Corona Virus

Virology: It is a group of viruses related to the family: Coronaviridae. It is of the genus: Alphacorona virus, betacoronavirus, gamacoronavirus and Deltacoronavirus

History: Animal corona viruses it infect cattales, cats and birds where it cause acute gastroentritis in them. Then it genetically mutate to:

1- Human coron viruses: sever acute respiratory syndrome (SARS-CoV) .
2- 2- middle east respiratory syndrome (MERS-CoV)
3- Now new virus noval corona virus 2019-2020 is a new strain (WN-CoV 19) and then named COVID-19 virus

Structure of corona virus

Corona Latin Word mean cork (or crown) so it got its name. Single stranded RNA envelope virus surrounded by bilipd layer on its surface glycoprotein called (GPS) antigen which is responsible for attachment for mucus membrane cell on the host whether animal or human (It got attachment through its glycoprotein the spikes) also it has small spike called hemmaglutinin esterase (HE antigen) with M- protein antigen called membrane protein M inside envelope membrane with core of RNA and nucleoprotein

Pathobiology

The virus attach to respiratory cells in the nose, pharynx, larynx or lungs the glycoprotein S interact with these cells make effusion of the membrane then entrance of core nucleus to inside respiratory cells where it use the respiratory cells organs to produce more viruses the it liberated to infect another cells it it reach lungs and lead to acute respiratory failure it may cause sepsis syndrome with shock and multi-organs failure and may lead to death.

Mode of transmission

Virus is transmitted by air droplets. All are transmitted to Human by coughing infection about 1 meter, sneezing infection occur about 3 meters. If virus contaminate objects and then contaminate hands, objects, infected materials then contaminated hands Contact mouth, nose and eyes infection might settle. Rarely by feces.

Clinical Features

Incubation period of COVID -19 is 5 days (2-14 days)

Variable symptoms from asymptomatic patients, runny nose , coryza, laryngotracheobronchitis, pneumonitis, pneumonia acute respiratory distress syndrome may need assisted ventilation, septic shock and multi-organ failure. Mild symptoms 81%, moderate symptoms 16 %, sever symptoms 3.8 % and life threatening 0.2 %

Risk factors for sever to life threatening diseases are old age, smokers, patients with chronic lung diseases, immune-compromised patients.

Investigations

1- Lymphopenia, leucopenia, thrombocytopenia and elevated LDH associated with other viruses especially respiratory syncytial virus where it assist corona virus for infection

2- PCR viral load where the sensitivity is higher from lower respiratory secretions than upper respiratory secretions. Or in blood ,urine and feceses

3- Virus up to one month after infection may be detected in human

4- Radiollogical investigations by chest x-ray shows peripheral pneumonia start peripherally and extend centrally and generally till end with acute respiratory syndrome (ARDS) ALL these features is very clear by chest ct-scan.

Management

1- NO SPECIFIC TREATMENT AVAILABLE.

2- Supportive therapy

3- Isolation capability of the patients and attached people.

4- Health care awareness always significant infection occur among them at outbreak or epidemic

Prevention

1- Education about way of transmission like coughing ,sneezing and hand washing .

2- NO vaccination available

3- Sophisticated health care worker protection

4- Patients discharged from hospital only when the virus is free of patients

5- Early recognition of animal outbreak or epidemic to control it to protect human

Prognosis: Mortality rate 35% for MERS, 10% for SARS and COVID -19 still under study