Utility of a RSV Rapid Diagnostic Assay in Hospitalized Children in Amman, Jordan

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Abstract:

Background: RSV infection is a leading cause of lower respiratory tract infection worldwide and the use of rapid diagnostic assays could identify RSV-infected children during hospitalization.

Objective: To determine the utility of a RSV rapid diagnostic assay in hospitalized children in Amman, Jordan.

Methods: We conducted a prospective year-round viral surveillance study in children <2 years of age admitted with respiratory symptoms and/or fever at the government-run hospital, Al-Basheer. Surveillance was conducted Sunday-Thursday from March 2010-November 2011. Nasal/throat swabs were collected, placed into lysis buffer, aliquoted, and frozen at -80°C. Specimen aliquots were shipped to Vanderbilt and tested by real-time RT-PCR for respiratory syncytial virus (RSV), metapneumovirus (HMPV), rhinovirus (HRV), influenza A and B, and parainfluenza virus 3 (PIV3). RSV rapid diagnostic assays (RDA) were done during selected months (October-May). Clinical data are compared using Wilcoxon rank sum tests.

Results: Total of 674 subjects had both a RSV RDA and RT-PCR performed. The median age was 4.20 months, 57.7% males, 75.4% were exposed to smoke, 42% had antibiotics prior to hospitalization, and 86.7% were administered antibiotics during their hospitalization. The most common diagnoses were bronchopneumonia (37.7%), bronchiolitis (24.8%), and rule out sepsis (19.4%). Ninety-six children had a positive RSV RDA and 395 subjects had RSV detected by RT-PCR. Using RT-PCR as the gold standard, the sensitivity and specificity of the RSV RDA were 24% (94/395) and 99% (277/279) with positive and negative predictive values of 98% (94/96) and 48% (277/578), respectively. RT-PCR
positive children who had shorter duration of symptoms prior to admission (mean 3.4 days vs 4.3, p=0.042) and those who had less number of cycles to detect PCR (mean 24.1.6 vs 28.9, p<0.001) were more likely to have positive RSV RDA; we did not detect an association between antibiotic use during hospitalization and sensitivity of RSV RDA (p=0.111). The antibiotic use during hospitalization was similar between those with RSV infection and those without (p=0.717).

**Conclusion:**
RSV RDA had high specificity and PPV; however, the use of RT-PCR is warranted to determine the true burden of RSV disease. The use of RSV RDA for early detection of RSV may help reduce antibiotic use during hospitalizations.