2630. Treatment of RSV Lower Respiratory Tract Infection in Two Immunocompromised Children with Polyclonal Immunoglobulin Containing Standardized Levels of Neutralizing Anti-RSV Antibody

Emily Ruth. Levy, MD; Theresa Madigan, MD; Matthew Binnicker, PhD / Microbiology; Jimmy mond, MD,PhD; W Charles Huskins, MD, MSc; Mayo Clinic, Rochester, Minnesota; ADMA Biologics, Boca Raton, Florida

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Background: Respiratory syncytial virus (RSV) can cause severe lower respiratory tract infection (LRTI) in immunocompromised children. There is no standard effective treatment, though ribavirin (inhaled or oral), pooled human intravenous immunoglobulin (IVIG), and monoclonal anti-RSV antibody (palivizumab) have been described. RI-002 (ADMA Biologics Inc.) is a pooled human polyclonal IVIG that contains standardized levels of neutralizing anti-RSV antibodies. It was recently FDA-approved for prophylaxis in primary immunodeficiency patients and has been used as compassionate treatment for RSV LRTI in stem cell transplant patients.

Methods: Two children with T-cell lymphoblastic lymphoma, both undergoing delayed intensified chemotherapy, were diagnosed with RSV LRTI. They were both treated with RI-002 under an emergency FDA Investigational New Drug protocol.

Results: Patient 1, a 4-year-old boy, was admitted with fever, neutropenia and nasal congestion, and diagnosed with RSV infection on hospital day (HD) 5. On HD17, he was intubated for respiratory failure. IVIG, palivizumab, and daily oral ribavirin were administered. On HD18, he required high frequency oscillator ventilation, nitric oxide, and paralysis. He was given RI-002 (1.5 g/kg on HD20 and 0.75 g/kg on HD22). He was placed on veno-venous extracorporeal membrane oxygenation (ECMO) on HD23. RSV PCR crossing point (Cp) values trended higher, but remained positive (table). On HD33, RI-002 was re-dosed (0.75 g/kg). Pulmonary compliance and chest CTs improved (figure). On HD52, ECMO support was discontinued. He was discharged on HD88, and currently has no signs of respiratory support. Patient 2, a 5-year-old boy, was admitted with fever, neutropenia, nasal congestion, cough, and stridor and diagnosed with RSV infection (HD1). He required cannula oxygen. IVIG and daily oral ribavirin were administered. He was given RI-002 (1.5 g/kg on HD3 and 0.75 g/kg on HD5). By HD5, he was afebrile; oxygen was discontinued. He was discharged HD6.

Conclusion: Human polyclonal IVIG containing standardized levels of neutralizing anti-RSV antibodies may be useful in the treatment of RSV LRTI in immunocompromised children. Future studies on the role of RI-002 in treatment of RSV infection in immunocompromised children are warranted.

Table: Microbiology data and PCR Crossing Point (Cp) Values from Patient 1

| Hospital Day (HD) | RI-002 treatment | Specimen type | RSV PCR Result | RSV PCR Cp* | Viral Culture |
|------------------|------------------|--------------|----------------|-------------|--------------|
| HD5              | NSwab            | Positive     | n/a            | n/a         | n/a          |
| HD10             | BAL              | Positive     | 21.1 RSV positive |             |              |
| HD17             | BAL              | Positive     | 23.2 RSV positive |             |              |
| HD20             | 1.5kg            |              |                |             |              |
| HD22             | 1.75kg           |              |                |             |              |
| HD24             | BAL              | Positive     | 29 No growth   |             |              |
| HD26             | NSwab            | Negative     | n/a            | n/a         |              |
| HD29             | ETT Aspirate     | Positive     | 33.8 No growth |             |              |
| HD33             | ETT Aspirate     | Positive     | 35.7 No growth |             |              |
| HD37             | NSwab            | Negative     | n/a            | n/a         |              |

*PCR Cp values are a semi-quantitative determination of strength of positivity
NP, nasopharyngeal; BAL, bronchoalveolar lavage; ETT, endotracheal; n/a, not available; Cp, crossing point

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2631. Influenza Associated Intensive Care Unit Hospitalizations and Deaths in Children, During 2010–2019 in Greece

Anastasia Andropoulos, Health Visitor; Elisavet Mouratidou, RN; Alexandra Vernardaki, BSc; Kassiopi Gkolfinopoulou, MPH, PhD; Takis Panagiotopoulos, PhD; Athanasios Kosssyak, PhD; Maria Exindari, MD, PhD; Andreas Mentis, MD; Anna Papa, MD, PhD; Maria Theodoridou, MD, PhD; Theano Georgakopoulou, MD, MPH, MSc; National Public Health Organization, Athens, ND; Greece; Athens Medical School, and National and Kapodistrian University of Athens, Athens, Attiki, Greece; National Public Health Organization, Athens, Attiki, Greece; National Public Health Organization, Athens, Attiki, Greece; National School of Public Health, Athens, Attiki, Greece; Hellenic Pasteur Institute, Athens, Attiki, Greece; School of Medicine, Aristotle University of Thessaloniki, Thessaloniki, Thessaloniki, Greece; Hellenic Pasteur Institute, Athens, Attiki, Greece; National Public Health Organization, Athens, Attiki, Greece

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Background: The clinico-epidemiological characteristics of children with severe influenza related intensive care unit (ICU) admissions in Greece during 2010–2019 are described.

Methods: All laboratory-confirmed influenza cases (real-time PCR), in children 0–16 years old, admitted to Pediatric ICUs throughout the country, are reported using a mandatory notification system to the National Public Health Organization of Greece. Case fatality rates (CPR) were analyzed according to age and presence of comorbidities.

Results: From October 2010 to April 2019, 131 influenza cases (n=72/100,000 children, 65 (49.6%) girls) with PICUs admissions were recorded. The majority of cases (n = 78; 60%) occurred in the age group 0–4 years old (31 (24%) children were < 1 month old and 47 (36%) children were >1 month–16 years). Seventy-five (57.2%) children required invasive ventilation. Influenza A accounted for 102 (77.86%) of cases; out of 86 (84.31%) subtyped, 68 (79%) were A/H1N1pdm09, and 18 (21%) were A/H3N2. Influenza B accounted for 29 (22.13%) of cases. All children received oseltamivir. Median length of stay was 10 days (range 1–90). A total of 32 deaths was recorded (CPR 24.4%, total rate: 1.76/100,000 children); 13 (40%) deaths occurred in children with no known comorbidities (40% viral, 7% bacterial). Seventy-five (57.2%) children required invasive ventilation. Influenza A accounted for 102 (77.86%) of cases; out of 86 (84.31%) subtyped, 68 (79%) were A/H1N1pdm09, and 18 (21%) were A/H3N2. Influenza B accounted for 29 (22.13%) of cases. All children received oseltamivir. Median length of stay was 10 days (range 1–90). A total of 32 deaths was recorded (CPR 24.4%, total rate: 1.76/100,000 children); 13 (40%) deaths occurred in children with no known comorbidities (40% viral, 7% bacterial). Seventy-five (57.2%) children required invasive ventilation.

Conclusion: AH1N1pdm09 accounted for the vast majority of severe cases and influenza associated deaths in children in Greece over the last 10 years. Severe disease occurred also in children with no comorbidities. Longitudinal clinico-epidemiological data should be considered in shaping the national immunization program.

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2632. Cord Blood Vitamin D and Maternal Vaccination Status Associated with Decreased Laboratory Confirmed Influenza Infections in Infants

Kristina Betz, MD, PhD; Matthew Fenchel, MS; Mark C. Steinhoff, MD; Elizabeth P. Schlaudecker, MD, MPH; Cincinnati Children's Hospital Medical Center, University of Cincinnati College of Medicine, Cincinnati, Ohio

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Background: Maternal influenza vaccination has been demonstrated to reduce influenza infections in infants. Influenza infections generally peak during the winter season, and several studies support the association between low levels of vitamin D and increased infections and respiratory disease, 12 congenital syndromes, 7 cancer, 5 chronic respiratory, 19 other). The most common diagnosis was febrile ARDS and 67 (51.4%) had severe pneumonia (40% viral, 7% bacterial). Seventy-five (57.2%) children required invasive ventilation. Influenza A accounted for 102 (77.86%) of cases; out of 86 (84.31%) subtyped, 68 (79%) were A/H1N1pdm09, and 18 (21%) were A/H3N2. Influenza B accounted for 29 (22.13%) of cases. All children received oseltamivir. Median length of stay was 10 days (range 1–90). A total of 32 deaths was recorded (CPR 24.4%, total rate: 1.76/100,000 children); 13 (40%) deaths occurred in children with no known comorbidities (40% viral, 7% bacterial). Seventy-five (57.2%) children required invasive ventilation. Influenza A accounted for 102 (77.86%) of cases; out of 86 (84.31%) subtyped, 68 (79%) were A/H1N1pdm09, and 18 (21%) were A/H3N2. Influenza B accounted for 29 (22.13%) of cases. All children received oseltamivir. Median length of stay was 10 days (range 1–90). A total of 32 deaths was recorded (CPR 24.4%, total rate: 1.76/100,000 children); 13 (40%) deaths occurred in children with no known comorbidities (40% viral, 7% bacterial). Seventy-five (57.2%) children required invasive ventilation.

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