

利用環境採檢於醫院病房監測新型冠狀病毒

內科部

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摘要

截至2022年10月，Coronavirus disease 2019 (COVID-19) 已造成全球超過6億人確診和650萬人死亡。引起COVID-19的severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)具高度傳染性，除了經由具傳染性的飛沫和含病毒顆粒的空氣傳染之外，病毒藉由環境媒介傳播 (fomite transmission) 的風險仍有待釐清。

SARS-CoV-2的Omicron變異病毒不只廣泛在社區流行，亦很容易傳播於醫院的住院病人之間。COVID-19院內感染不但可能令確診病人無法接受適當醫療，且可能因感控措施影響其他病人的權益，因此避免SARS-CoV-2於醫院內傳播非常重要。過去已有研究顯示收治COVID-19確診病人後，病室環境表面的環境採檢有很高的SARS-CoV-2陽性率，而醫院內受SARS-CoV-2污染的環境是否可作為早期院內感染的警示，值得進一步探討。在國外的文獻，汗水監測到的SARS-CoV-2和其他病毒，可以預警接下來的病毒傳播；是否能藉由環境採檢作為預警SARS-CoV-2和其他呼吸道病毒在醫院內傳播的警示系統，目前沒有相關的文獻探討。

此計畫將透過定期的病房公共空間以及病室中針對SARS-CoV-2以及其他呼吸道病毒的核酸環境採檢結果，探討病房及病室環境受病毒污染的情形；亦將透過環境採檢結果，以流行病學的角度探討其與COVID-19群突發事件在時間和地理上的關聯性。其他的呼吸道病毒我們將先以流感為主。期能藉此發展出病房的疫情主動監測的策略，能早期發現可能潛在的院內呼吸道病毒傳播事件。

關鍵詞:嚴重特殊傳染性肺炎(COVID-19)、新型冠狀病毒(SARS-CoV-2)、環境採檢 (environmental sampling)、群突發(outbreak)、主動監測(active surveillance)

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Abstract

The Coronavirus disease 2019 (COVID-19) pandemic, caused by the highly transmissible severe acute respiratory syndrome coronavirus 2 (SARS-CoV -2), has led to enormous excess mortality and economic damage around the world. While SARS-Co V -2 is mainly transmitted by exposure to infectious respiratory fluids or inhalation of virus particles in the air, transmission from contaminated surfaces has also been suggested to be a potential route.

During the COVID-19 pandemic, SARS-Co V -2 has been spreading in both community and hospital settings. Hospital-onset SARS-CoV-2 infection not only affects individual patient management and discharge, but also interrupts the optimal management of other patients because of contact isolation and bed closures.

Therefore, the prevention of nosocomial spread of SARS-CoV-2 becomes one of the highest priorities at hospitals. Prior study showed extensive contamination of environmental surfaces by SARS-CoV-2 in hospital rooms occupied by COVID-19 patients; while wastewater surveillance has been used to detect and monitor the occurrence of SARS-Co V -2 infections at communities and hospitals, whether active surveillance could also be achieved by environmental sampling is worth exploring.

In this proposal, we plan to have surface environmental samples taken from high-touch surfaces at common areas of wards to explore possible relation between virus-contaminated environmental surfaces and hospital-based clusters or outbreaks due to COVID-19 of other respiratory virus infections. We will also evaluate the presence of SARS-CoV-2 RNA on environmental surfaces of hospital rooms occupied by patients with or without COVID-19 to assess the extent of environmental contamination caused by COVID-19 patients. Furthermore, we will determine the efficacy of different methods of disinfection by having environmental samples taken from contaminated surfaces at patient rooms after various disinfection procedures.

Through this research, we aim to develop an innovative strategy in the active surveillance of COVID-19 and other respiratory virus infections to serve as an effective alarm system at hospitals.