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Novel COVID-19- the pandemic on planet Earth- A brief insight into Transmission, Diagnosis and Treatment- A Review

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Abstract

Pandemic diseases continue to emerge as per the World health Organisation reports and there had been a continuous combat against the same for past years worldwide. These diseases might include viral or bacterial or other deadly pathogens. The current and trending outbreak which spreads equally among all countries which is becoming fatal is the novel Corona virus or COVID-19. The infection started its journey right from wuhan city, China and now has no borders to cross up to date. The symptoms are direct or indirect and various from individual. One such serious stage is "Severe Acute Respiratory disorder" a syndrome or disorder caused by our own immune system when fighting against an infection. Another fatal symptom is the Severe Acute Respiratory disorder. It is condition where our own immune systems overworks against a particular pathogenic infection and the chemical released by the same causes inflammation or damage to our own cells or tissues. Among the various causes of sepsis or tissue damage and fatal sepsis, pneumonia, viral pneumonia like COVID- 19 is more critical to go for treatment. However sepsis is not contagious, it could cause serious damage to the person through blood stream from the source of infection.

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INTRODUCTION

The COVID-19 or New Corona virus is considered as one of greatest horny to human community which had made people to pause for moment whoever it is and look back their risk at life (Li *et al.*, 2007). Fatal sepsis is a severe health problem sparked by our body's reaction to infection caused by over secretion of chemicals during the process of immunogenesis at the time of pathogenic infections (Wu *et al.*, 2020). Once an individual acquires an infection, it will affect our body. At its most severe, the body's response to infection could cause dangerously low blood pressure and struggle to breath (WHO, 2020). Fatal sepsis, causes blood poisoning and damages the blood cells severely. If the blood are infected, the person get trouble shoot in breathing, coughing and sneezing. If any person gets this total epsis they should be hospitalized, often in an ICU. Because it could spread over the people where many condition could mimic sepsis including severe allergic reaction, bleeding, heart attack, blood clot and medication.

COVID-19 is a severe acute respiratory syndrome. It the zoonotic transmission associated with wild animals. COVID-19 can transmit person to person. This infection have many symptoms, like mild upper respiratory track illness and viral pneumonia with respiratory and it may cause death with many patients.

Itiology of COVID-19, covs are RNA viruses with a crown like structure viable on electron microscope. Covs are the coronaviridae family. It can be divided into four viruses

1. *Alphacorona* virus
2. *Betacorona* virus
3. *Deltacorona* virus
4. *Gammacorona* virus

This virus may affect and cause respiratory, enteric, hepatic and hierological disease in different wild animals including bats, cats and cattle. Coronavirus were identified nearly 60 years ago; it was a severe acute respiratory syndrome. This viral surrounded by transmembrane glycoprotein. This membrane was thick and flexible. This virus contained a single stranded, 5'capped, positive strand of RNA molecule. During replication, ORFI of corona virus encodes 16 proteins that were containing only 15 proteins and the structure of the protein were visualized by X-ray crystallography or nuclear magnetic resonance (NMR). Recently the Corona virus infected cases started with patient infected pneumonia in Wuhan, China. The three dimensional structure of this corona virus or COVID-19 had been identified by X-ray crystallography or NMR , which was found to be affecting the function of respiratory system, it cause difficult in breathing. COVID 19 severe symptoms such as reploid illness had ranged from people with mild symptoms to people being severely ill and dying, fever, dry cough and shortness of breath. Pre existing conditions that were found to put the patients at higher risk, were cardiovascular diseases, diabetes, chronic respiratory disease and hypertension, otherwise healthy people develop a severe form of pneumonia after being infected by the virus.

The COVID -19 earlier called as nCOVID-19 has emerged as major challenge to people of all strata of society. The scientist, physicians, medical practioners as well researchers are toiling hard day and night with or without food, sleep or any other commitments to eradicate this new global challenging pandemic completely and save lives on planet earth. At the beginning stages of this COVID-19 outbreak, it was believed that this virus was transmitted from animal like bats to human as per the first reports. But the subsequent cases posed that this infection could be transmitted from human-human through aerosol droplets while sneezing, touching the infected person, even through materials thighs used by infected person etc. However a detailed study is required to know better about the mode of transmission of these viruses. The mechanism of infection includes severe pneumonia which could lead to vast unprecedented immune response and cytokine storm. This would lead to production of more immune chemicals that would perform reverse action and cause fatal damages like sepsis or organ dysfunction. In case of COVID-19, result leucocytes start producing more interleukins IL-6 (pro-inflammatory), that may cause inflammation that were fatal leading to septic shock or organ dysfunction. In this review we would summarize the overall ill effects of new pandemic disease outbreak caused by novel corona virus or COVID-19 in brief.

Cascella *et al.* (2020), conducted his research on features, evaluation and treatment of corona virus (COVID-19), it is a various issue to puplic health. The covs, become a powerful pathogen which may cause respiratory disease. The COVID-19 is a single strand RNA virus, which is isolated in animals. It is a pandemic disease. Covs the subfamily orthocoronavirinae of the coronaviride family divided into four. Figures 1, 2, 3 and 4 shows,

1. *Alphacorona* virus
2. *Betacorona* virus
3. *Deltacorona* virus
4. *Gammacorona* virus

The corona virus was the large family can cause respiratory infection. It may transmitted into person and spread all over the world. This COVID-19 disease directly exposure to the human, the animals to human transmission, here it was concluded that the virus could be transmitted to human to human. They also reported the data provided by the WHO that 142-320 causes confirmed in world wide. In this article, Histopathological data also obtained on the two patients data obtained from reports provided by the health policy agencies the provide information of COVID-19 may present with mild, moderate reverse illness.

Perlman and Netland (2009) in one their review studied the mechanism of COVID-19 replication and how they attach with host immune system and causes disease. Corona virus that has now been considered as greatest challenge compared to previously occurred severe acute respiratory syndrome (SARs), which occurred during 2002-2003. In the

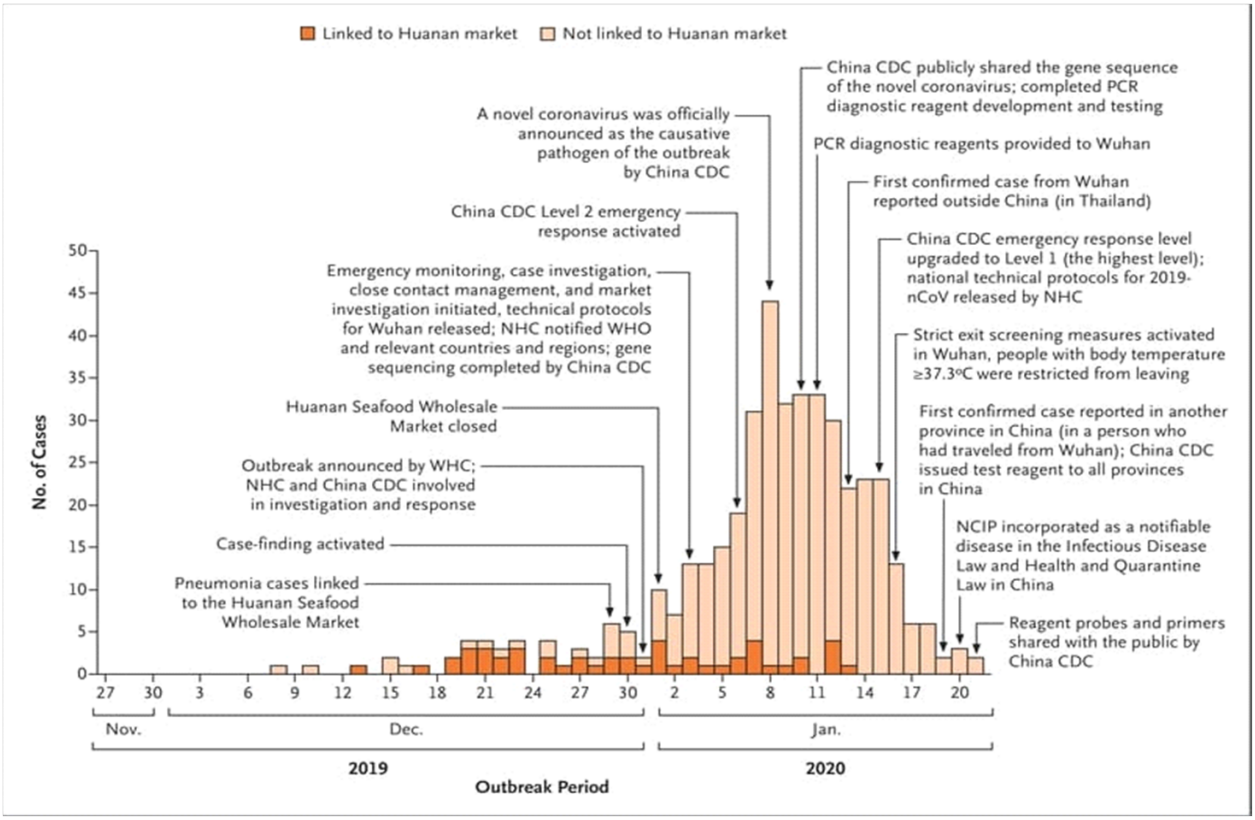

Figure 1: Statistical Data of CoronaVirus Infection 2019

COVID-19 viral membrane that contained glycoprotein. Corona virus contained a single strand RNA molecule ranges from 26-32kb. In coronavirus, open reading frames (ORFs) responsible for production of subgenomic mRNAs were found to account for about 2/3 of the genome that encoded replicable protein. These were leading to the production 16 proteins that were involved in replication of viral protein. The structures of these proteins were identified by X-ray crystallography, Nuclear Magnetic Resonance spectroscopy (NMR). The function and structure of the COVID-19 replication was studied by the author.

Chan *et al.* (2020) experimentally performed the bioinformatics analysis on a Corona Virus (COVID-19). They also characterized the novel human pathogenic Coronavirus isolated from a patient who affected by COVID-19. In his paper, he investigated the origin and history of the Corona Virus which might further be used for studying the pathogenesis and help in developing novel design for diagnostic, antiviral agents or vaccines. According to the reports of cases of pneumonia of unknown cause in Wuhan City, China World Health Organization (WHO) the information of patient infected with the COVID-19 was collected. It showed the onset of 10 number in the beginning of 2019, wit mild symptoms such as fever, dry cough, difficult in breathing. This infection was increased in due course and 41 patients were admitted in hospital at Wuhan, China. The nasal swab or blood samples of these infected persons were sequenced and compared with the complete genome sequence of (COVID-19) Virus, already available in geneBank. Then the phylogenetic tree for genome characterization was constructed using MEGAX software. They concluded that COVID-19 was of 2984 nucleotides in size that encrypted 9860 aminoacids. The study showed that the novel corona virus (ncov) or COVID-19 was a new strain that were linked with B-Betacoronavirus closely related to SARS-related corona viruses that could be common in animals like bats.

Li *et al.* (2020) in this Research reported that the initial cases of novel coronavirus - infected pneumonia patients in the Wuhan, China . They collected the data on demographic characteristic exposure history and illness of the patient. There, the author identified the mechanism of pneumonia of unknown etiology that was, “illness without a pathogen”. Epidemiologic data were collected from all infected persons, neighbours, close contacts and workers. This data form the site of infection spread or exposure from the specific market in wuhan city, China was also collected. The data where collected from the start site of exposure, history of the pathogen, timeline of the infection and close contact infor-

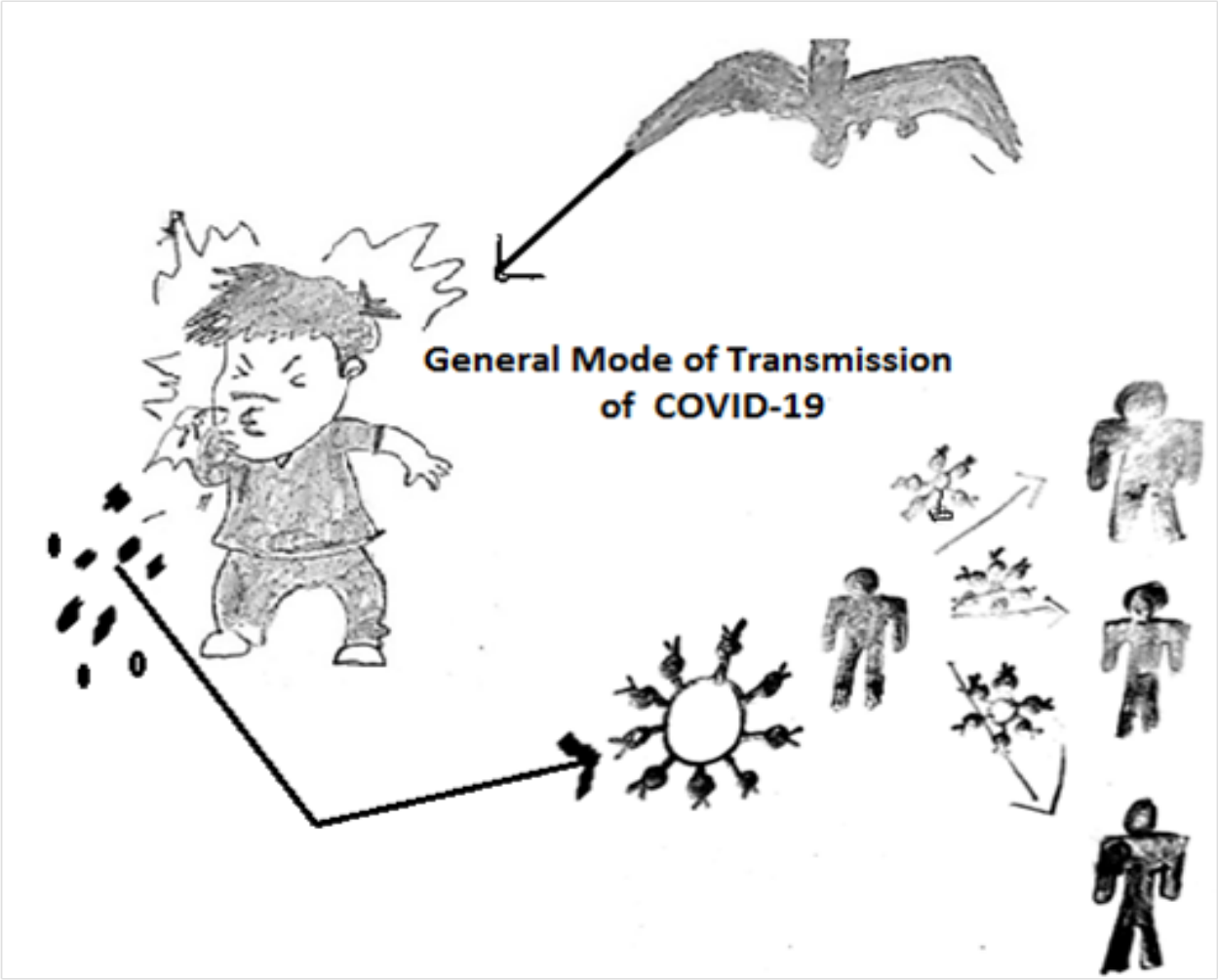

Figure 2: General routes of Transmission of COVID-19 to Humans

mation. According to WHO (World Health Organization) COVID-19 were defined as a pneumonia that could cause infection based on four criteria like fever with temperature, radiographic evidence of pneumonia, Low Blood pressure and Breath difficulties. Laboratory Testing assays based on WHO recommendations, suggested that test were analysed at biosafety level-2, where RNA from the patient was synthesised from blood sample DNA collected from the infected patient and studied by RT-PCR. After that the genome was collected and analysed by Sanger Sequencing Method. Finally the study concluded the limitation of infections with an pathogen and diagnostic, epidemiology and identification of the patients.

Stockman *et al.* (2006) in his Article, conducted the experimental protocol that might be defined the SARS (Severe Acute Respiratory Syndrome). The study was contained as part of a whole being considered the (1) Inhibition of SARS-COV viral replication and preparation of data report from human or animal cell line. (2) Uncontrolled study design and patients affected with SARS. (3) Systemic review and treatment for AIDS. They searched the literature through systematically by databases MEDLINE, EMBASE, BIOSIS and CENTRAL. In the investigation, they summarized the consequence or outcome of a systematic evaluation of the findings from published database of treatments used for SARS during the widespread occurrence of an infectious disease in a community at a particular time.

Mayer *et al.* (2016) investigated about corona virus he studied about a 27 years-old female who was affected by the Coronavirus (NL63) (HcoV-NL63). They provided report on Coronavirus brought the attention of deadly flu which caused severe acute respiratory syndrome and middle last respiratory syndrome. The 27 years old patient treated with German-Multicenter Trial for Adult All (GMALL). They observed mild mucositis during treatment therapy without other infection. In day 35, at treatment patient was found to survive high fever, leading to oxygen saturation and eventually suffered with partial pressure of oxygen (respiratory failure).

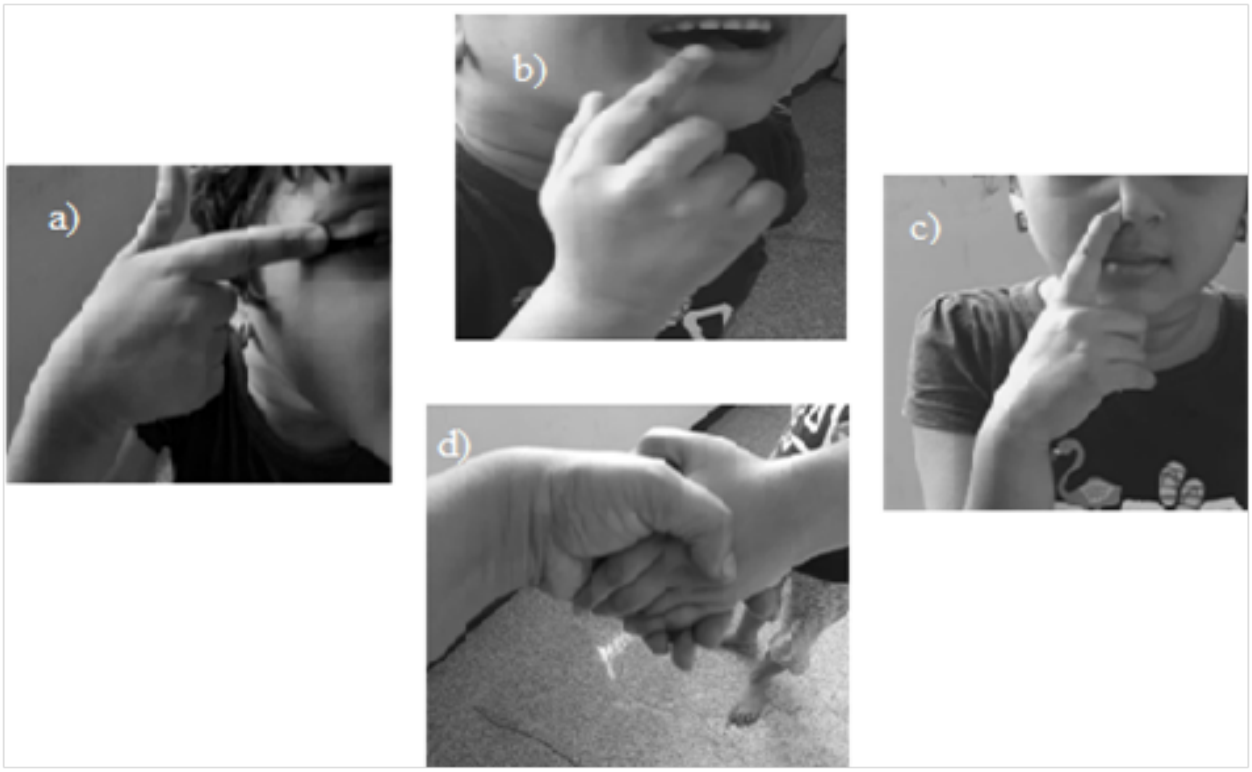

Figure 3: Things individual should avoid when infected with COVID-19, Avoid -a) Touching eyes; b) Touching mouth; c) Touching nasal parts & d) Hand Shaking

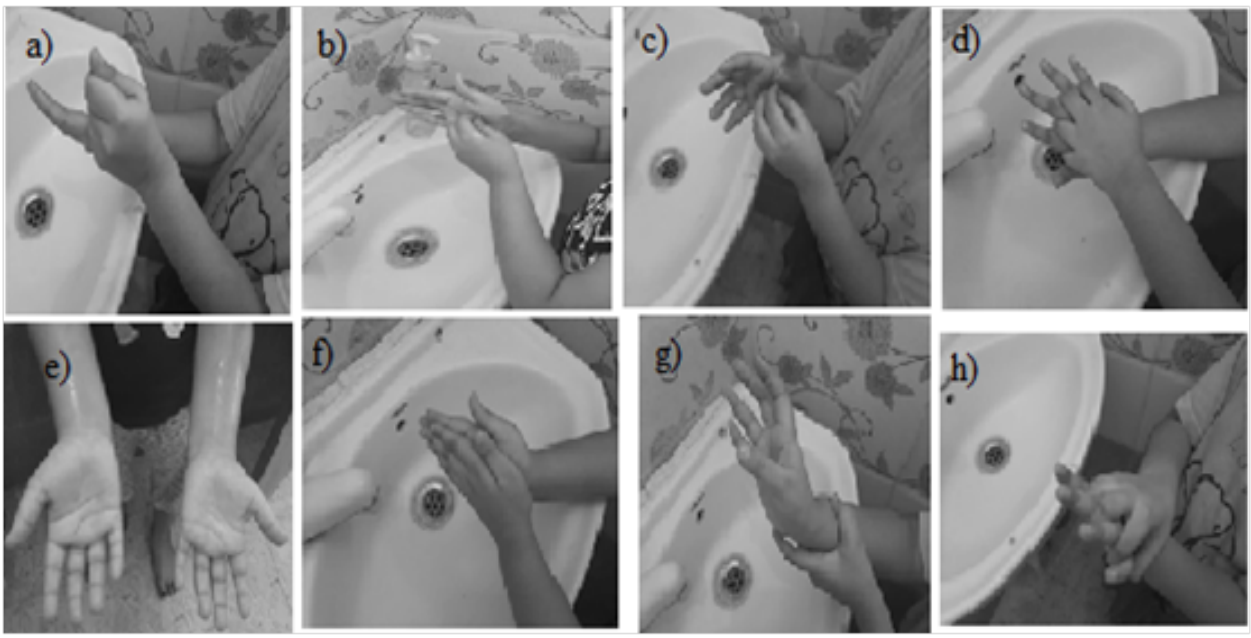

Figure 4: Proper Hand washing –A key for Prevention of COVID-19 Infection Spread

Finally CT Scan was taken for further diagnostic of severe and sudden respiratory failure. The study concluded that there were very limited literatures available for the treatment of COVID-19, no clinically approved vaccines or antiviral drugs. The study also envisaged that the screening of immunosuppresive agents would be a better option to reduce the rate of infection.

Drosten *et al.* (2003) in his research, conducted the experiment on patients affected with severe acute respiratory syndrome (SARS), which was caused by unknown infectious pathogens. They worked on random amplication procedure through polymerase chain reaction (PCR) and sequenced around 300 nucleotides from the samples isolated form COVID-19 affected patient. Many techniques and methods were used in clinical specimens from patients with severe acute respiratory syndrome. They concluded in their experiment, the novel pandemic COVID-19 might have an important role in causing the severe acute respiratory syndrome.

Poon *et al.* (2003) in his investigation conducted the Rapid Diagnosis of a Coronavirus Associated with Severe Acute Respiratory Syndrome. The study observed that the disease had spread rapidly and patients suffering from this disease responded hardly to any antimicrobial treatments. They identified that the COVID-19 infection could be cured only by increasing the antibody production in the infected person that could trigger the novel virus patients have symptoms, which were respirator in clinical diagnosis of SARS included, fever of 38^{o}C, cough or shortness of breath and respiratory failure. In this conclusion they identified a simple and rapid diagnostic test for a novel coronavirus associated with SARS.

Van Der Hoek and Ther (2007), identified and classified the human coronavirus are known to exist as human coronavirus 229E, Hcov-OC43 and Severe Acute Respiratory Syndrome (SARS) where closely related with family of coronavirus. They recognised new method of virus diagnosis. The virus was isolated from a 7 month old child. The specific virus did not replicate invitro as used in viral diagnostics. Most of diagnostic methods were found to be failed. PCR was used to amplify the nucleotides sequence and specific antibodies were raised against the virus to kill them. They identified new method called CDNA-amplified restriction fragment length polymorphism technique. In this technique the unknown virus were analysed by the VIDISCA method using molecular biology. By that method they identified new human coronavirus causing severe acute respiratory syndrome (SARS).

Hocke *et al.* (2013) in his investigation of the study included the analysis of Middle East Respiratory Syndrome (MERS) caused by Coronavirus, which was a wide spread infection and damaged the alveolar in human lungs. Four endemic Coronavirus were observed to cause mild respiratory symptoms in the patients. In invivo infection of human lung tissue detect the viral antigen was responsible for causing the Middle East respiratory syndrome. The investigation of MERS on the damage of the alveolar str

ucture was a mark of corona disease involving the severe respiratory failure. The infection experiments concluded the capability of Middle East Respiratory Syndrome corona virus to induce/ suppress the alveolar cell death was in close conjunction with acute lung injury. This research explained the sources and transmission of the coronavirus in the middle east regions.

van der Hoek *et al.* (2004), in his study reported the human SARS-corona virus NL63, they classified three necessary new human coronavirus which were not an does not a sudden increase the infection of their new type of infection. He recently identified the SARS-COV among the population, which circulating in human for a while. HCOV-HKVL and HCOV-NL63 are respiratory coronavirus, are frequently found during Lower and upper respiratory tracts infection. Overall the article, give the knowledge of four human corona virus that are circulating in the population.

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