CASE STUDY

97. Critical Role of Multiplex PCR in Diagnosing Legionella-SARS-CoV-2 Co-infection in a Severely Immunosuppressed Pregnant Patient: A Case Report

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Background: The pregnancy period is characterized by significant immunological shifts, creating a window of vulnerability to severe infections. This susceptibility is profoundly amplified in patients with iatrogenic immunosuppression, such as those receiving biologic therapy for inflammatory bowel disease. Sepsis in these patients presents important diagnostic and therapeutic challenges, as both common pathogens and atypical co-infections must be considered. Co-infection with Legionella pneumophila, a potent intracellular bacterium, and SARS-CoV-2, a virus known for inducing immune dysregulation, is exceptionally rare and can precipitate a life-threatening hyperinflammatory state.

The Case: We present a case of severe septic shock and acute respiratory failure resulting from this unusual dual infection in a uniquely compromised host. A 31-year-old female, 35 weeks pregnant, presented in ER with fever, dyspnea and altered general state, rapidly progressing to septic shock despite the broad spectrum antibiotic therapy initiated at admission. Her medical history was significant for ulcerative colitis treated with biologic therapy (Adalimumab) for the past two years. The investigations revealed septic shock, respiratory failure due to severe pneumonia. The obstetrical risk assessment conducted to emergency C section delivery due to high risk of complications and even death for both mother and child. A healthy premature baby was admitted to neonatal unit and the next day, the mother was transferred to infectious diseases intensive care unit.

On admission to the intensive care unit, she was tachypneic (24 breaths/min) with an oxygen saturation of 88% on room air, desaturating on minimal exertion. Laboratory investigations revealed a systemic inflammatory response, with a procalcitonin of 33.9 ng/mL (ref: <0.5), C-reactive protein 21.15 mg/dL (ref: <0.5) and marked neutrophilic leukocytosis. Arterial blood gas analysis confirmed severe acute hypoxemic respiratory failure. A chest radiograph showed a left upper lobe consolidation. While blood cultures remained negative, the urinary antigen test for Legionella was positive. The definitive diagnosis was established via a multiplex PCR respiratory panel, which simultaneously detected Legionella pneumophila and SARS-CoV-2. The patient was managed with a multi-modal strategy including targeted antimicrobial therapy (Levofloxacin), antiviral treatment (Remdesivir) and immunomodulation with Dexamethasone, alongside supportive care. This approach led to a rapid clinical and biochemical recovery. Inflammatory markers normalized, oxygen requirements decreased significantly, and she was discharged in an improved condition after an 8-day hospitalization. At the 3 weeks follow up evaluation, both mother and child were in healthy condition.

Conclusion: This case highlights a rare and severe presentation of sepsis caused by a co-infection with Legionella pneumophila and SARS-CoV-2 virus. The patient's profound vulnerability stemmed from the convergence of the pregnancy condition and immunosuppressive therapy for ulcerative colitis, creating an unfavorable risk alignment for fulminant disease. The key learning points include the critical importance of maintaining a broad differential for atypical and multiple pathogens in immunocompromised hosts and the pivotal role of multiplex molecular diagnostics in achieving rapid and accurate diagnosis. This case demonstrates that despite extreme initial severity, a tailored therapeutic strategy combining targeted antimicrobial, antiviral, and judicious immunomodulatory agents can lead to a successful outcome.

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