetic makeup. Group I contained virus 229E and other viruses, Group II contained viruses OC43 and Group III was made up of a avain infections bronchitis virus and a number of related avain viruses⁶.

Coronavirus Genome and Structure

Coronavirus are medium – sized RNA viruses with a very characteristic appearance in electron micrographs of negatively stained preparations. The nucleic acid is about 30kb long ,positive in sense ,single stranded and polyadenylated.

The RNA is the largest known viral RNA and codes for a large polyprotein. This polyprotein is cleaved by viral-encoded proteases to form the following : an RNA- dependent RNA polymerase and an ATPase helicase, a surface hemagglutinin-esterase protein present on OC43 and several others group II coronavirus, the large surface glycoprotein (S protein) that forms the petal-shaped surface projections, a small envelope protein (E protein) , a membrane glycoprotein (M protein) and a nucleocapsid protein(N protein) that forms a complex with the RNA. The coding functions of several other ORFs are not clear. All coronavirus develop in the cytoplasm of infected cells. budding into cytoplasmic reticulum. These vesicles are either extruded or released from the cell within the same time frame and then the cell is destroyed.

Taxonomy

Coronaviruses are toroviruses are two virus genera within the virus family coronaviridae, order Nidovirales. Coronaviruses are well established pathogens of humans and animals. Coronaviruses are classified into three groups, initially based on antigenic relationships of the spike (S), membrane (M) and nucleocapsid (N), protein and now re-infrcd by viral genetic phylogeny.

Theories of SARS-CoV-2 Origins:-

SARS-COV-2 is the seventh coronavirus known to infect humans; SARS-CoV, MERS-CoV and SARS-CoV can cause severe disease where as HKU1, NL63, OC43 and 229E are associated with mild symptoms². It is improbable that SARS-CoV-2 emerged through laboratory manipulation of a related SARS-CoV- like coronavirus. The genetic data irrefutably show that SARS-CoV-2 is not derived from any previously used virus backbone¹.

Instead two scenarios that can possibly explain the origin of SARS-CoV-2

1. Natural selection in an animal host before zoonotic transfer and
2. Natural selection in humans following zoonotic transfer.

Transmission pattern

Many domestic and wild animals, including camels, cats and bats may serve as hosts for coronaviruses¹². It is considered that, generally animal coronaviruses do not spread among humans³. However, there are exceptions, such as SARS and MERS, which are mainly spread through close contact with infected people via respiratory droplets from infected people via respiratory droplets from cough or sneezing. With regard to COVID-19 infection was taken as an human – to- human transmission^{5,7,14}. Human-to-human transmission occurred through droplets, contact and fomites¹⁶.

Respiratory infections can be transmitted through droplets of different sizes, when the droplets particles are > 5-10µm in diameter they are referred to as respiratory droplets and when then are < 5µm in diameter, they are referred to as droplet nuclei. According to current evidence, COVID-19 virus is primarily transmitted between people through respiratory droplets and contact routes⁷.

Droplet transmission occurs when a person is in close contact (within 1m) with some one who has respiratory symptoms e.g. coughing or sneezing and is therefore at risk of having his/her mucosae or conjunctiva exposed to potentially infective respiratory droplets.

Transmission may also occur by direct contact with infected people and indirect contact with surfaces in the immediate environment or with objects used by the infected person¹⁵.

Prevention

As with other respiratory infections like the flu or the common cold, public health measures are critical to slow the spread of illness. Public health measures are everyday preventive actions that include :

- Staying home when sick.
- Covering mouth and nose with flexed elbow or tissue when coughing or sneezing.
- Washing hands often with soap and waste.
- Cleaning frequently touched surfaces and objects¹⁷
- Avoid touching your eyes, nose or mouth with unwashed hands.
- Avoid close contact with people who are sick
- Use of personal protective equipment (PPE) according to risk.

Treatment

Possible vaccines and some specific drug treatment are under investigation. To date, there is no vaccine and no specific antiviral medicine to prevent or treat COVID-19.

However, those affected should receive care to relieve symptoms. People with serious illness should be hospitalized.

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