

***Mycoplasma Pneumoniae* Infection in Patients with Ventilator-Associated Pneumonia and ARDS**

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Hypothesis:

Use of Community Acquired Respiratory Distress Syndrome (CARDS) Toxin-based assays will result in increased detection of *Mycoplasma pneumoniae* among mechanically ventilated ICU patients.

Specific Aims:

- 1 – Determine the incidence of *M. pneumoniae* in mechanically ventilated ICU patients undergoing bronchoscopy.
- 2 – Determine which factors (clinical or laboratory) may be predictive of infection with *M. pneumoniae*

Background:

Due to the difficulty in isolating *M. pneumoniae* by standard culture techniques, it is not typically tested for in the ICU. Casalta et al. have reported 6 cases of ventilator-associated pneumonia (VAP) due to *M. pneumoniae* (Casalta 1996, La Scola 2004). There has been one prospective study using the older P1-adhesin PCR to assess for *M. pneumoniae* in patients with suspected VAP; they found positive results in 3% of subjects (Apfalter 2005). The true incidence of *M. pneumoniae* in ICU settings and its contribution to pulmonary pathology remains unknown. Assays targeting the recently identified CARDS toxin virulence factor provide a novel diagnostic modality which may aid in the diagnosis of *M. pneumoniae* in the ICU (Kannan and Baseman, 2006).

Study Design and Conduct:

This is a prospective observational study enrolling mechanically ventilated patients in the SICU. Subjects will be enrolled at the time of bronchoscopy with bronchoalveolar lavage (BAL) fluid collection for the diagnosis of VAP. BAL fluid and serum will be collected at that time. Clinical, laboratory, and demographic information will also be collected on each subject. If subjects undergo repeat bronchoscopy for an exacerbation of respiratory dysfunction, additional BAL and serum samples will be collected. Additionally, serum samples will be collected every two weeks while subjects remain in the ICU. BAL fluid will be cultured for *M. pneumoniae*, and immunofluorescence assays will be used to localize the organism. BAL fluid and serum will be tested for *M. pneumoniae* using PCR assays against both CARDS Toxin and P1-adhesin. Blood will be tested for the presence of CARDS Toxin and P1-adhesin antibodies to *M. pneumoniae* using ELISA. BAL will be tested for CARDS Toxin proteins using antigen capture assays. Subjects who are positive for *M. pneumoniae* will be compared to those who test negative, and potential clinical variables will be investigated to determine which factors are associated with mycoplasma infection.

References

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- Kannan TR and Baseman JB. ADP-ribosylating and vacuolating cytotoxin of *Mycoplasma pneumoniae* represents unique virulence determinant among bacterial pathogens. *Proceedings of the National Academy of Sciences of the United States of America.* 2006; 103(17): 6724-6729.