

The World Invisible Murderer: Review on COVID-19

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Abstract- The present pandemic novel (corona virus) COVID-19 was first appeared in china, at the moment rate of infection and death was in valley. Subsequent days the COVID-19 is spreading all over the world and affecting peoples in large numbers. The characteristics of COVID-19 were similar with SARS-CoV, MERS-CoV, bat corona virus and found that, this belongs to Coronaviridae family and it is the seventh virus in the family causing outbreak of humans. The SARS and MERS are previously reported, but to compare this covid-19 outbreak effect was less. There is no specific medicine and treatment had discovered against COVID-19. This review was focused about the information of corona virus, clinical symptoms, incubation period, Clinical diagnosis, transmission and prevention of COVID-19 virus.

Keywords- COVID-19, Pandemic, Coronavirus, Coronaviridae, SARS-CoV, MERS-CoV

I. INTRODUCTION

The several cases of pneumonia of unfamiliar etiology were reported in Wuhan capital city of Hubei Province, China, and linked to Huanan Seafood Wholesale Market [1]. And the first patient of unknown disease was recorded on 8th December 2019. The World Health Organization confirmed the novel corona virus and the first death case were reported on 9th January 2020. The first cases of external country were witnessed on 13th January in Thailand [2]. The pathogen of current outbreak is now call COVID-19 is caused by a novel corona virus [3]. The genetic sequence possesses several dissimilarities to the virus responsible for COVID-19, tentatively named SARS-CoV-2, with roughly 79% homologies, 50% to (MERSCoV) and 96% to a bat corona virus, which is discover through whole genome sequencing and polymerase chain reaction (PCR) obtained from infected patients [4]. Previously six corona virus species are well-known to cause human disease [5]. The first four viruses are 229E, OC43, NL63, and HKU1, and are prevalent and generally cause common cold symptoms in immunocompetent persons [6]. The two other strains are Middle East Respiratory Syndrome Coronavirus (MERS-CoV) and Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV). Now COVID-19 is the seventh corona virus which was infected to humans [7]. Overall in the world 85,700 cases were identified on 29 February, 2020, now Italy has the largest outbreak of COVID-19 [8]. The World Health Organization

declared the COVID-19 outbreak a pandemic on March 11, 2020 [9]. To reduce the fast growth of cases via human-to-human transmission, the government of China suspended all vehicles, trains, and flights transportation from Wuhan on 23 January 2020. To Expecting that intervention would avoid further widespread of the disease [10].

II. CLASSIFICATION OF CORONAVIRUS

Coronavirus are enveloped, positive single-stranded large RNA viruses. Coronavirus was primarily described in 1966 by Tyrell and also by another one person, who identified the viruses from patients with common cold. They termed corona viruses (Latin: corona= crown) [11]. The Coronaviruses which belongs to *Nidovirales* order, which includes *Arteriviridae*, *Roniviridae*, and *Coronaviridae* families. The *Coronaviridae* consists of two subfamilies *Coronavirinae*, and *Torovirinae*. The *Coronavirinae* are further subdivided into four groups, α -alpha, β -beta, γ -gamma and δ -delta corona viruses [12]. The (CoVs) are classified in to 3 groups, Bovine Coronavirus (BcoV), Human Coronavirus (HCoV) and Canine respiratory Coronavirus (CRCoV) [13]. The flowing table (1) shows the classification of corona virus.

Table 1: Classification of Corona virus

Order	Family	Subfamily	Genus
<i>Nidovirales</i>	<i>Coronaviridae</i>	<i>Torovirinae</i>	Torovirus
			Baffinivirus
		<i>Coronavirinae</i>	α -CoV
			β -CoV (SARS, MERS- CoV)
			γ -CoV
			δ -CoV

III. STRUCTURE OF CORONAVIRUS

The Corona viruses have the largest RNA viral genomes, ranging from 26 to 32 kilo bases in length [14]. Coronavirus assembly was localized at membranes of the endoplasmic reticulum-Golgi middle compartment and is mediated by species-specific contacts of the Membrane (M) protein with Spike (S), Nucleocapsid (N), and envelope (E) proteins [15]. The trimers of the S protein build up the spikes of SARS-CoV and give the formation of a 1255 aminoacids length surface glycoprotein precursor. The SARS-CoV S

protein plays pivotal roles in viral infection and pathogenesis [16].The MERS-CoV (S) glycoprotein is a class I fusion protein made up of the amino N-terminal receptor-binding S1 and carboxyl C-terminal membrane fusion S2 subunits The S1 subunit consists of C domain, which contains the receptor-binding domain, and an N domain [17].The Envelop (E) protein (~8–12 kDa) was found in tiny quantities within the virion. The corona virus E protein is a highly divergent but has a general architecture. The membrane (M) protein was most plentiful structural protein in the virion and it has a (~25–30 kDa) small protein with three transmembrane domains and is provide the virion its shape. The nucleocapsid (N) was consists of two separate domains, an N-terminal domain and a C-terminal domain [18]. The following figure (1) and table (2) shows the structure and difference between the characterisation of SARS-CoV, MERS-CoV and COVID-19 corona viruses [19, 20, 16].

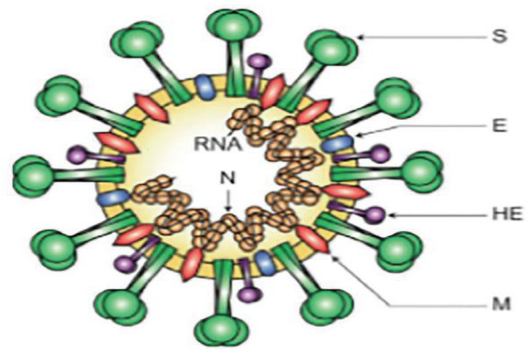


Figure 1: Structure of Corona virus
 Figure1: Coronavirus virion structure shown with structural proteins. N: Nucleocapsid protein; S: Spike protein, M: Membrane protein, HE: Hemagglutinin-Esterase and E: Envelope protein

Table 2: Different characteristics features of Coronaviruses

Characteristics	SARS-CoV	MERS-CoV	COVID-19
First patients reported	Guangdong, China, November 2002	Zarga, Jordan, April 2012, and Jeddah, Saudi Arabia, June 2012	Wuhan, China, December 2019
Virus	SARS-CoV	MERS-CoV	SARS-CoV-2
Genus	Betacoronavirus	Betacoronavirus	Betacoronavirus
The predominant receptor	Human angiotensin-converting enzyme 2ACE-2	Human dipeptidyl peptidase 4 (DPP4 or CD26)	ACE-2
Sequence similarity	-	-	79% to SARS-CoV, 50% to MERS-CoV
Possible Natural Reservoir	Bat	Bat	Unknown
Possible Intermediary Host	Palm civet	Dromedary camel	Bats and Animals sold at the seafood market in Wuhan might represent
Transmission	Contact with infected individuals	Contact with infected individuals and contact with infected dromedary camel	Contact with infected individuals, even asymptomatic one
Prevention	Personal hygiene, Hand hygiene and cough Etiquette Droplets		

IV. EPIDEMIOLOGY

The (SARS-CoV) emerged in 2003, more than 8000 peoples were affected in 26 countries and 774 people were dead. (MERS-CoV) were isolated in 2012 and has seen over 2400 cases reported to WHO, and 850 deaths occurred [21].The SARS-CoV can be replicated outside the respiratory tract, indicating the multi-tropism nature of the virus. The epidemiological analysis showed that the virus may well survive in stools for at least two days and in diarrhoeal stools, Page | 207

which contains higher pH, for up to four days. It is also capable of survive on plastic surfaces for up to 48 hours [22]. In mainland China, approximately 50% of probable SARS patients did not contain an apparent history of close personal contact with another case [23].The first reported case of MERS-CoV 1 occurred in Jeddah, Saudi Arabia on June 13, 2012. This outbreak was highly infected to health care workers (who were in direct contact with the patients) The clinical presentation of MERS-CoV ranges from flu-like symptoms, and Gastrointestinal symptoms, and 35% of cases,

acute renal failure necessitating hemodialysis has been reported. The health safety workers needed strict contact precautions, such as isolation and the use of personal protective equipment gloves, gowns, and N 95-typemasks. However, several pediatric cases have been reported in Saudi Arabia [24]. Recently, a statement of viral transmission from dromedary camel to human is reported. Earlier studies carried out in UAE in Dubai Emirate have shown the wide spread of MERS-CoV antibodies in dromedary camels [25]. The outbreaks were primarily connected with a market that sells mainly seafood, subsequently with limited human-to-human transmission, there was a spread of cases in Wuhan and surrounding areas. By mid-January 2020, cases have been identified in Thailand, Japan, South Korea, and other Chinese cities, as well as the United States [26]. That result in 31.3% of patients currently travelled to Wuhan and 72.3% of patients contacting with publics from Wuhan among the patients of non-residents of Wuhan. Transmission between healthcare workers occurred in 3.8% of COVID-19 patients, issued by the National Health Commission of China on 14 February 2020 [27].

V. CLINICAL PRESENTATION

Table 3: Clinical manifestations of three different Coronaviruses

Characteristics	SARS-CoV	MERS-CoV	COVID-19
Clinical manifestations			
Fever	99-100%	98%	83-98%
Cough	62-100%	83%	76-82%
Myalgia	45-61%	32%	11-44%
Headache	20-56%	11%	13.6%
Diarrhea	20-25%	26%	3.7%
Laboratory finding			
Leukopenia	25-35%	14%	9-25%
Lymphopenia	65-85%	32%	35-70%
Thrombocytopenia	40-45%	36%	5-12%

VI. INCUBATION PERIOD

The MERS-CoV has 5.2-12 days of median incubation period [25]. The SARS CoV incubation period is usually from 2-7 days [22]. And the current outbreak of COVID-19 median incubation period since five to six days, with a range from one to up to 14 days [33]. A recent study confirmed that it remains prudent to consider the incubation period of at least 14 days. the virus have been identified in respiratory tract specimens 1-2 days before the onset of

The COVID-19 was commonly caused fever, dry cough, fatigue, head pain, diarrhea [28]. The sputum production is increase, breathing trouble, aching throat (13.9%), arthralgia (14.8%), chills (11.4%), vomiting (5.0%), nasal congestion, and hemoptysis, and conjunctival congestion. The laboratories confirmed patients have had mild to moderate disease, which includes non-pneumonia and pneumonia cases, 13.8% have severe disease) and 6.1% of patient are caused critical (respiratory failure, septic shock, and/or multiple organ dysfunction) [29]. The people aged above 60 years and abnormal conditions such as hypertension, diabetes, cardiovascular disease, chronic respiratory disease and cancer, those peoples are highly affected and death was obtained. The COVID-19 appears in children is rare and (2.4%) of the total cases reported amongst individuals aged less than 19 years [30]. The Coronavirus were primarily isolated in bronchoalveolar lavage fluid samples, and viral RNA has been detected in nasopharyngeal and throat swabs as well as in serum, saliva, blood, rectal swabs, urine and stool [31].The following table(3) shows the clinical symptoms of SARS-CoV, MERS-CoV, and COVID-19 corona viruses [28,32].

symptoms and it can persist for 7-12 days in moderate cases and up to 2 weeks in severe cases [34].

VII. TRANSMISSION AND PREVENTION

The possible way of transmission of this infection is thought animal to human transmission. There have been various evidences, reporting the animal to human and inter-human transmission of the virus [35]. The WHO and US Centers for Disease Control and Prevention (CDC) and various bodies have issued advice on preventing further

spreading of COVID-19. Basic hand hygiene measures are also recommended, including frequent hand washing and the use of PPE such as face masks [36]. Peoples avoid close contact with the people who are suffering from acute respiratory infections. Avoiding unprotected contact with farm or wild animals [37]. The hand hygiene before and after touching the patient, whenever touching patients 'surroundings' or after contact with body fluids use of personal protective equipment, safe disposal of sharps and adequate management of the environment and hospital waste sterilization and disinfection of medical devices [38]. The people have mild cough or low grade fever and other symptoms they should stay at home and self isolate is the safety precaution of corona virus [39].

VIII. CONCLUSION

Transmission of this virus in humans by the droplets of infected person and fomites and travelling from one place to another place. There is no specific medicine and vaccines are discovered to prevent the outbreak rate. The peoples who are having symptoms of cough, shortness of breath are recommended immediately to approach the doctors, avoid close contact and public contacts. To reduce the spread complete lock down of all the area are the measures taken by the government of all countries throughout the world, sanitizing with alcohol based sanitizers, properly washing hands before entering into house, wearing mask and so on. This is the only way to prevent the spread of virus and avoiding social contact and stay under the roof of the house.

IX. ACKNOWLEDGEMENTS

The authors wish to express their sincere thanks to the host Institution Dr.N.G.P. Arts and Science college, Management, Principal, Deans, Head of the Department, Guide and other all other staffs of Department of Biochemistry for rendering all the facilities and support. Communication number: DrNGPASC 2019-20 BS040.

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