

DIVULGING EPIDEMIOLOGY OF COVID-19

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Abstract : Patients with initial diagnosis of pneumonia and having symptoms of dry cough, dyspnea, fever and bilateral lung infiltrates on imaging admitted to hospitals in late December 2019 in Wuhan, China. These patients were found infected with a noble infectious corona virus SARS-CoV-2 (Severe acute respiratory syndrome Corona Virus) and the disease was termed as COVID-19 (Corona Virus Disease-2019). At present, COVID-19 became pandemic for the whole world as almost 184,263 people including male, female, children and old age have lost their till 23 April, 2020. In the absence of proper medicine or vaccine, prevention from the disease is the only effective means to stop transmission of disease in the community and to save lives. Transmission of disease may be symptomatic, pre-symptomatic or asymptomatic through infectious droplets, direct contact or contract with contaminated surfaces. People belongs to the age more than 60 years or with underlying serious medical conditions are at greatest risk to be get infected and lose their lives.

Keywords: Coronavirus, SARS-CoV-2, Pandemic, Symptomatic, Transmission.

1.BACKGROUND

In late December 2019, many patients who were associated to a seafood and wet animals wholesale market in Wuhan, Hubei province of China got admitted to hospitals with an initial diagnosis of pneumonia of an unknown etiology. These patients were suffering with clinical symptoms of dry cough, dyspnea, fever and bilateral lung infiltrates on imaging [1, 20]. On January 7, 2020, Chinese centre for Disease Control and Prevention (China CDC) identified the agent involved in this etiology and subsequently, named it as "Severe Acute Respiratory Syndrome Corona virus 2 (SARS-CoV-2)" and later the term given to the disease was "COVID-19" by the World Health Organization (WHO) [31].

Corona virus (CoV) belongs a family of ribonucleic acid (RNA) virus. They are called coronavirus because the virus particle exhibits a characteristics 'Corona' (crown) of spike proteins around its lipid envelop [32]. In humans, corona virus can cause illness ranging from common cold to more severe disease such as Middle East Respiratory Syndrome corona virus (MERS-CoV) and Severe Acute Respiratory Syndrome coronavirus (SARS-CoV) [3]. The MERS-CoV was first identified in Saudi Arabia in 2012 while SARS-CoV originated in China in 2002- 03 that was reported to spread in more than 20 countries. In both cases, more than 800 lives was lost. COVID-19 is the third known zoonotic corona virus disease after SARS and MERS which also belong to beta - corona virus cluster [10]. As compared to other corona virus, the SARS-CoV-2 is highly contagious and found to spread quickly worldwide. Based on the increasing number of infection of COVID-

19, WHO declared COVID-19 as a 'Public Health Emergency of International Concern' on 30 January 2020 and later as a 'Pandemic' on March 11, 2020 [33]. The WHO emergency committee has also stated that spread of the disease can be slow down by early detection, isolation, prompt treatment, and implementation of a robust system to trace contacts [34]. In present time, COVID-19 has spread globally in more than 200 countries and became pandemic. As on 23 April 2020, worldwide, total 2,639,025 covid-19 cases have been confirmed and 184,263 deaths are recorded, whereas, 722,150 cases recovered from the disease [41].

2.ORIGIN OF COVID-19

Scientists are still trying to reach on the conclusion of origin of COVID-19 and its causative virus SARS-Cov-2 [35]. On the basis of current data, it seems that SARS-CoV-2 might be initially hosted by bats, and then transmitted to human *via* pangolin [17] or other wild animals [21, 43] being sold at the Wuhan seafood market, but subsequent spread through community transfer, i.e., human-to-human transmission. However, genomic comparisons suggest that the SARS-CoV-2 virus is the result of a recombination between two different viruses [12].

3.SIGN AND SYMPTOMS

According to WHO, the most common symptoms of COVID-19 are fever, tiredness, and dry cough. Besides, few patients may have aches and pains, nasal congestion, runny nose, sore throat or diarrhea [36]. A study revealed that many patients who have infected with SARS-CoV-2 and only developed mild symptoms such as dry cough, sore throat and fever, could spontaneously resolved due to their strong immune system. However, sometime various fatal complications including organ failure, septic shock, pulmonary oedema, severe pneumonia, and Acute Respiratory Distress Syndrome might be developed in patient [9]. Studies by various scholar found that common symptoms at onset of COVID-19 illness are fever, cough, and fatigue, while other symptoms include sputum production, headache, haemoptysis, diarrhoea, dyspnoea, and lymphopenia [25, 29]. According to the study conducted by Huang et al. [13] for Wuhan, China, 98% of patients that was suffering with COVID-19 had symptom of fever in which 78% had higher than 38°C body temperature, 76% had coughs, 44% having feelings of fatigue and muscle pain, and 55% had dyspnea. It was also found that few patients developed expectoration (28%), headaches (8%), hemoptysis (5%) and diarrhea (3%). Moreover, laboratory tests revealed that 25% of infected patients had leukopenia and 63% lymphocytopenia [13].

4.TRANSMISSION

Transmission of COVID-19 virus can be explained under three heads- symptomatic, pre- symptomatic and asymptomatic transmissions.

Symptomatic transmission: When sign and symptoms compatible with COVID-19 virus infection developed in a person and disease is transmitted from him / her to another uninfected person, it is referred as symptomatic transmission. According to current evidence, COVID-19 virus is primarily transmitted from symptomatic people to others who are in close contact through respiratory droplets or by direct contact with infected person or by contact with contaminated objects and surfaces [2, 8, 13, 18, 19].

Pre-symptomatic transmission: Pre-symptomatic period also known as incubation period is the time between exposure to SARS-CoV-2 virus and onset of symptoms, which is on average 5-6 days, however can be up to 14 days. During this period an infected person can also be contagious and transmit virus to others [14, 15, 24, 26, 30, 42]. It is important to note that pre-symptomatic transmission will still require infectious droplets, direct contact or contact with contaminated surfaces for transmission of COVID-19 virus.

Asymptomatic transmission: Based on laboratory reports, some COVID-19 positive patients don't show any sign and symptoms of it. Even there is no any document or report of asymptomatic transmission but possibilities of transmission of virus by these patients cannot be ruled out [40]. Further, no airborne transmission was reported in the study of 75,465 COVID-19 cases in China [23]. Similarly, there is some evidence that COVID-19 infection may lead to intestinal infection and be present in faeces [44], but there is no any report of faecal-oral transmission to date.

5.PREVENTION

To date, no proper medicine or vaccine has been developed for the treatment of COVID-19. Therefore, in the absence of an effective treatment, only prevention is the best method to minimize the spread of COVID-19 virus in society. Studies revealed that early diagnoses, reporting, isolation, supportive treatments, timely release of epidemic information and maintenance of social orders can be adopted as strategies whereas; for individuals, protective measures, improving personal hygiene, wearing masks, adequate rest and keeping rooms well ventilated, can effectively prevent the spreading of SARS-CoV-2 infection [11]. World Health Organization and US Centers for Disease Control and Prevention (CDC) have recommended avoiding travelling to high risk areas, contact with symptomatic individuals, and consumption of meat from known COVID-19 outbreak regions. They also recommended for basic hand hygiene measures including frequent hand washing and avoid touching their face and mouth after interacting with possibly contaminated environment and also, use of PPE such as face masks should be observed. People with compromised immune should avoid public gatherings [4, 37].

6.TREATMENT

Scientists of world are endeavoring to find specific treatment for COVID-19 but till now, no medicine or vaccine has been successfully developed. At present, patients with SARS-Cov-2 infection are treated mainly

on the basis of their symptoms. Most common complications in COVID-19 patients were acute respiratory distress syndrome, followed by anemia, acute heart injuries and secondary infections. Therefore, antibiotics, antiviral therapy and systemic corticosteroids were often used for treatments. Patients with intractable hypoxemia were given invasive mechanical ventilation [13]. Paracetamol was used for fever treatment, whilst expectorants such as guaifenesin may be used for a non-productive cough [27]. Another report showed that antiviral remdesivir and chloroquine are highly effective in the treatment of SARS-CoV-2 infection [28]. There is chance of developing further bacterial and fungal infections during middle and latter stages of disease, therefore, conservative and rational antibiotic regimens, must still be followed [16].

7. PEOPLE AT GREATEST RISK

According to WHO, about 80% of people will recover from the disease without requiring special treatment [38]. However, approximately one out of every six people infected with COVID-19 will become very sick and develop breathing difficulties [39]. There are certain categories of population that are most vulnerable to increased risk of severe disease after infected from COVID-19. According to currently available information and clinical expertise, older adults and people of any age who have serious underlying medical conditions might be at higher risk for severe illness from COVID-19 [5]. Studies from China revealed that aged people, particularly those suffering with some serious underlying health conditions, are at higher risk for severe COVID-19 associated illness and death than are younger persons. Majority of cases reported in China, approximately 81% were mild; but 80% of deaths occurred among adults aged ≥ 60 years and only one death (0.1%) occurred in person aged ≤ 19 years [22]. A report from CDC, United States, as of March 16, 2020, overall 31% of cases, 45% of hospitalization, 53% of ICU admissions, and 80% of deaths associated with COVID-19 were among adults aged ≥ 65 years with highest percentage of severe outcomes among persons aged ≥ 85 years [6]. People underlying medical conditions such as, people with chronic lung disease or suffering with moderate to severe asthma, heart patients, diabetics, chronic kidney and liver disease patients, cancer and AIDS patients, smokers, liquor addicts and people with severe obesity and immune-compromised of all age groups might be at higher risk for severe illness from COVID-19 [7].

8. CONCLUSION

COVID-19, originated from Wuhan, China in late December 2019 from unknown source, has become pandemic for the world. To date, almost 184,263 deaths has been recorded due to this disease and numbers are increasing day by day. Many researches and experiments are in progress to produce effective medicine or vaccine for treatment of COVID-19 patients. At present, stopping transmission of SARS-CoV-2 by various means can only prevent people from getting infected with the virus. More attention and cares is to be taken for old age people because they are at the greatest risk of getting infected and almost 80% of people greater than age of 60 years lost their lives. People with underlying serious medical conditions are also need to be taken

care of. Being a new epidemic for the world, many more studies and research yet to be come on COVID-19 and thus, it is the limitations of this review. However, this paper is an effort to make people and society aware and to understand the pandemic disease for safe and better living.

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