Use of ASCENIV in a Young Male with Immune Abnormalities and Multiviral-Induced Respiratory Failure

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Summary

• A 15-month-old male with chronic Respiratory Syncytial Virus (RSV) infection presented with multiviral bronchiolitis and acute hypoxic respiratory failure.
• RSV, rhinovirus, and enterovirus were detected from nasopharyngeal swab.
• Immune evaluation demonstrated progressive T- cell lymphopenia and specific antibody deficiency (SAD).
• Standard immune globulin intravenous (IvIg) was initiated followed by ASCENIV, which led to rapid improvement of his clinical course.

Clinical Case

Clinical History:
- Previously healthy, fully immunized
- One bilateral ear infection
- Frequent respiratory viral infections
- Diagnosed at 11 months with chronic RSV, never completely recovered (intermittent fever, hypoxia, and increased work of breathing)

Presentation:
- Significant respiratory distress, grunting
- Hypoxic with an SpO2 of 88%

Clinical Course Timeline

Day 1: Intubated and admitted to PICU

Day 2: Initiation of high-dose IV steroids

Day 6: Initiation of High frequency oscillatory ventilation (HFOV) and nitric oxide

Day 8: Immune work-up with T-cell lymphopenia (CD3- 607/ CD4- 322 cells/µL) and absent pneumococcal titers

Diagnosed with/treated for superimposed bacterial and ventilator associated pneumonia, received PJP prophylaxis

Day 17: Progressive T-cell decline (CD3- 306/ CD4- 132 cells/µL)

Day 18: Administration of **conventional IvIg** (0.5 g/kg)

Day 19: Slight clinical improvement, continued viral positivity

Day 21: Administration of **ASCENIV** (0.5 g/kg)

Day 23: Transitioned off HFOV

Day 28: Complete viral clearance

Day 19 — RSV positive → Day 28 — RSV negative

Hospital Day	Day 1	Day 8	Day 19 (status post standard IVIG)	Day 28 (status post ASCENIV)	Day 34
RSV Rhino/Enterovirus	+ +	- +	+ +	- N/A	- -

ASCENIV Information

- Novel IvIg product approved in 2019 with unique composition
- Contains high-titer neutralizing anti-RSV antibodies (1.9-fold compared to conventional IvIg) [1-2]
- Enriched for antibodies to several other viral pathogens approved for adults and adolescents ≥12 years with primary immunodeficiency.
- The safety and effectiveness of ASCENIV has not been well studied under 3 years of age [3-4].
- A case series reviewed two patients who were ≤5 years with RSV bronchiolitis that received ASCENIV in the intensive care setting and subsequently fully recovered from their illness [5].

Discussion

• Due to the severity of clinical decompensation secondary to chronic multiviral bronchiolitis, this case should raise concern for primary immunodeficiency.
• This unique presentation propelled the clinical team to pursue ASCENIV (after conventional IvIg) for the treatment of severe multiviral infection in an immune deficient patient.
• This case suggests the benefits of ASCENIV were revealed in a young patient with PI that is within this less studied age cohort.

References

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