EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 7
Issue: 6
589-591
Year: 2020

COVID-19: A BRIEF NARRATIVE

Bharat Sontakke*[1], Vishwajit Deshmukh[1] and Satyendra C. Tripathi[2]

[1]Department of Anatomy, AIIMS Nagpur, MH, India.
[2]Department of Biochemistry, AIIMS Nagpur, MH, India.

***Corresponding Author: Dr. Bharat Sontakke**
Department of Anatomy, AIIMS Nagpur, MH, India.
Email ID: sontakkebr@aiimsnagpur.edu.in,

Article Received on 22/04/2020 **Article Revised on 13/05/2020** **Article Accepted on 02/06/2020**

ABSTRACT
Coronavirus disease 2019 (COVID-19) has almost spread to all the countries till date. SARS-CoV-2 is the causative agent of this disease. At present COVID-19 has caused 41,16,767 confirmed cases and 2,82,872 deaths worldwide. The early diagnosis and management of the disease remains a major challenge all over. We searched the literature in "Pubmed", "Web of knowledge", "Medline", "Google Scholar" and "World Health Organization-WHO" using the keywords "severe acute respiratory syndrome", "Coronavirus", "COVID-19, "2019-nCoV", "SARS-CoV-2", "SARS", "Epidemiology" "Transmission", "Pathogenesis" and "Clinical Characteristics". In this overview topic, our aim is to summarize the updated epidemiology, etiology, clinical presentation, diagnosis and prevention & control of the novel coronavirus SARS-CoV-2. This knowledge will be essential to both manage the current pandemic and to contribute the measures to prevent such outbreaks in near future.

KEYWORDS: COVID-19, SARS-CoV-2, Corona Virus, Virus.

INTRODUCTION
Coronavirus disease (COVID-19), a zoonotic disease has a serious threat to public health caused by Novel Coronavirus (SARS-CoV-2).[1] It has been originated in sea food market of Wuhan; most populous capital city of Hubei Province of Central China has caused a large number of positive cases as well as deaths worldwide in humans.[2] The usual symptoms are presenting with are fever, cough, sore throat, shortness of breath, fatigue & malaise. Loss of taste and smell has also been reported in a few cases. Many of the people are asymptomatic. China informed the WHO about the outbreak of unknown etiologic pneumonia cases on 31st Dec 2019. On Jan 7 th, 2020, the infectious organism was identified as a strain of Coronavirus. Common laboratory findings included normal or low white cell count with increased C-reactive protein.[3]

The coronavirus belongs to family Coronaviridae with two subfamilies Orthocoronavirinae and Torovirinae. Orthocoronavirinae has four genera; alpha, beta, gamma and delta Coronavirus. Alpha & beta corona viruses circulate in mammals including bats, gamma corona viruses infect avian species with few mammals and delta corona viruses infect birds & mammals.[4] Several bat species (predominantly horseshoe bat) isolates showed SARS-CoV like viruses. So, bats are considered a reservoir of these viruses. SARS-CoV isolated from humans can efficiently infect as well be transmitted by domestic cats, mice, Syrian hamsters and rhesus macaques.[5] To date seven human corona viruses were identified including the recent 2019 novel coronavirus.[6] SARS-CoV-1, MERS-CoV, SARS-CoV-2 can cause severe respiratory diseases in humans. SARS-CoV-2 is a spherical RNA virus with proteins called spikes protruding from their surface. These spikes attach to receptors on the human cells surface i. e. ACE2 (angiotensin-converting enzyme) followed by structural changes which allow the viral membrane to fuse with human cell membrane. The spike glycoprotein on the virus is used as a target for the development of vaccine and antibodies. Current evidences confirm that SARS-CoV-2 virus is primarily transmitted between people through respiratory droplets and contact route. Coronavirus can remain in the aerosol for up to 3 hours. SARS-CoV-2 is more stable on stainless steel for 48 hours and on plastic surfaces for 72 hours. On the copper surface SARS-CoV-2 is stable for 4 hours as compared to 8 hours of SARS-CoV-1. On cardboard surface SARS-CoV-2 will remain stable till 24 hours as compared to 8 hours of SARS-CoV-1.

Common symptoms and diagnosis of Covid-19
Patients present with fever, cough, sore throat, headache, fatigue, myalgia and respiratory distress. The disease is mild in elderly and elderly with comorbidities may progress to pneumonia, acute respiratory distress syndrome (ARDS), & multi-organ failure. Many of the

people are asymptomatic.[3] The incubation period for this infection is 2-14 days. The pediatric patients showed mild symptoms but with longer incubation period.[7] At the end of the first-week patient may complicate with respiratory failure and possible death.

In suspected cases, confirmative diagnosis is only possible using specific molecular tests performed on swabs collected from the throat, nasopharynx, sputum or endotracheal aspirates or bronchoalveolar lavage in more critical patients. The definitive diagnosis is based on the RT-PCR analysis.[8]

A more reliable, sensitive and specific investigation is chest CT scan. CT images usually show infiltrates, ground-glass opacities and subsegmental opacities. The recommended current scenario is to perform the CT investigation for the diagnosis of COVID-19 in suspected cases with negative PCR results.[9]

Future challenges and treatment protocol for COVID-19 Infection

An increase in COVID-19 cases from SARS-CoV-2 infection may pose a global public health threat which is challenging to medical and research communities. Many asymptomatic individuals may transmit SARS-CoV-2 and afterward can become symptomatic.[10] In response to this outbreak, many affected countries have applied travel restrictions and lockdown in attempts to attenuate further transmission of this disease. Presently, a major challenge with COVID-19 infection is the treatment of a patient with a weak immune system and those suffering from a chronic disease like cancer, respiratory or cardiovascular illness. There is a higher risk of SARS-CoV-2 infection-related mortality with hypertensive, diabetic and cardiovascular diseases patients suggested by the studies done recently.[11, 12] Such subjects will require a special attention. Patients who are on ACE inhibitors are with risk of treatment intensification when exposed to NSAIDs.[13] In such patients ACE2 expression is increased through the use of ibuprofen. NSAIDs will antagonize the effects of anti-hypertensive drugs by inhibiting cyclo-oxygenase and prostaglandin secretion.[14] NSAID exposure can also increase the blood pressure by in previously controlled hypertensive subjects.[15, 16] Because of perinatal physiological changes in their immune and cardiopulmonary systems, a pregnant women is susceptible to severe illness like SARS-CoV-2 infection.[17] The vertical transmission can be prevented by cesarean section in a negative-pressure operating room.[18] The complications can be fetal distress, premature rupture of the membrane (PROM), stillbirth or preterm labor.[19] This is very clear that immunosuppressed patients have a higher risk of COVID-19 complications more concerned with patients undergoing organ transplantation.[20] After a cross-sectional study on 204 COVID-19 infected patients, authors noted the most common digestive disorder symptoms as lack of appetite (78.6%), diarrhea (34%), vomiting (3.9%), and abdominal pain (1.9%).[21] Mild to moderate liver dysfunction was also observed in COVID-19 infection but there is no clear indication of liver-specific SARS-CoV-2 infection.[22] Cancer patients are also more susceptible to COVID-19 infection due to immune-suppression caused by malignancy and anti-cancer treatment.[23,24]

Precautions to contain Spread of pandemic

All prevention strategies are to minimizing or break the chain of transmission of SARS-CoV-2. To prevent the spread of the coronavirus international travel should be limited or avoided if needed. The virus can remain viable on the surface for days but can be easily destroyed by the alcohol-based hand sanitizers, sodium hypochlorite and hydrogen peroxide. The best prevention strategy is to avoid contact with those affected. Well fitted N95 and surgical masks should be used to seal against entry of airborne droplets. As SARS-CoV-2 is encapsulated, washing hands for more than 20 seconds with soap and hot water is the best way to avoid the transmission of the virus. Lastly, frequent cleaning of doorknobs, handrails and other contact surfaces should be implemented to avoid transmission of infection.

CONCLUSION

Due to lack of a vaccine and effective antiviral therapy a life-threatening disease (COVID-19) requires a great supportive care. High-risk subjects like aged individuals and immune-compromised persons should be protected more. It is important to contribute the recent scientific knowledge into the current practice and clinical management of this disease to reduce the spread of SARS-CoV-2. It is the need of the hour to devise comprehensive measures to prevent and manage outbreaks of viruses and pathogens which are inevitable.

ACKNOWLEDGMENTS: None.

Funding: None.

Competing interests: None declared.

Ethical approval: Not required.

REFERENCES

1. Ye, Zi-Wei, Shuofeng Yuan, Kit-San Yuen, Sin-Yee Fung, Chi-Ping Chan, and Dong-Yan Jin. 2020. "Zoonotic Origins of Human Coronaviruses." *International Journal of Biological Sciences*, 16(10): 1686–97. https://doi.org/10.7150/ijbs.45472.
2. Li, Heng, Shang-Ming Liu, Xiao-Hua Yu, Shi-Lin Tang, and Chao-Ke Tang. 2020. "Coronavirus Disease 2019 (COVID-19): Current Status and Future Perspectives." *International Journal of Antimicrobial Agents*, March. https://doi.org/10.1016/j.ijantimicag.2020.105951.
3. Singhal, Tanu. 2020. "A Review of Coronavirus Disease-2019 (COVID-19)." *Indian Journal of Pediatrics*, 87(4): 281–86. https://doi.org/10.1007/s12098-020-03263-6.

4. Ashour, Hossam M., Walid F. Elkhatib, Md Masudur Rahman, and Hatem A. Elshabrawy. 2020. "Insights into the Recent 2019 Novel Coronavirus (SARS-CoV-2) in Light of Past Human Coronavirus Outbreaks." *Pathogens*, 9(3): 186. https://doi.org/10.3390/pathogens9030186.
5. Li, Wenhui, Swee-Kee Wong, Fang Li, Jens H. Kuhn, I.-Chueh Huang, HyeryunChoe, and Michael Farzan. 2006. "Animal Origins of the Severe Acute Respiratory Syndrome Coronavirus: Insight from ACE2-S-Protein Interactions." *Journal of Virology*, 80(9): 4211–19. https://doi.org/10.1128/JVI.80.9.4211-4219.2006.
6. Kothai, Ramalingam, and Balasubramanian Arul. 2020. "2019 Novel Coronavirus: A Mysterious Threat from Wuhan, China–A Current Review." *International Journal of Research in Pharmaceutical Sciences*, 11(SPL1): 7–15. https://doi.org/10.26452/ijrps.v11iSPL1.1975.
7. Chen, Juan, Zhen-Zhen Zhang, Yao-Kai Chen, Quan-Xin Long, Wen-Guang Tian, Hai-Jun Deng, Jie-Li Hu, et al. 2020. "The Clinical and Immunological Features of Pediatric COVID-19 Patients in China." *Genes & Diseases*, April. https://doi.org/10.1016/j.gendis.2020.03.008.
8. Holshue ML, DeBolt C, Lindquist S, et al. First Case of 2019 Novel Coronavirus in the United States. N Engl J Med, 2020; 382(10): 929-36.
9. Huang P, Liu T, Huang L, et al. Use of Chest CT in Combination with Negative RT-PCR Assay for the 2019 Novel Coronavirus but High Clinical Suspicion. Radiology, 2020; 295(1): 22-3.
10. Qian G, Yang N, Ma AHY, et al. A COVID-19 Transmission within a family cluster by presymptomatic infectors in China. Clin Infect Dis. 2020;10.1093/cid/ciaa316.
11. He XW, Lai JS, Cheng J, et al. [Impact of complicated myocardial injury on the clinical outcome of severe or critically ill COVID-19 patients]. Zhonghua Xin Xue Guan Bing Za Zhi, 2020; 48(0): E011.
12. Zhou F, Yu T, Du R, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. Lancet, 2020; 395(10229): 1054-62.
13. Fournier JP, Sommet A, Bourrel R, et al. Non-steroidal anti-inflammatory drugs (NSAIDs) and hypertension treatment intensification: a population-based cohort study. Eur J Clin Pharmacol, 2012; 68(11): 1533-40.
14. Ray WA, Stein CM, Hall K, et al. Non-steroidal anti-inflammatory drugs and risk of serious coronary heart disease: an observational cohort study. Lancet, 2002; 359(9301): 118-23.
15. Johnson AG, Nguyen TV, Day RO. Do nonsteroidal anti-inflammatory drugs affect blood pressure? A meta-analysis. Ann Intern Med, 1994; 121(4): 289-300.
16. Pope JE, Anderson JJ, Felson DT. A meta-analysis of the effects of nonsteroidal anti-inflammatory drugs on blood pressure. Arch Intern Med, 1993; 153(4): 477-84.
17. Yang H, Wang C, Poon LC. Novel coronavirus infection and pregnancy. Ultrasound Obstet Gynecol. 2020;10.1002/uog.22006.
18. Li Y, Zhao R, Zheng S, et al. Lack of Vertical Transmission of Severe Acute Respiratory Syndrome Coronavirus 2, China. Emerging Infect. Dis, 2020; 26(6).
19. An Update and Guidance on 2019 Novel Coronavirus (2019-nCov) for Transplant ID Clinicians. TRANSPL INFECT DIS. 2020, https://tts.org/tid-about/tid-presidents-message/23-tid/tid-news/657-tid-update-and-guidance-on-2019-novel-coronavirus-2019-ncov-for-transplant-id-clinicians.
20. Pan L, Mu M, Yang P, et al. Clinical characteristics of COVID-19 patients with digestive symptoms in Hubei, China: a descriptive, cross-sectional, multicenter study. Am J Gastroenterol. 2020;doi:10.14309/ajg.0000000000000620:25.
21. Gu J, Han B, Wang J. COVID-19: Gastrointestinal manifestations and potential fecal-oral transmission. Gastroenterology. 2020;10.1053/j.gastro.2020.02.054.
22. Liang W, Guan W, Chen R, et al. Cancer patients in SARS-CoV-2 infection: a nationwide analysis in China. Lancet Oncol, 2020; 21(3): 335-7.
23. Tian S, Hu W, Niu L, et al. Pulmonary Pathology of Early-Phase 2019 Novel Coronavirus (COVID-19) Pneumonia in Two Patients With Lung Cancer. J Thorac Oncol. 2020;10.1016/j.jtho.2020.02.010.
24. Hofmann H, Pyrc K, van der Hoek L, et al. Human coronavirus NL63 employs the severe acute respiratory syndrome coronavirus receptor for cellular entry. Proc Natl Acad Sci U S A, 2005; 102(22): 7988-93.