Corona Virus (Covid-19) In India: Current Scenario, a Review

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Abstract: Corona viruses are a group of related RNA viruses that cause diseases in mammals and birds. In humans, these viruses cause respiratory tract infections that can range from mild to lethal. Corona virus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome Corona virus 2 (SARS-CoV-2) began in Wuhan China in December 2019. In December 2019, several patients from Wuhan, China were admitted to hospitals with symptoms of pneumonia. As the number of patients with similar symptoms started to rise, the causative agent was eventually isolated from samples. As of May 17, 2020 there have been around 4,750,616 reported cases of Corona virus disease 2019 (COVID-19) and 313,805 reported deaths to date. In India 91,449 COVID-2019 cases are reported and 2,896 reported deaths to date (17/05/2020). COVID-19 is a challenges to the human civilization, represents greatest global public health crisis.

Keywords: COVID-19, virus, pneumonia, disease

INTRODUCTION:
Corona viruses are a group of related RNA viruses that cause diseases in mammals and birds. In humans, these viruses cause respiratory tract infections that can range from mild to lethal. Mild illnesses include some cases of the common cold, while more lethal varieties can cause SARS, MERS, and COVID-19. Symptoms in other species vary: in chickens, they cause an upper respiratory tract disease, while in cows and pigs they cause diarrhoea.

Corona virus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome Corona virus 2 (SARS-CoV-2) began in Wuhan China in December 2019. In December 2019, several patients from Wuhan, China were admitted to hospitals with symptoms of pneumonia. As the number of patients with similar symptoms started to rise, the causative agent was eventually isolated from samples. As of May 17, 2020 there have been around 4,750,616 reported cases of Corona virus disease 2019 (COVID-19) and 313,805 reported deaths to date. In India 91,449 COVID-2019 cases are reported and 2,896 reported deaths to date (17/05/2020).

HISTORY:
Corona viruses were first discovered in the 1930s when an acute respiratory infection of domesticated chickens was shown to be caused by infectious bronchitis virus (IBV). Arthur Schalk and M.C. Hawn described in 1931 a new respiratory infection of chickens in North Dakota. The infection of new-born chicks was characterized by gasping and listlessness. The chicks’ mortality rate was 40–90%. In the 1940s, two more animal Corona viruses, mouse hepatitis virus (MHV) and transmissible gastroenteritis virus (TGEV), were isolated.

Human Corona viruses were discovered in the 1960s. They were isolated using two different methods in the United Kingdom and the United States. E.C. Kendall, Malcom Byone, and David Tyrell working at the Common Cold Unit of the British Medical Research Council in 1960 isolated from a boy a novel common cold virus B814. The virus was not able to be cultivated using standard techniques which had successfully cultivated rhino viruses, adeno viruses and other known common cold viruses. In 1965, Tyrell and Byone successfully cultivated the novel virus by serially passing it through organ culture of human embryonic trachea. The new cultivating method was introduced to the lab by Bertil Hoorn. The isolated virus when intranasally inoculated into volunteers caused a cold and was inactivated by ether. Around the same time, Dorothy Hamre and John Procknow at the University of Chicago isolated a novel cold virus 229E from medical students, which they grew in kidney tissue culture. The novel virus 229E, like the virus strain B814, when inoculated into volunteers caused a cold and was inactivated by ether.

The two novel strains B814 and 229E were subsequently imaged by electron microscopy in 1967 by Scottish virologist June Almeida at St. Thomas Hospital in London. Almeida through electron microscopy was able to show that B814 and 229E were morphologically related by their distinctive club-like spikes. Not only were they related with each other, but they were morphologically related to infectious bronchitis virus (IBV). A research group at the National Institute of Health the same year was able to isolate another member of this new group of viruses using organ culture and named the virus strain OC43 (OC for organ culture). Like B814, 229E, and IBV, the novel cold virus OC43 had distinctive club-like spikes when observed with the electron microscope.

The IBV-like novel cold viruses were soon shown to be also morphologically related to the mouse hepatitis virus. This new group of IBV-like viruses came to be known as Corona viruses after their distinctive morphological appearance. Human Corona virus 229E and human Corona virus OC43 continued to be studied in subsequent decades. The Corona virus strain B814 was lost. It is
not known which present human Corona virus it was. Other human Corona viruses have since been identified, including SARS-CoV in 2003, HCoV NL63 in 2004, HCoV HKU1 in 2005, MERS-CoV in 2012, and SARS-CoV-2 in 2019.

EPEDEMOLOGY:
All ages are susceptible to the infection. Infection is transmitted through large droplets generated during coughing and sneezing by symptomatic patients but can also occur from asymptomatic people and before onset of symptoms. Patients can be infectious for as long as they symptoms last and therefore clinical recovery. Some people may act as super spreaders, these infected droplets can spread 1–2 m and deposit on surfaces. The virus can remain viable on surfaces for days in favourable atmospheric conditions but are destroyed in less than an minute by common disinfectants like sodium hypochlorite, hydrogen peroxide etc. Infection is acquired either by inhalation of these droplets or touching surfaces contaminated by them or then touching the nose, mouth and eyes. The virus is also present in the stool and contamination of the water supply and subsequent transmission via aerosolization/ faecal oral route is also hypothesized. As per current information, trans placental transmission from pregnant women to their fetus has not been described. However, neonatal disease due to post natal transmission is described. The incubation period varies from 2 to 14 days. The incubation period has been found to be as long as 24 days in a study published on February 9.

CLINICAL PRESENTATION:
The clinical features of COVID-19 are varied, ranging from asymptomatic state to acute respiratory distress syndrome and multi organ dysfunction. The common clinical features include fever (not in all), cough, sore throat, headache, fatigue, headache, myalgia and breathlessness. Conjunctivitis has also been described. Thus, they are indistinguishable from other respiratory infections. In a subset of patients, by the end of the first week the disease can progress to pneumonia, respiratory failure and death. This progression is associated with extreme rise in inflammatory cytokines. The median time from onset of symptoms to dyspnoea was 5 days, hospitalization 7 days and acute respiratory distress syndrome (ARDS) 8 days. The need for intensive care admission was in 25–30% of affected patients Recovery started in the 2nd or 3rd wk. The median duration of hospital stay in those who recovered was 10 d. Adverse outcomes and death is more common in the elderly and those with underlying co-morbidities (50–75% of fatal cases). Individuals most vulnerable to developing severe and critical disease include those of advanced age or with significant comorbid conditions, such as cardiovascular disease, chronic obstructive pulmonary disease, and hypertension.

DIAGNOSIS
The decision to test should be based on clinical and epidemiological factors and linked to an assessment of the likelihood of infection. A suspect case is defined as one with fever, sore throat and cough who has history of travel to China or other areas of persistent local transmission or contact with patients with similar travel history or those with confirmed COVID-19 infection. However cases may be asymptomatic or even without fever. A confirmed case is a suspect case with a positive molecular test. PCR testing of asymptomatic or mildly symptomatic contacts can be considered in the assessment of individuals who have had contact with a COVID-19 case. Screening protocols should be adapted to the local situation. The case definitions are being regularly reviewed and updated as new information becomes available. Suspected cases should be screened for the virus with nucleic acid amplification tests (NAAT), such as RT-PCR.

Specific diagnosis is by specific molecular tests on respiratory samples (throat swab/ nasopharyngeal swab/ sputum/ endotracheal aspirates and bronchoalveolar lavage). Virus may also be detected in the stool and in severe cases, the blood. Commercial tests are also not available at present. 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. As the epidemic progresses, commercial tests will become available. Other laboratory investigations are usually nonspecific. The white cell count is usually normal or low. There may be lymphopenia; a lymphocyte count <1000 has been associated with severe disease. The platelet count is usually normal or mildly low. The CRP and ESR are generally elevated but procalcitonin levels are usually normal. A high procalcitonin level may indicate a bacterial co-infection. The ALT/AST, prothrombin time, creatinine, D-dimer, CPK and LDH may be elevated and high levels are associated with severe disease. The chest X-ray (CXR) usually shows bilateral infiltrates but may be normal in early disease. The CT is more sensitive and specific. CT imaging generally shows infiltrates, ground glass opacities and sub segmental consolidation. It is also abnormal in asymptomatic patients/ patients with no clinical evidence of lower respiratory tract involvement. In fact, abnormal CT scans have been used to diagnose COVID-19 in suspect cases with negative molecular diagnosis; many of these patients had positive molecular tests on repeat testing.

TREATMENT:
While several drug trials are ongoing, there is currently no proof that hydroxychloroquine or any other drug can cure or prevent COVID-19. Instead, treatment focuses on managing symptoms as the virus runs its course. Other Corona viruses like SARS and MERS are treated by managing symptoms. In some cases, experimental treatment is tested to see new effective they are. Examples of therapies used for these illnesses include:

- Antiviral or retroviral medications
- Breathing support, such as mechanical ventilation.
- Steroids to reduce lung swelling
- Blood plasma transfusions.

© May 2020 IJSDR | Volume 5, Issue 5

ISSN: 2455-2631

© May 2020 IJSDR | Volume 5, Issue 5

ISSN: 2455-2631

© May 2020 IJSDR | Volume 5, Issue 5

ISSN: 2455-2631
PREVENTION:
Since at this time there are no appropriate treatments for this infection, prevention is crucial. The CDC recommends multiple steps to prevent the transmission and risk of SARS-CoV-2. Frequent hand washing lasting at least 20 seconds by using soap and water is advised. Hand sanitizer with at least 60% alcohol can also be used as an alternative. Isolation of confirmed cases or suspected cases with mild illness at home is recommended. The ventilation at home should be good with sunlight to allow for destruction of virus. The public has been told to avoid touching mucosal surfaces such as the mouth and nose with hands that have not been washed. Anyone showing symptoms of the virus should try to seek medical help. They should also limit their exposure to other unaffected people and cover their nose and mouth when coughing and sneezing. They also advise to wear a facemask.  

CONCLUSION:
The COVID-19 is spreading across the world at an alarming rate. COVID-19 is a challenge to the human civilization, represents greatest global public health crisis. Now all the nations of the world are fighting against the disease for rescue. Not only the small counties of the world but also big and super powers of the world are effecting from this virus and became helpless, while some treatment protocols have shown some promise, there is at present no confirmed medication for cure the COVID-19 virus. With proper preventive measures like social distancing, wearing face mask, frequently hand washing technique can reduce the chance of COVID-19 contamination.

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