Medical Staff Cases Infected with COVID-19 in Wuhan, China

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Abstract

We reported a cluster of 6 suspected medical staff cases infected with 2019 novel coronavirus disease (COVID-19) during January - March 2020. It described an epidemiological and clinical pattern with atypical presentation. To reduce the transmission levels of the virus in medical staff, we recommend appropriate precautions including viral nucleic acid detection and hospital infection control.

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Running Title:Medical Staff Infected with COVID-19

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The COVID-19 first identified in Wuhan, China brings an ongoing outbreak with global impact.(Huang et al., 2020; Zhu et al., 2020) According to the data from Chinese Centre for Disease and Prevention (CDC), 3019 suspected cases of COVID-19 in medical staffs were released, with 1716 cases confirmed and 5 dead. More attention should be paid to the medical staffs infected with COVID-19 and proactive steps should be taken to decrease infection risk.

Zhongnan Hospital of Wuhan University has been established as the largest COVID-19 designated hospital in Wuhan. From January 15 to March 30, 6 suspected COVID-19 cases (medical staff) were enrolled from the department of radiology. The symptoms of 6 suspected cases at onset and present were collected including fever, dry cough, myalgia, diarrhea, headache and generalized weakness. CT imaging results were approved by at least two high-level radiologists. Throat swab samples from 6 cases were collected for real-time reverse transcriptase polymerase chain reaction (RT-PCR) analysis to confirm COVID-19 infection.(Wang et al., 2020) To corroborate the outcome, each case repeated a least 5 times and the parallel control group was demanded. This study was approved by the institutional review board of Zhongnan Hospital of Wuhan University. Oral informed consent was obtained before enrolling participants.

Patient 1, a 30-year-old man, was in good health condition before infection. Fever (highest temperature reached 38.0), myalgia and cough (mainly dry) started on Jan 18, 2020(Table 1). He was admitted to travel

to a residential area near Huanan Seafood Market, which was noted as the epidemiological infection source by Huang. etc.(Huang et al., 2020) The chest thin-section CT showed ground glass opacity in one lung lobe on Jan 18. The patient soon underwent a RT-PCR test to examine the COVID-19 RNA of and the result showed positive. Three days after symptom onset, he was transferred to isolation ward and received standard treatment. Patient 1 was discharged from the hospital 2 weeks later. Patient 2, a 34-year-old man, had close contract with patient 1 before the epidemiological alarm of COVID-19. On Jan 23, he developed an unreasonable generalized weakness. CT results showed nodular areas of ground-glass opacity, bearing some resemblance to Patient 1. Low-dose spiral CT screening covered all the medical staffs in the department. Patient 3 developed flu-like symptoms (38.0) and chest radiography showed ground glass nodules. Patient 4 and Patient 5 were asymptomatic, but their CT images showed solitary solid nodules and RT-PCR tests presented the infection of COVID-19. On Feb 2, Patient 6 developed an acute onset of fever(37.8), dry cough, myalgia and diarrhea. CT images manifested a local high density nodule; however RT-PCR tests were negative. No new suspected case was detected from Feb 2 to March 30.

The suspected cases of medical staffs infected with COVID-19 described an epidemiological and clinical pattern with atypical presentation. In January 2020, some cases in medical staffs were identified, who admitted to close contact with patient without medical protection or visit to the epidemiological infection areas before symptom onset. The subsequent cases were admitted to have close contact with the primary cases including having a meal together, taking a car and discussing a case before the city lockdown alarm. In the meantime, all the suspected cases had a history of exposure to infected patients in workplace with N95 masks, eye shields and biohazard suits. Nevertheless, it is hard to perform case investigation, contact tracing and quarantine of exposed persons of COVID-19 infection in medical staffs.

Flu-like and gastrointestinal symptoms have been noted as the common symptoms of hospital patients (Wang et al., 2020), however, 40% medical staff cases developed no fever, dry cough or diarrhea. For some cases, depending solely on symptoms and CT imaging might lead to a false-negative result. CT imaging of mild or asymptomatic patients presented solid nodule instead of ground-glass opacification or consolidation.(Shi et al., 2020) This may be due to the ultra-early diagnosis of COVID-19 infection in medical staffs. Encouragingly, the additional detected cases declined significantly in medical staffs from Feb 2 to Mar 30; this is possibly attributed to the low-dose spiral chest CT screening and the isolation of suspected cases in medical staff.

Compared to SARS, COVID-19 shows higher infectivity and more difficulty to identify mild and asymptomatic cases.(Wu & McGoogan, 2020; Xu et al., 2020) Therefore, vigilant control measures are warranted beyond SARS.(Wang,Wang,Chen, & Qin, 2020) The contaminated zone and semi-contaminated zone has been strictly divided and the contract between staffs without medical protection is forbidden. It is meaningful to expand the samples and set a control group to study the COVID-19 infection in health care workers. In such cases, we suggest that medical staffs should present themselves for evaluation, to emphasize the importance to take appropriate precautions including the low-dose CT screening, the preventive viral nucleic acid detection and hotel isolation of health care workers in designated hospital. The best approach for interrupting transmission is not known, but it seems reasonable to take stringent protective measures and stress hospital infection control.

Data Availability Statement

All data generated or analyzed during this study are included in this article.

Ethics Statement

This work was approved by the Wuhan University institutional review board and the need for informed consent was waived.

CONFLICT OF INTEREST

The authors declared that they have no conflicts of interest to this work.

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