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Study of some Parameter in Patient with Corona viures

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ABSTRACT

The "Coronaviridae family" is responsible for a wide range of infectious diseases, from the common cold to SARS and MERS. Coronaviruses are members of this family. The coronavirus is shown to be quite common in mammals as well as birds. There have been a total of six human-transmitted coronaviruses found up to this point. The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was identified for the first time in Wuhan, China, in the month of December 2019. Fever, a dry cough, and weariness are some of the more common symptoms of the disease; but, in extreme cases, the condition can lead to severe shortness of breath, hypoxia, and even death. According to the World Health Organization (WHO), the three primary modes of transmission for COVID-19 have been discovered. These modes include droplet and contact routes, airborne transmission, and fecal and oral modes of infection. The treatments that are currently available for COVID-19 are only intended to lessen the severity of the disease's side effects; a true cure for the disease has not yet been identified. According to the World Health Organization (WHO), preventative actions taken at the level of public health such as the quarantine of an infected person, the identification and monitoring of contacts, the disinfection of the environment, and the use of personal protective equipment can considerably reduce the likelihood of an epidemic of COVID-19.

KEYWORDS: Corona viures, parameter, patient, Severe acute respiratory syndrome.

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INTRODUCTION

The viruses that belong to the family Coronaviridae have a crown-like appearance due to the spikes that cover their surface; for this reason, they are referred to as corona viruses (crown)[1]. They utilize RNA as their genetic material, which results in severe disease. [2] On December 31, 2019, the WHO office in China identified the first confirmed case of the disease. In its early stages, the source of the sickness was not understood, which led to the condition being referred to as "pneumonia of unknown etiology." Subsequently, the Chinese Center for sickness Control determined that the condition was caused by a novel corona virus.[3] (COVID-19) is the term given to the sickness that the virus causes. The World Health Organization (WHO) designated COVID-19 as a pandemic on March 11, 2020, and they also gave this virus the name SARS-CoV-2.[4]

Origin of CoVs

Origin of CoVs Covs are zoonoses (spread between animals and humans) CoVs are also believed that CoVs originated from bats and transmitted to humans by some intermediate host.[5] There are two types of hypotheses regarding infection of CoVs to humans Someone suggests that natural selection is responsible for the current pathological stage of the virus Another hypothesis suggests that the non-pathogenic version of the virus entered the human body via some mammalian host.[6]

1.2 The transmission Routes of CoVs

Knowing the transmission methods can reduce the disease prevalence The COVID-19 virus can be transmitted through droplets and contact in two ways:[7]

(1) direct contact with infected people.

(2) indirect contact with surfaces used by an infected person.Airborne transmission : Transmission of the virus

through airborne particles is one of the main transmission routes of COVID - 19 diseaseFecal and oral : gastrointestinal symptoms are a common symptom of COVID - 19 disease .[8]

1.3-Pathogenesis and immune response

Stage 1 : Asymptomatic (one or two days after infection) . Inhaled SARS - CoV - 2 virus likely binds to epithelial cells in the nasal cavity and begins replication .There is a local spread of the virus but a limited innate immune response . At this point , the virus can be detected by nasal swabs .Nasal swabs may be more sensitive than throat swabs .[9]

Stage 2 : upper airway response procedure (next few days) . The virus spreads and migrates through the respiratory tract along the connecting airways , and a more robust innate immune response is triggered . Nasal swabs or sputum should produce SARS - CoV - 2 as well as early signs of an innate immune response .[10][11]

Stage 3 : Unfortunately , about 20 % of affected patients will progress to stage III disease and will develop pulmonary infiltrates and some will develop very severe disease .The virus now reaches the gas exchange units of the lung and infects type II alveolar cells . CoV spreads within type II cells ,

a large number of viral particles are released , and the cells undergo apoptosis and die .[12][9]

1-4 Diagnosis

The assenting diagnosis of COVID - 19 is dependent on the viral isolation by polymerase chain reaction (PCR) from sputum , or nasal swab , or throat swab for the categories of those with symptoms or potentially exposed.- The real - time - reverse transcription (RT) -PCR detection of viral nucleic acid test (NAT) is considered as sensitive , specific and able to process large batches of samples .[13]

-The RT - PCR results generally become positive after 2-8 days.[14]

- Computed tomography (CT) can be considered as an essential supplemental investigative tool for the detection of COVID - 19 pneumonia in this pandemic context .[15][16]

- In severe cases , CT plays an important role in identifying viral lung infection , examining the nature and extent of pulmonary lesions , and scrutinizing the disease severity.[17][18]

1-5 Complete blood count alterations in COVID – 19

laboratory examination which can give accurate information about patients ' hematologic parameters .[19] Routine complete blood count with automated hematology analyzers can give information about the estimated number of red blood cells , white blood cells , and platelets in the circulation , including their parameters and differential count.

1.1.5 Erythrocyte Parameters in COVID – 19

1-The degree of the decline in hemoglobin level is correlated with COVID - 19 disease severity .

2-Several studies found that the hemoglobin Level in severe COVID - 19 patients and those admitted to ICU were significantly lower than those with a mild and moderate disease without the requirement of ICU admission .[20][21]

3-Enabling the measurement and monitoring of hemoglobin levels to be a predictor or warning system for disease severity.

4-Hematocrit and hemoglobin levels tend to decrease in progressive disease severity while RDW progressively increasing in the opposite direction .[22]

1.2.5 Leukocyte Parameters and Differential Count in COVID -19

1-the patients with COVID 19 tend to have lower leukocyte levels than healthy people . However , during observation patients with severe disease have higher leukocyte levels than those with mild - moderate disease .[23]

2-Leukocyte differential count may provide more details and may serve as a predictor for the degree of disease severity and prognosis of the patient .[24]

3- Patients with COVID - 19 tend to have lower eosinophil and lymphocyte levels and higher levels of neutrophil and monocyte compared to healthy people .[24]

4-Patients who have a delayed eosinophil level increase tend to have a lower severity compared to those who have experienced a delayed eosinophil increase[25].

The pathophysiology of low eosinophilia in COVID-19 patients remains unclear.

5-The underlying cause of lymphopenia is not clearly understood yet.* This may be related to the virus's ability to infect T lymphocytes through the Angiotensin converting enzyme 2 (ACE2) receptor and CD147 - spike proteins .

*It is thought that SARS CoV 2 may directly invade and damaging the lymphocytes .[25]

6-Leukocyte measurement and differential count are widely available , relatively affordable , and time - efficient .[26]

1.6 Symptoms The incubation phase of COVID – 19 is 3-7 days globally .

Approximately 80 % of infectious cases remain mild or asymptomatic , 15 % are severe and 5 % infectious cases turn to critical , who require ventilation .[28] Three major courses of infection include mild disease with upper res- piratory symptoms , non - severe pneumonia , and severe pneumonia complicated by acute respiratory distress syndrome (ARDS) and multi organ failure . Fever and cough are the foremost common symptoms , whereas dyspnea , fatigue , shortness of breath and chest distcomfort are observed in moderate to severe cases.[27]

1.7 Preventive Measures

Nosocomial spread is usually controlled through prelimi- nary infection control measures, includingwearing of face masks, respiratory etiquette, hand and environmental hygiene.[29] Personal protective equipment (PPE) is a vital element; Quarantine or physical segregation is vital to confirm effectiveness, including short- to medium-term lockdowns, voluntary home curfew, curb on the gathering ofpeople, cessation of social and public events and closure of mass transit systems.[30]

Treatment

The treatments include isolation, symptomatic support, and close mon- itoring of condition changes, especially breathing rate and finger pulse ox- ygensaturation.Every suspected case should be treated in single room, Critical cases should be admitted to the ICU as soon as possible.[31]

Antiviral treatment

No effec- tive antiviral treatment iscurrently confirmed".Based on trying drugs of alpha-interferon aerosol inhalation and lopinavir/ritonavir, "or add ribavirin" is supplemented.[32] The key to reduce case fatality rate is successful treatment of severe and critical cases. Prevent and cure complications actively, treat basic diseases, prevent secondary infections, and provide timely organ functions upports.[33]

Respiratory support

(1) Oxygen therapy: severe patients should be provided inhalation oxygen with facemask or nasal catheter. [34]

(2) High-flow nasal catheter oxygen therapy or non-invasive mechani- cal ventilation.[32][33]

(3) Invasive mechanical ventilation: lung protective ventilation strategies should be used. [31]

(4) For pa- tients with severe acute respiratory distress syndrome (ARDS), it is recommended to perform lung expansion.[34]

Other treatment measures

Glucocorticoids can be used in a short period of time (3-5 days) according to the severity of respiratory distress and the progress of chest imaging. Microecological preparation can be used to keep the equilibrium for intes- tinal microecology and prevent secondary bacterial infection.[33[Convalescent plasma therapy can be used. For critically ill patientswith high inflamma-tory response.

REFERENCES

I. Lu H, Stratton CW, Tang YW: Outbreak of Pneumonia of Unknown Etiology in Wuhan China: the Mystery and the Miracle. J Med Virol 2020.

II. Hui DS, E IA, Madani TA, Ntoumi F, Kock R, Dar O, Ippolito G, McHugh TD, Memish ZA, Drosten C et al: The continuing 2019-nCoV epidemic threat of novel coronaviruses to global health The latest 2019 novel coronavirus outbreak in Wuhan, China. Int J Infect Dis 2020, 91:264266.

III. Gorbalenya AEA: Severe acute respiratory syndrome-related coronavirus: The species and its viruses a statement of the Coronavirus Study Group.

IV. Burki TK: Coronavirus in China. Lancet Respir Med 2020.

V. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, Zhang L, Fan G, Xu J, Gu X et al: Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet 2020.

VI. Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, Qiu Y, Wang J, Liu Y, Wei Y et al: Epidemiological and clinical characteristics of 99 cases of 2019.

VII. Zhou P, Yang XL, Wang XG, Hu B, Zhang L, Zhang W, Si HR, Zhu Y, Li B, Huang CL et al: A pneumonia outbreak associated with a new coronavirus of probable bat origin. Nature 2020.

VIII. Hughes J. Wilson M, Luby S, Gurley E, Hossain M: Transmission of human infection with Nipah virus. Clin Infect Dis 2009, 49(11):1743- 1748.

IX. Alagaili AN, Briese T, Mishra N, Kapoor V, Sameroff SC, Burbelo PD, de Wit E, Munster VJ, Hensley LE, Zalmout IS et al: Middle East respiratory syndrome coronavirus infection in dromedary camels in Saudi Arabia. mBio 2014, 5(2):e00884-00814.

X. Brennan G, Kitzman JO, Rothenburg S, Shendure J. Geballe AP: Adaptive gene amplification as an intermediate step in the expansion of virus host range. PloS Pathog 2014, 10(3):e1004002.

XI. Wan Y, Shang J, Graham R, Baric RS, Li F: Receptor recognition by novel coronavirus from Wuhan: An analysis based on decade-long structural studies of SARS. Journal of Virology 2020:JVI.00127-00120.

XII. Peiris JSM, Guan Y, Yuen KY: Severe acute respiratory syndrome. Nature Medicine 2004, 10(12):S88-S97.

XIII. Zaki AM, van Boheemen RA:S, Bestebroer TM, Osterhaus AD, Fouchier Isolation of a novel coronavirus from a man with pneumonia in Saudi Arabia. The New England journal of medicine 2012, 367(19):18141820.

XIV. Patel A JD: Initial Public Health Response and Interim Clinical Guidance for the 2019 Novel Coronavirus Outbreak-United States, December 31, 2019-February 4, 2020. MMWR Morb Mortal Wkly Rep 2020, 69:140.

XV. Jin YH, Cai L, Cheng ZS, Cheng H, Deng T, Fan YP, Fang C, Huang D, Huang LQ, Huang Q et al: A rapid advice guideline for the diagnosis and treatment of 2019 novel coronavirus (2019-nCoV) infected pneumonia (standard version). Mil Med Res 2020, 7(1):4.

XVI. Lei J, Li J, Li X, Qi X: CT Imaging of the 2019 Novel Coronavirus (2019nCoV) Pneumonia. Radiology 2020:200236.

XVII. Tang JW, Tambyah PA, Hui DSC: Emergence of a novel coronavirus causing respiratory illness from Wuhan, China. The Journal of infection 2020.

XVIII. Habibzadeh P, Stoneman EK: The Novel Coronavirus: A Bird's Eye View. The international journal of occupational and environmental medicine 2020, 11(2):65-71.

XIX. Organization WH: Global Surveillance for human infection with novel coronavirus (2019-nCoV). In.; 2020.

XX. Gidengil C, Parker A, Zikmund-Fisher B: Trends in risk perceptions and vaccination intentions: a longitudinal study of the first year of the HINI pandemic. Am J Public Health 2012, 102: 672-679.

XXI. Paraskevis D, Kostaki EG, Magiorkinis G, Panayiotakopoulos G, Sourvinos G. Tsiodras S: Full-genome evolutionary analysis of the novel corona virus (2019-nCoV) rejects the hypothesis of emergence as a result of a recent recombination event. Infection, Genetics and Evolution 2020:104212.

XXII. Randhawa GS, Soltysiak MPM, El Roz H, De Souza CP, Hill KA, Kari L: Machine learning analysis of genomic signatures provides evidence of associations between Wuhan 2019-nCoV and bat betacoronaviruses. BioRxiv 2020.

XXIII. Yang Y, Sugimoto JD, Halloran ME, Basta NE, Chao DL, Matrajt L, Potter G. Kenah E, Longini IM, Jr.: The transmissibility and control of pandemic influenza A (H1N1) virus. Science 2009, 326(5953):729733.

XXIV. Liu Y, Gayle A, Wilder-Smith A, J. R: The reproductive number of COVID-19 is higher compared to SARS coronavirus. J Travel Med 2020.

XXV. Kucharski A, Althaus C: The role of superspreading in Middle Eastrespiratory syndrome coronavirus (MERS-CoV) transmission. Euro Surveill 2015, 20(25):pii=21167.

XXVI. Kampf G, Todt D, Pfaender S. Steinmann E: Persistence of coronaviruses on inanimate surfaces and its inactivation with biocidal agents. J Hosp Infect 2020.

XXVII. Rothe C, Schunk M, Sothmann P, Bretzel G, Froeschl G. Wallrauch C. Zimmer T, Thiel V, Janke C, Guggemos W et al: Transmission of 2019nCoV Infection from an Asymptomatic Contact in Germany. N Engl J Med 2020.

XXVIII. Kupferschmidt K: Study claiming new coronavirus can be transmitted by people without symptoms was flawed. In: Science News. 2020. 20.Bai Y, Yao L, Wei T, Tian F, Jin DY, Chen L, Wang M: Presumed Asymptomatic Carrier Transmission of COVID-19. JAMA 2020.

XXIX. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, Zhang L, Fan G, Xu J, Gu X et al: Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet 2020, 395(10223):497-506.

XXX. Chu DKW, Pan Y, Cheng SMS, Hui KPY, Krishnan P, Liu Y, Ng DYM, Wan CKC, Yang P, Wang Q et al: Molecular Diagnosis of a Novel Coronavirus (2019-nCoV) Causing an Outbreak of Pneumonia. Clin Chem 2020.

XXXI. Global Surveillance for human infection with novel coronavirus (2019- nCoV). In.: World Health Organization; 2020.

XXXII. Organization WH: Clinical management of severe acute respiratory infection when novel coronavirus (2019-nCoV) infection is suspected. In.; 2020.

XXXIII. Russell C, Millar J, Baillie J: Clinical evidence does not support corticosteroid treatment for 2019-nCoV lung injury. Lancet 2020, 395(10223):473-475.

XXXIV. Paules CI, Marston HD, Fauci AS: Coronavirus Infections-More Than Just the Common Cold. JAMA 2020.