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Journal Pre-proof

Reply to “Coronavirus 2019-nCoV: A brief perspective from the front line”: Nosocomial SARS-CoV-2 infection among nurses in Wuhan from a single center

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Letter to the editor – Journal of Infection - Revision

Reply to “Coronavirus 2019-nCoV: A brief perspective from the front line”:

Nosocomial SARS-CoV-2 infection among nurses in Wuhan from a single center

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Dear Editor,

We read with great interest the brief perspective of COVID-19 by Han *et al*¹. As mentioned in their article, a highly infective disease caused by a newly identified coronavirus named SARS-CoV-2, COVID-19 is spreading around the world². And 1716 medical staff in China have been infected and 6 of them died from COVID-19

up to Feb. 11, 2020. The infection of medical staff has attracted worldwide attention. Most of them are nosocomial infection, however, the cause and route of the infection are not entirely clear.

Among medical staff, the contact between nurses and patients is most closely. Here we retrospective reviewed 32 nurses infected by SARS-CoV-2 from Zhongnan Hospital of Wuhan University, one of the largest local hospital which admitted a large number of COVID-19 patients^{3,4}.

The infected nurses were from 18 departments, among which the Departments of Emergency Medicine and Comprehensive Medical Care were the most infected, followed by Urology and Orthopedics. 65.6% (21/32) was from nosocomial infection, 15.6% (5/32) was infected outside the hospital, 18.8% (6/32) was unknown way for spreading infection. Among nosocomial infected nurses, 85.7% (18/21) had direct contact with confirmed COVID-19 patients without effective isolation measures, while 14.3% (3/21) of them were infected by contact with confirmed COVID-19 patients under the strict isolation conditions (Table1). The first infected nurse was diagnosed on Jan. 12, 2020. After Jan. 23, the number of infected nurses increased significantly, which was consistent with the national infection trend.

By following up the infected nurses, we analyzed the main causes of nosocomial infection to further avoid the risk of SARS-CoV-2 infection as following:

1. In the early stage of the epidemic, the early exposure was caused by the inadequate protective equipment, which accounts for 56.3% (18/32) of infections.
2. Cross infection in the living area without protection, we note that there were infected patients in most of their departments (4/6) among the nurses with unknown

causes of infection, although they did not care directly for infected patients.

3. Nurses' high-intensity work may lead to decrease of resistance.

In this regard, the Department of Nursing at Zhongnan Hospital of Wuhan University has taken some measures and successfully reduced the risk of infection among nurses:

1. To formulate nursing guidelines for three areas and two channels in general wards, strengthen management of medical waste, and prevent pollution during handover or transportation of medical waste.

2. To standardize the flow of medical personnel entering and leaving the isolation ward and strengthen the training of nurses in and out of isolation clothes / protective clothing. Strengthen the self-protection consciousness of nurses and reduce the time of not wearing masks in living areas.

3. In the isolation area, the allocation of nurses should be increased, and the shift should be carried out step by step, so as to reduce the workload of nurses and the exposure time.

4. Change the dining environment of nurses, avoid pushing, and try to eat separately in the ventilated room.

5. Train the hospital cleaner and apply for free CT screening for the fixed outsourcing personnel in the isolation ward.

Ethical Approval

All the patients provided written informed consent. All study procedures were performed in accordance with the ethical standards of the Institutional Ethics Review Committee.

Authors' contributions

All authors collected the clinical data. HS, ML and SC drafted the manuscript. ZC, YX and XW revised the final manuscript.

Declaration of Competing Interest

The authors have nothing to disclose.

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Table 1. SARS-CoV-2 infection among nurses in Zhongnan Hospital of Wuhan University

Variables	Case (n)	%
Gender		
Male	4	12.5
Female	28	87.5
Age/years		
Average/Median	33.8±7.3/32	
(Range)	22-56	
≤30	13	40.6
>30	19	50.4
Department		
Emergency Medicine	8	25.0
Comprehensive Medical Care	4	12.5
Urology	3	9.4
Orthopedics	3	9.4
Others	14	43.8
Infection route		
Nosocomial infection	21	65.6
<i>With isolation measures</i>	3	9.4
<i>Without isolation measures</i>	18	56.3
Out of hospital infection	5	15.6
Unclear	6	18.9