Journal of Surgery and Trauma 2020; 8(3):81-83.
jsurgery.bums.ac.ir

LETTER TO EDITOR

Clinical characteristics of COVID-19 and personal protective equipment for trauma surgeons

Saeedeh Ghasemi[1], Majid Zare Bidaki[2]✉

[1]*Birjand University of Medical Sciences, Birjand, Iran*

[2]*Medical Microbiology Infectious Diseases Research Center, Birjand University of Medical Sciences, Birjand, Iran*

Received: June 06, 2020 ***Revised: August 07, 2020*** ***Accepted: August 10, 2020***

Dear Editor

Introduction and background

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by a new virus from the coronavirus family (1) regarded as enveloped, positive-sense, single-stranded ribonucleic acid (RNA) viruses with helical symmetric nucleocapsid (2). According to the whole genome sequencing and phylogenetic analysis of coronavirus strains, a distinct clade of betacoronavirus is shown to be associated with severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (3). This novel clade is called the 2019 novel coronavirus (2019-nCoV) and due to more similarity to the SARS virus is also called severe acute respiratory syndrome coronavirus 2. The disease is known as COVID-19.

Clinical findings

The clinical spectrum of this emerging disease is unclear ranging from asymptomatic or paucisymptomatic infections to respiratory problems requiring mechanical ventilation and intensive care unit stay, systemic manifestations of sepsis, septic shock, and multiple organ dysfunction syndrome (4-6).

Fatal COVID-19 infection overwhelms the normally protective profibrinolytic signaling of the urokinase pathway leading to overall dysregulation, including increased Serpine1 expression and severe pulmonary disease. Although fibrin is required for normal wound healing, the persistent and excessive levels of intra-alveolar fibrin can contribute to acute inflammatory and chronic interstitial lung disease (4). In general, the initial non-specific symptoms of COVID-19 include fever, dry cough, and malaise. In addition, the most common signs and symptoms related to this condition are fever (98%), cough (76%), shortness of breath (55%), and malaise and fatigue (44%) (5).

Clinical and paraclinical diagnoses

Suspected cases of COVID-19 can be detected through the determination of clinical symptoms, vital parameters (e.g., body temperature and pulse oximetry), and radiography (e.g., X-ray and chest computed tomography [CT] scan) (6). Laboratory findings include lymphopenia and raised lactate dehydrogenase. It is reported that the earliest abnormal finding in a CT scan is the appearance of ground-glass opacities in peripheral and subpleural areas (7). A definitive diagnosis is obtained through viral isolation using nasopharyngeal and oropharyngeal swab sampling followed by polymerase chain reaction (8).

According to the literature, other symptoms associated with COVID-19 have been reported, including skin manifestations (e.g., erythematous rash, widespread urticaria, and chickenpox-like

@2020Journal of Surgery and Trauma
Tel: +985632381203
Fax: +985632440488
Po Box 97175-379
Email: jsurgery@bums.ac.ir

✉**Correspondence to:**
Majid Zare Bidaki, Medical Microbiology Infectious Diseases Research Center, Birjand University of Medical Sciences, Birjand, Iran;
Telephone Number: +989151567683
Email Address: m.zare@live.co.uk

[Downloaded from jsurgery.bums.ac.ir on 2026-11-11]

[DOI: 10.32592/jsurgery.2020.8.3.100]

vesicles), gastrointestinal symptoms (e.g., nausea, vomiting, diarrhea, and abdominal discomfort) (9), and heart complications (e.g., acute myocarditis and heart failure) (10). Several studies have also reported the effects of 2019-nCoV on the human nervous system (11). The genomic RNA of the virus was detected in the cerebrospinal fluid of a 15-year old male patient with acute demyelinating encephalomyelitis (12). In addition, acute encephalitis due to coronavirus infection was reported in an immunodeficient 11-month-old male neonate with severe combined immunodeficiency (12).

In Iran, as one of the highly COVID-19 infected countries, there are countless COVID-19 cases reporting the loss of their sense of smell and taste (5). Some studies have also demonstrated that coronavirus can enter the olfactory and trigeminal nerves (13), causing dysosmia and dysgeusia (5). Therefore, this viral pathogen, along with fever, fatigue, dry coughs, anorexia, dysentery, and rhinorrhea (6), may also cause neurological symptoms, such as the loss of sense of smell and taste as well as skin and gastrointestinal manifestations. As a result, it is required to carry out further studies to investigate all different manifestations of the disease.

Prevention in surgery wards

Due to the wide spread of this pathogen around the world, which made it a pandemic disease, and a serious risk to public health, it is highly recommended to screen and isolate individuals with these symptoms for nCoV-2019 in order to prevent the virus transmission and spread.

With the COVID-19 crisis, recommendations for personal protective equipment (PPE) are necessary for the protection in orthopedics and traumatology wards. The clinical pathway is initiated with the screening of body temperature and evaluation of influenza-like symptoms. A single-bed recovery room may be present in emergency departments, and the patient is referred to this room. Subsequently, the physician performs the oropharyngeal swab sampling using PPE as previously described. The patients are then admitted to a dedicated ward to wait for the result of the oropharyngeal swab sampling.

Orthopedic and trauma surgery using power tools, pulsatile lavage, and electrocautery are surgical aerosol-generating procedures, and all body fluids contain virus particles. Raising the awareness of the aforementioned issues will help avoid the occupational transmission of COVID-19 to the surgical team by the aerosolization of blood or other body fluids; therefore, adequate PPE should be available and used during orthopedic surgery. In addition, efforts have to be made for the improvement of the current evidence in this regard.

Enhanced PPE is defined as the use of either an N95 respirator plus face shield or powered air-purifying respirator, disposable surgical cap, and disposable gown and gloves. This should be utilized for any patient with an unknown, suspected, or positive COVID-19 condition requiring invasive examination or instrumentation of the oral cavity, oropharynx, nasal cavity, or nasopharynx. The appropriate sequence of donning and removing PPE is also of importance (14).

Conflicts of Interest

The authors declare that there is no conflict of interest.

References

1. Mardani M, Pourkaveh B. A Controversial Debate: Vertical Transmission of COVID-19 in Pregnancy. Arch Clin Infect Dis. 15(1):e102286. doi: 10.5812/archcid.102286.
2. the International CSG. The species Severe acute respiratory syndrome-related coronavirus: classifying 2019-nCoV and naming it SARS-CoV-2. Nat Microbiol. 2020; 5(4): 536–544.
3. Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, et al. A novel coronavirus from patients with pneumonia in China, 2019. N Engl J Med 2020;382:727-733
4. Gralinski LE, Bankhead A, Jeng S, Menachery VD, Proll S, Belisle SE, et al. Mechanisms of severe acute respiratory syndrome coronavirus-induced acute lung injury. MBio. 2013; 4(4):e00271-13.
5. Keyhan SO, Fallahi HR, Cheshmi B. Dysosmia and dysgeusia due to the 2019 Novel Coronavirus; a hypothesis that needs further investigation. SpringerOpen; 2020.
6. Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, et al. Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus–infected pneumonia in Wuhan, China. Jama. 2020;323(11):1061-1069.
7. Tahvildari A, Arbabi M, Farsi Y, Jamshidi P, Hasanzadeh S, Calcagno TM, et al. Clinical Features, Diagnosis, and Treatment of COVID-19 in Hospitalized

[Downloaded from jsurgery.bums.ac.ir on 2026-11-11]

[DOI: 10.32592/jsurgery.2020.8.3.100]

Patients: A Systematic Review of Case Reports and Case Series. Front. Med. 2020;7:231.

8. Recalcati S. Cutaneous manifestations in COVID-19: a first perspective. Journal of the European Academy of Dermatology and Venereology. 2020.
9. Gu J, Han B, Wang J. COVID-19: Gastrointestinal Manifestations and Potential Fecal–Oral Transmission. Gastroenterology. 2020.
10. Zheng Y-Y, Ma Y-T, Zhang J-Y, Xie X. COVID-19 and the cardiovascular system. Nature Reviews Cardiology. 2020; 17, pages259–260.
11. Perlman S, Jacobsen G, Afifi A. Spread of a neurotropic murine coronavirus into the CNS via the trigeminal and olfactory nerves. Virology. 1989; 170(2):556-60.
12. Yeh EA, Collins A, Cohen ME, Duffner PK, Faden H. Detection of coronavirus in the central nervous system of a child with acute disseminated encephalomyelitis. Pediatrics. 2004;113(1):e73-e6.
13. Perlman S, Evans G, Afifi A. Effect of olfactory bulb ablation on spread of a neurotropic coronavirus into the mouse brain. *J Exp Med.* 1990;172(4):1127-32.
14. Bann DV, Patel VA, Saadi R, Gniady JP, Goyal N, McGinn JD, et al. Impact of coronavirus (COVID-19) on otolaryngologic surgery: brief commentary. Head & Neck. 2020;42(6):1227-34.

[Downloaded from jsurgery.bums.ac.ir on 2026-11-11]

[DOI: 10.32592/jsurgery.2020.8.3.100]