



Increased Incidence of Blood and Body Fluid Exposure and Lack of Transmission Evidence During COVID-19 Pandemic

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Abstract

Background: Coronavirus disease 2019 (COVID-19) pandemic has been associated with various risks, including the exposure of infectious agents.

Objectives: The study aims at describing the incidence of blood and body fluid (BBF) exposure in a COVID-19 facility so as viral transmission potential through blood.

Methods: A descriptive study of BBF exposure notified was carried out in a community hospital in Qatar.

Results: In 2020, 29 needlesticks injuries were reported, which is a significant increase compared to the year 2019 (6 incidents) and 2018 (5 incidents). No evidence of SARS-CoV-2 transmission was shown concerning the injury using symptoms monitoring and lab test.

Conclusion: The increased risk of BBF exposure during the pandemic provides insight into the need to review the prevention practices of occupational exposure during pandemics. Additional studies are required to define the risk of COVID-19 related to occupational exposure to BBF.

Keywords: COVID-19, SARS-CoV-2, Needle Stick Injuries, Occupational Exposure, Incidence, Transmission

1. Background

The coronavirus disease 2019 (COVID-19) pandemic has caught the attention of risks associated with healthcare, including exposure to infectious agents and the adverse psychological effects on healthcare professionals.¹⁻³ In addition, a concern of COVID-19 transmission as a consequence of needle stick injuries should be considered, considering the previous history of blood-borne infections, with particular reference to hepatitis B and C and HIV/AIDS.⁴

For blood and body fluid (BBF) exposure, and especially needlestick injuries, various factors favor its incidence, including the overwhelming number of patients assisted during the pandemic, shortages of staff, long in-service hours, and psychological distress.^{5,6}

Limited data have been published up to date about the incidence of BBF exposure during the COVID-19 pandemic.

2. Objectives

The study describes the incidence of BBF exposure in a COVID-19 facility and the potential of viral transmission through blood.

3. Methods

A descriptive study of BBF exposure was carried out from April to December, 2020 in a COVID-19 facility in Qatar. The facility is a community hospital with an original 75 beds capacity expanded to 388 beds exclusively for COVID-19 patients. From records available in the infection control department, the incidence of BBF exposure data was collected, and from files (staff and source of exposure) the clinical and laboratory data. It was registered the cycle threshold (CT) of the first COVID-19 PCR test performed (as part of the routine staff monitoring system) after BBF exposure.

The study was conducted with information usually collected by the quality and safety program without any patient/staff identifiers.

4. Results

In 2020 29 BBF exposure were reported. All were needlestick injuries, which means an essential increase compared to 2019 (6 incidents) and 2018 (5 incidents). During 2020 the incidence of exposure follows the number of admission of COVID-19 patients, with higher figures in June, July, and September (Figure 1).

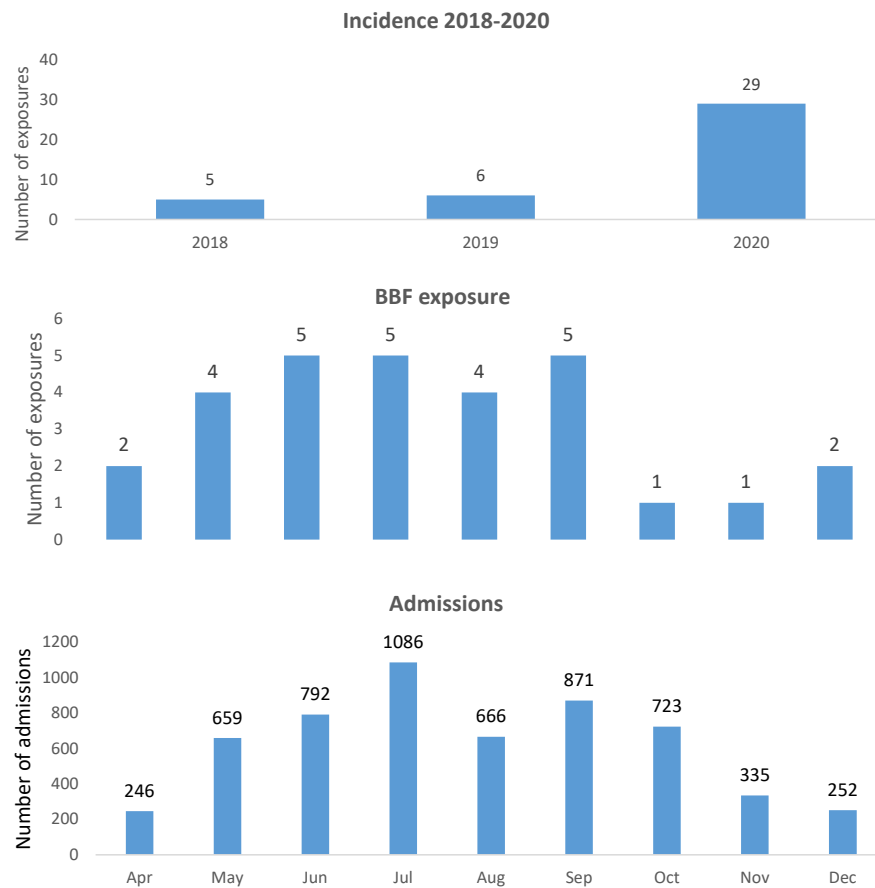


Figure 1. Blood and body fluid exposure reported by the years 2018-2020 (top), monthly April-December 2020 (middle), and admission of COVID-19 patients (bottom).

The majority of the staff exposed were female (69%) and nurses (86.2%). According to the monitoring system of staff exposure to COVID-19, no exposed staff was reported with symptoms suggestive of coronavirus infection within the two weeks after the BBF exposure. The PCR test was performed on 25 out of 29 staff after exposure and 56% within the 14 days after exposure, showing negative results. It was identified the source of the exposure (COVID-19 patient) in 17 staff (58.6%) with time from patient symptoms onset to staff exposure of 14 days (standard deviation 7.14 days) and a CT value of 24.6 (standard deviation 4.9) (Table 1).

5. Discussion

Our study describes the increased incidence of BBF exposure during COVID-19 and the lack of data to support the transmission by exposure to blood after needlestick injuries in healthcare workers.

The incidence of BBF exposure increased significantly during 2020 with higher reporting during the pandemic’s peak, which is related to the staff coverage and the stressful conditions, among other factors.^{7,8} However, two additional factors should be highlighted. First, the need to hire staff from overseas to cover the emergency has limited training in the prevention of BBF exposure, despite the initial infection control training provided upon arrival. Second, the risk associated with the temporal settings (e.g., tents) where alternative procedures were implemented for staff

Table 1. Characteristics of Staff Exposed to Blood and Body Fluid and Source of the Exposure

Variables	Result
Staff exposed	
Sex	
Female	20 (69%)
Male	9 (31%)
Age [mean (standard deviation)] (years)	45.7 (7.1)
Category	
Nurse	25 (86.2%)
Housekeeping	2 (6.9%)
Physician	1 (3.4%)
Ancillary	1 (3.4%)
Time from exposure to PCR test	
mean (standard deviation)	14 (9.4)
min; max	2;31
Source of the exposure	
Known source	17 (58.6%)
The time between staff exposure and symptom onset in the source (days)	
mean (standard deviation)	14 (7.14)
Min; max	4; 26
PCR cycle threshold value	
Mean (standard deviation)	24.6 (4.9)
Min; max	15.51; 60.4

traffic, waste management, and other required facilities to provide patient care.^{9,10}

COVID-19 was not confirmed in the staff after the exposure using symptoms monitoring and lab test (in selected cases). Nevertheless, most of the exposure occurs during a probable low viremia in patients (10 days after symptoms onset in the source). According to several studies, the virus can be detected in serum or plasma. However, there is limited evidence of transmission through blood or blood products because of the short blood phase of the SARS-CoV-2 and the low infectiousness of the identified virus.¹¹⁻¹³ Similarly, after transplantation with COVID-19 patients, no evidence of transmission was reported.¹⁴

This study is limited because it is a single-center design that interferes with the comparison with others facilities. Therefore multicenter studies in COVID-19 facilities are required to assess the magnitude of the problem. Besides, the low number of exposure reported limits identifying the likely association in the SARS-CoV-2 transmission.

6. Conclusion

The increased risk of BBF exposure during the pandemic provides insight into the need to review occupational exposure prevention practices during pandemics. However, additional studies are required to define the risk of COVID-19 related to occupational exposures to BBF.

Authors' Contributions

HGG: research design, writing, revision, and approval of the final text of the article. AVA: drafting, review, and approval of the final text of the article. The authors participated in discussing the results, and we have read, reviewed, and approved the final text of the article.

Conflict of Interest Disclosures

The authors declare that they have no conflict of interest.

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