

Title: Prospective Viral Recovery and Concordance Between Nasopharyngeal & Bronchoalveolar Lavage Specimens In Pediatric Lung Transplant

Lara Danziger-Isakov¹, G Storch², R Buller², S Mason², S Worley¹, C Conrad³, A Faro², S Goldfarb⁴, D Hayes Jr⁵, M Schecter⁶, H Spencer⁷, G Visner⁸, N Williams⁹, D Ikle¹⁰ and S C Sweet².

¹Cleveland Clinic; ²Washington Univ.; ³Lucile Packard Children's; ⁴Children's Philadelphia; ⁵Nationwide Children's; ⁶Texas Children's; ⁷Great Ormond Street; ⁸Children's Boston; ⁹NIH and ¹⁰RHO Inc.

Respiratory viruses have been linked to bronchiolitis obliterans syndrome in lung transplant. Prospective epidemiology of respiratory viral infections and correlations between specimen sources have not been reported in pediatric lung transplant recipients (PLTRs).

Methods: As part of the Clinical Trials in Organ Transplantation in Children (CTOT-C) of PLTRs, prospective serial nasopharyngeal (NP) and bronchoalveolar lavage (BAL) specimens were interrogated by multiplex PCR (Luminex xTAG) that identifies 17 viruses but does not differentiate enterovirus from rhinovirus. Concordance of NP and BAL was evaluated by McNemar's test and kappa.

Results: 31 patients had 1-13 virology records, for a total of 203, of which 141 had both NP and BAL. 37 records came from symptomatic episodes (22 positive, 59%) and 166 came from planned visits (28 positive, 17%). Study data has not been integrated; planned visits may have been symptomatic. There were 50 episodes in 23 patients (mean episodes/pt 2.2, range 1-7, 52% w/1 episode) in which NP and/or BAL samples were positive. Median time for virus-positive specimens was 65 days posttxp (range 1-599). Rhino/enterovirus was recovered most frequently (40 episodes) compared to coronavirus (3), hMPV (1), influenza (2), RSV (2), adenovirus (1), parainfluenza (1). Rhino/enterovirus occurred throughout the year but the other viruses were detected in winter/spring. Eight episodes were detected in BAL only, 32 in NP only, and 10 in both (same virus in all 10 cases). NP was positive in 19 specimens for which the paired BAL was negative; BAL was positive in 4 specimens with a negative NP (kappa=0.38). NP was significantly more likely to detect a virus than BAL at all visits (P=0.004) or at protocol visits (n=128 visits, P=0.010) but not at symptomatic visits (n=13 visits, P=0.37).

Conclusions: Respiratory viruses are common, occur in 74% of PLTRs and follow typical seasonality with rhino/enteroviruses most frequent. Further study is needed to determine the impact of viral upper respiratory tract infection on graft function (particularly where paired BAL is negative) and is a primary aim of the CTOT-C study.