Environmental contamination with SARS-CoV-2 in Hospitals

Zeeshan Afzal, Sumit Kumar, Sophie Tucker, Robin Lucas-Evans, Asghar Dayala, Dennis Mlangeni

Peterborough City Hospital, North West Anglia NHS Foundation Trust, United Kingdom

SAGES 2022
DENVER, CO

NHS
North West Anglia
NHS Foundation Trust



Introduction:

- The COVID-19 (SARS-CoV-2) pandemic is a global concern, and it has changed the way we practice medicine in acute hospital settings. Transmission of SARS-CoV-2 is primarily through inhalation of respiratory droplets generated however there's a potential risk that respiratory droplets settling on inanimate surfaces and objects in the hospital environment could provide a reservoir for nosocomial infections in patients and pose a health care risk to medical staff.

- There have been previous reports of healthcare- associated outbreaks in hospitals. However, its not clear what proportion of SARS-CoV-2 infections are attributable to direct contact with fomites

- Environmental contamination with SARS-CoV-2 in healthcare institutions has been shown to vary according to the function or service provided by a unit or department. Information that identifies hospital areas that have a propensity for higher environmental burden may inform the practice of Infection Control and environmental cleaning and decontamination in healthcare institutions.

Aims and Objectives:

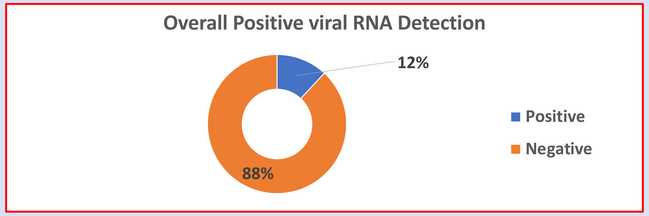
- To investigate environmental SARS-CoV-2 contamination in the clinical areas of patients with COVID-19 infections.

Materials and Methods:

- We conducted longitudinal swabbing of frequently touched surfaces, equipment and ventilation ducts in 5 specific clinical areas

  - Emergency Department
  - Intensive Care Unit
  - Isolation Ward
  - Respiratory Ward
  - Gastroenterology Ward

- These wards were receiving areas for COVID suspected patients at the height of the second COVID-19 infection wave in the UK
- Surfaces to be swabbed were divided into patient zone, doctor zone and nursing zone.
- Swabs from the chosen surfaces were collected on two consecutive days.
- A total of 158 surface swabs were collected during the second wave of the COVID-19 pandemic. S
- ARS-CoV-2 RNA was detected by reverse transcription polymerase chain reaction (RT-PCR).



Patient zone	Doctor zone	Nursing zone
Bed rails	Computer keyboard	Computer keyboards
Oxygen saturation probe	Telephones	Monitors
Ventilation grill	Table surfaces	Table surfaces
Bedside table		
Bed control device		
Television remote control	Other zone	
TV screen	Arterial blood gas machine	
Door handle	Exit doors	

Table 1 Environmental surfaces used for swab collection

Ward		Day of positive viral detection
Isolation Ward		
• **Patient zone**	Bed rails	2
	Bed control	1
	Bedside table	1
	TV screen	2
	TV remote	1
	Ceiling ventilation grill	2
• **Doctor zone**	Office desk surface	2
• **Other zone**	Mobile ward computer	2
Respiratory ward		
• **Patient zone**	Bed control device	2
Gastroenterology Ward		
• **Patient zone**	Celling Ventilation grill	1
• **Nursing zone**	Office desk surface	2

Table 2 Environmental surfaces with positive viral RNA detection

Results:

- The most contaminated clinical areas were the three receiving wards where 12 % (11/96) of the swabs were positive.
- Inside the patient rooms these surfaces included bed rails and controls, bedside tables, television screens, remote control units, and the room ventilation system.
- Outside the patient room these surfaces included mobile computer and computer desk surfaces in the doctors' office.
- All swabs taken from the Emergency department and Intensive care unit were found to be negative.

Conclusions:

Our study confirms the evidence of potential infection risks posed by environmental contamination with SARS-CoV-2 virus. This highlights the importance of adequate environmental cleaning for proper Infection Control and Prevention in healthcare settings.