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Morning Brief :
Scientific Review

16 April

The purpose of the Morning Brief is to **summarise** and present key information, research articles and other relevant publications pertaining to critical care and COVID-19. We aim to prioritise information, articles and publications released in the preceding 24-48 hours.

Stellenbosch University Research Response Team

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Content

- World update
- Summary of selected relevant and recent articles
- Environmental and personal protective equipment (PPE) swabs to determine **extent and patterns of contamination** of viral RNA in patient care environment

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World Update

>2 million confirmed COVID19 cases worldwide
>500 000 people have recovered
>120 000 deaths
One third of all cases are in the USA

Total Confirmed

2,006,513

Confirmed Cases by Country/Region/Sovereignty	
609,995	US
177,633	Spain
162,488	Italy
132,553	Germany
131,365	France
99,455	United Kingdom
83,355	China

Total Deaths

128,886

21,067 deaths	Italy
18,579 deaths	Spain
15,729 deaths	France

Graphics Source: Johns Hopkins Coronavirus Resource Centre https://coronavirus.jhu.edu/map.html Accessed 15 April 2020

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Articles of interest

Original Article

Escalating infection control response to the rapidly evolving epidemiology of the coronavirus disease 2019 (COVID-19) due to SARS-CoV-2 in Hong Kong

Letters

RESEARCH LETTER

Air, Surface Environmental, and Personal Protective Equipment Contamination by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) From a Symptomatic Patient

LETTERS | 1 APRIL 2020

Environment and Personal Protective Equipment Tests for SARS-CoV-2 in the Isolation Room of an Infant With Infection

FREE

*Chee Fu Yung, MBChB; Kai-qian Kam, MBBS; Michelle S.Y. Wong, PhD; Matthias Maiwald, MD; Yian Kim Tan, PhD; Boon Huan Tan, PhD *; Koh Cheng Thoon, MBBS **

March 2020 , pp. 1-6

Access

Absence of contamination of personal protective equipment (PPE) by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2)

Sean Wei Xiang Ong (a1) (a2), Yian Kim Tan (a3), Stephanie Sutjipto (a1) (a2), Po Ying Chia (a1) (a2) (a4) ...

DOI: https://doi-org.ez.sun.ac.za/10.1017/ice.2020.91 Published online by Cambridge University Press: 26 March 2020

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Environmental contamination and potential for transmission from an infant with COVID-19.

LETTERS | 1 APRIL 2020

Environment and Personal Protective Equipment Tests for SARS-CoV-2 in the Isolation Room of an Infant With Infection FREE

*Chee Fu Yung, MBChB; Kai-qian Kam, MBBS; Michelle S.Y. Wong, PhD; Matthias Maiwald, MD; Yian Kim Tan, PhD; Boon Huan Tan, PhD *; Koh Cheng Thoon, MBBS **

Case:
6 month old infant, one episode of fever, no respiratory symptoms or signs, admitted for isolation
Nasopharyngeal swab PCR pos, stool and urine negative

Samples:
The infant's isolation environment:

- Patient's bedding
- Cot rail
- Table situated 1 meter away from the infant's bed

Personal protective equipment (PPE) of a health care worker (HCW) who was looking after the infant:

- HCW's face shield
- N95 mask
- Waterproof gown

Each swab was run over nearly 100% of the item or area.

Study design and methods:
Observational study, small number of swabs taken from 1 room and 1 HCW
No controls

Results:
All 3 samples from the HCW's PPE negative.

The infant's bedding, the cot rail, and a table situated 1 meter away positive. Similar quantitative results reflecting viral load for all surfaces.

The investigation confirmed that a generally well infant with COVID-19 can contaminate the environment with PCR-detectable virus.
Despite close physical contact with the infant during feeding, no evidence of SARS-CoV-2 on the gown of the HCW.

Limitations:
Only one patient and HCW, no positive or negative controls

Yung C, et al. 2020. Environment and Personal Protective Equipment Tests for SARS-CoV-2 in the Isolation Room of an Infant With Infection. Annals of Internal Medicine. https://doi-org.ez.sun.ac.za/10.7326/M20-0942

RESEARCH LETTER

Air, Surface Environmental, and Personal Protective Equipment Contamination by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) From a Symptomatic Patient

Extent of air, surface environmental, and personal protective equipment contamination by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) from symptomatic patients

Cases:

3 symptomatic patients, all with cough, but not severe disease

Samples:

26 sites (Including the PPE of study physicians) in airborne infection isolation rooms (12 air exchanges per hour) with anterooms and bathrooms

5 times altogether, over a 2-week period

Air sampling was done for the isolation room and anteroom

Study design and methods:

Observational study, moderate number of swabs

No controls

Results:

Positive: Toilet bowl, sink, air exhaust outlets, shoe cover of physician

Negative: all other PPE samples, air samples, all samples that were taken after routine cleaning, anteroom and corridor sampl

Limitations:

Small number of patients, no positive or negative controls

Ong SWX, et al. 2020. Air, Surface Environmental, and Personal Protective Equipment Contamination by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) From a Symptomatic Patient. JAMA. 10.1001/jama.2020.3227

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March 2020 , pp. 1-6 Access

Absence of contamination of personal protective equipment (PPE) by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2)

Sean Wei Xiang Ong [a1] [a2], Yian Kim Tan [a3], Stephanie Sutjipto [a1] [a2], Po Ying Chia [a1] [a2] [a4] ...

DOI: https://doi-org.ez.sun.ac.za/10.1017/ice.2020.91 Published online by Cambridge University Press: 26 March 2020

Per contact episode risk of PPE contamination with SARS-CoV-2

Study design and methods:
Observational study
No controls

Cases:

15 patients in isolation rooms, 63% symptomatic
none requiring ventilatory support
no aerosol-generating procedures performed

Samples:

30 Health care workers upon exiting patients rooms
Swabs from the entire front of goggles, front surface of N95 respirator, and front surface of shoes

Results:

All 90 samples from 30 health care workers were negative.
Median time spent in the patient's room was 6 minutes.
Activities ranged from casual contact (e.g. administering medications, cleaning) to closer contact (e.g. physical examination, collection of respiratory samples)

Limitations:

Extraction buffers to detect virus particles may be more appropriate for sampling from N95 respirators than swabs.

Ong SWX, et al. 2020. Absence of contamination of personal protective equipment (PPE) by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). Infection Control & Hospital Epidemiology, 1-6. doi:10.1017/ice.2020.91

Original Article

Escalating infection control response to the rapidly evolving epidemiology of the coronavirus disease 2019 (COVID-19) due to SARS-CoV-2 in Hong Kong

Environmental sampling for 1 symptomatic patient

Case:
1 symptomatic patient with positive nasopharyngeal and oropharyngeal swabs

Samples:
Air samples 10 cm from patient - patient performed 4 different maneuvers (normal breathing, deep breathing, speaking "1, 2, 3" continuously, and coughing continuously) while putting on and putting off the surgical mask.
Swab samples from patient's environment - bench, bedside rail, locker, bed table, alcohol dispenser, and window bench

Results:
Air samples all negative
Window bench positive, all other samples negative

Limitations:
Only 1 patient sampled
No positive controls

Study design and methods:
Observational study
No controls

Cheng VCC, et al. 2020. Escalating infection control response to the rapidly evolving epidemiology of the coronavirus disease 2019 (COVID-19) due to SARS-CoV-2 in Hong Kong. Infection Control & Hospital Epidemiology (2020), 1–6. doi:10.1017/ice.2020.58

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Summary and overall limitations

- PCR tests from the environment of PCR confirmed Covid-19 patients, both symptomatic and asymptomatic were positive in some cases.
- PCR from PPE was positive in only one case from the overshoe of a HCW, despite relatively close physical contact with patients.
- These negative findings should be interpreted with caution however, as all the studies used a limited number of samples, and none used positive controls to exclude the possibility of sampling or testing technique errors causing negative samples.
- All samples from masks of HCWs were negative, but no comparisons were made between different techniques for isolating RNA from masks, and no positive controls were used as quality checks.
- PCR also does not distinguish between dead and live virus, although it is known that free RNA degrades quickly.

References

- Yung C, et al. 2020. Environment and Personal Protective Equipment Tests for SARS-CoV-2 in the Isolation Room of an Infant With Infection. Annals of Internal Medicine. https://doi-org.ez.sun.ac.za/10.7326/M20-0942
- Ong SWX, et al. 2020. Air, Surface Environmental, and Personal Protective Equipment Contamination by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) From a Symptomatic Patient. JAMA. 10.1001/jama.2020.3227
- Ong SWX, et al. 2020. Absence of contamination of personal protective equipment (PPE) by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). Infection Control & Hospital Epidemiology, 1-6. doi:10.1017/ice.2020.91
- Cheng VCC, et al. 2020. Escalating infection control response to the rapidly evolving epidemiology of the coronavirus disease 2019 (COVID-19) due to SARS-CoV-2 in Hong Kong. Infection Control & Hospital Epidemiology (2020), 1–6. doi:10.1017/ice.2020.58

This summary was prepared by Rudolf Boshoff (MBChB VI) and Teresa Feng (MBChB V), students at Stellenbosch University as part of the daily brief to the TBH ICU team (9 April 2020)