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EDITORIAL

# Different location, same results?

**Key words:** bronchoscopy, immunosuppressed, influenza, pneumonia, respiratory infections.

**Abbreviations:** BAL, bronchoalveolar lavage; NP, nasopharyngeal; PCR, polymerase chain reaction; RSV, respiratory syncytial virus; RVP, respiratory viral panel.

Determining the aetiology of respiratory complaints in immunosuppressed patients is a serious matter. Neutropenic fever in cancer patients is associated with an in-hospital mortality of 9.5%.[1] Respiratory viral infections after haematopoietic stem cell transplantation may lead to worse outcomes.[2] Establishing a prompt diagnosis leads to expedited treatment with appropriate antimicrobials and avoidance of complications associated with unnecessary diagnostic testing and treatment-related toxicities.

Bronchoscopy is a valuable instrument in the evaluation of pulmonary infiltrates of unknown aetiology in immunocompromised patients. Although it is well tolerated by most patients, it is not a benign procedure with potential complications including hypoxaemia, bleeding and pneumothorax.[3] Knowing which patient's bronchoscopy is most likely to benefit is of key importance to clinicians. While imaging can give some clues to the potential diagnostic yield of bronchoalveolar lavage (BAL),[4] non-invasive laboratory testing is tremendously valuable. In many patients, bronchoscopy is only entertained after non-invasive testing, such as nasopharyngeal (NP) respiratory viral panel (RVP), has been performed.

Use of PCR assays to identify community-acquired respiratory viruses has improved sensitivity compared with conventional viral cultures.[5] RVP-PCR can be performed as an aspirate, wash or swab of the nasopharynx and is commercially available from multiple vendors. What remains unknown is the ability of an NP RVP-PCR to detect viral infection involving the lower respiratory tract. Sparse data currently exist showing variable clinical correlation between NP RVP-PCR and BAL RVP-PCR obtained in the same patients.[6–8]

In the accompanying article, Lachant *et al.*[9] sought to evaluate the findings of NP RVP-PCR compared with BAL RVP-PCR. The researchers performed a retrospective chart review of adult immunosuppressed patients who had BAL and NP RVP-PCR performed within 7 days of each other. They were able to identify 89 patients who met these criteria over a 5-year period at a single university medical centre. This institution employed the FilmArray (Biofire Diagnostic Inc, Salt Lake City, UT, USA) multiplex PCR, an assay which detects adenovirus, coronavirus (four strains), human metapneumovirus, rhinovirus, influenza A/B, respiratory syncytial virus (RSV), parainfluenza virus, *Mycoplasma pneumoniae*, *Chlamydia pneumoniae* and *Bordetella pertussis*. The patients had a median time duration between NP and BAL testing of 2 days, and 31 of 89 patients had viruses identified on testing.

The primary finding of this study was concordance between NP and BAL RVP-PCR testing of 89%, with a false negative rate of NP RVP-PCR of 8%. Of the 10 patients with discordant tests, 7 had a negative NP RVP-PCR with a positive BAL RVP-PCR, with influenza not identified in 2 patients on their NP specimens. A secondary finding was an increased chance of having positive BAL RVP-PCR in patients during the winter months and in recipients of allogeneic haematopoietic stem cell transplantation.

These findings support the first-line use of NP RVP-PCR in immunosuppressed patients presenting with respiratory symptoms. Additionally, if there is a low pretest probability for respiratory infection, these tests may reduce the need for invasive testing. Obtaining a positive NP finding may expedite treatment for respiratory viral infections such RSV or influenza, which have significant risk for morbidity in this patient population and effective treatments available. Based on this, it seems reasonable to recommend NP RVP-PCR prior to performing bronchoscopy with BAL when respiratory viral infection is suspected. However, the clinician must respect the risk for false negative NP RVP-PCR testing and pursue further testing, including BAL, when the clinical suspicion is high.

This study has many limitations, which the authors acknowledge readily. The small number of patients obtained retrospectively in an observational manner offers significant limitations. The non-uniform times between obtaining the NP and the BAL samples also present a challenge, as the duration of viral shedding from the respiratory tract likely varies from patient to patient. It is likely that some of these false negative NP RVP-PCRs were due to prolonged time between obtaining NP and BAL samples. Additionally, given the highly sensitive nature of PCR studies, it is probable that non-clinically relevant viruses were discovered. How these positive results should be interpreted is unknown.

This study adds to the body of literature in interpretation of RVP-PCR in immunosuppressed patients with respiratory illnesses. There is a good correlation between tests obtained from the NP as compared with BAL fluid, although false negatives do exist. Ultimately, the clinician must remain agile in interpreting newly available diagnostic assays.

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