How Exposure to SARS-CoV-2 Varies Across Hospital Settings

New research from the UK has detected SARS-CoV-2 seroconversion among asymptomatic healthcare workers. Moreover, researchers were able to identify variation in the occupational risk of exposure to the pathogen – which causes COVID-19 – between hospital departments.

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In this cross-sectional study of 545 asymptomatic healthcare workers carried out on 24-25 April 2020, the point prevalence of SARS-CoV-2 nasopharyngeal carriage was 2.4%. In contrast, the overall seroprevalence of SARS-CoV-2 antibodies was higher (24.4%).

The study was conducted at University Hospitals Birmingham NHS Foundation Trust (UHBFT), one of the largest hospital trusts in the UK. Study participants were recruited while at work over the course of 24 hours between 24 and 25 April 2020. Initial invitation to take part in the study was made via the UHBFT social media.

For this study, participants volunteered a nasopharyngeal swab and a venous blood sample that were tested for SARS-CoV-2 RNA and anti-SARS-CoV-2 spike glycoprotein antibodies, respectively. Test results were interpreted in the context of prior illnesses and the hospital departments in which participants worked.

As noted by the researchers, seroprevalence was greatest among those working in housekeeping (34.5%), followed by those assigned in acute medicine (33%) and general internal medicine (30.3%). In comparison, lower rates of seroprevalence were observed in participants working in intensive care units (14.8%).

These findings, the researchers point out, strongly support the conclusion that differential risk of SARS-CoV-2 exposure exists within the hospital settings. Further investigation of these observations is necessary to inform future infection control and occupational health practices, the researchers add.

One possible explanation for the low seroprevalence in ICU workers is that intensive care units are designated high-risk environments, where more stringent infection control protocols are implemented, including the use of enhanced personal protective equipment (PPE) with filtered face piece (class 3) respirators.

"The contribution of enhanced PPE in protecting staff from infection with SARS-CoV-2 should be studied further, including the availability of training, space and supervision to use PPE effectively," according to the research team.

The study also found that BAME (Black, Asian and minority ethnic) ethnicity was associated with a significantly increased risk of seropositivity (OR: 1.92, 95% CI 1.14 to 3.23, p=0.01). This finding warrants further studies to determine whether the increased risk of seropositivity observed within individuals of BAME ethnicity is homogeneous throughout the individual ethnic populations that collectively constitute the BAME group, according to the researchers.

Source: BMJ

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