CREOD Research Flash

February 2018

EXPOSURE TO INFECTIOUS BIOAEROSOLS IN THE WORKPLACE: UNDERSTANDING THE RISKS TO HEALTHCARE WORKERS

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The Issue: Talking and coughing during acute respiratory infections and healthcare procedures such as bronchoscopy can introduce infectious bioaerosols into the breathing space of others close by. Aerosol-generating procedures have been highlighted as high-risk activities for healthcare workers, and caring for acute infected patients requires the use of personal protective equipment to mitigate exposure.

Before now, clinical settings had very limited access to the technical expertise and instruments needed to measure potentially infectious viral bioaerosols. For example, during the SARS outbreak, bioaerosol sampling was performed only by the Public Health Agency of Canada.

Study Goals: Our long-term goal is to contribute to accurate risk-assessment for healthcare workers who may be exposed to infectious bioaerosols. To do this, we must be able to (1) accurately measure how much viral nucleic acid is emitted and dispersed in the breathing space around infected patients and (2) determine healthcare workers' risk of exposure when performing aerosol-generating procedures.

Methods: To answer the first question, we evaluated low-volume aerosol samplers, and then used them to test the air around influenza patients. To answer the second question, we used an optical particle counter to determine the quantity and size of particles generated during elective bronchoscopy.

Results and Implications: Measurement Tools and Protocols

We have successfully established reliable sampling and detection protocols for measuring the influenza virus emitted in bioaerosols between infected patients and the breathing zones of their healthcare workers.

We have also successfully designed an effective protocol for counting respirable particles in the air during aerosol-generating procedures.

We now have local expertise and the potential to train more qualified personnel from other jurisdictions to use these tools to detect potentially infectious viral bioaerosols in the clinical setting.

Results and Implications: Risk to Healthcare Workers

These results have implications for the health and safety of healthcare workers providing care for infectious patients, as well as for pandemic planning and response to novel and emerging pathogens.

By better understanding the risk, the occupational health and safety system can plan more targeted and effective use of preventative measures.

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