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EARLY RECOGNITION AND MANAGEMENT OF NEUTROPENIC SEPSIS AFTER HEMATOPOIETIC STEM CELL TRANSPLANTATION IN CHILDREN

Robert Makharashvili, Ia Epitashvili, Ketevan Gabriadze, Tamta Nozadze

Pediatric Intensive Care Unit of G. Zhvania Pediatric University Clinic, Tbilisi State Medical University, Tbilisi, Georgia

Background: Life-threatening infections are a relevant complication of hematopoietic stem cell transplantation (HSCT) in children, largely due to defects in immune reconstitution. Recovery of neutrophils does not necessarily reflect the status of the adaptive immune system. The combination of neutropenia and humoral immunodeficiency confers a higher risk for development of severe infections, sepsis and septic shock.

Aims: To summarize the pathophysiology, diagnosis and treatment of neutropenic sepsis in children after HSCT with a focus on the clinical relevance of humoral immunodeficiency.

Methods: Narrative review of the peer-reviewed literature and international guidelines supplemented by a retrospective case description of one anonymized patient. Description of clinical presentation, antimicrobial therapy, hematological parameters, immune assessment, and outcome.

Clinical Presentation: Admission of a 35-month-old boy one year after allogeneic HSCT for acute myeloid leukemia for severe pneumonia, acute respiratory failure and clinical septic shock. Oxygen saturation 87% in room air, C-reactive protein 229.78 mg/L, absolute neutrophil count (ANC) 0.85 x 10(9)/L. During hospitalization ANC dropped down to 0.44 x 10(9)/L. Bilateral pulmonary infiltrates on chest CT, ultrasonography of the thorax: loculated right parapneumonic effusion. Pleural drainage performed; antimicrobial therapy upgraded in the course of clinical deterioration. Discontinuation of vancomycin due to suspected drug-induced aggravation of neutropenia. Additional immune assessment revealed profound hypogammaglobulinemia (IgG 0.0249 g/L), treated with intravenous immunoglobulin (IVIG). Recovery of neutrophil counts was already underway when IVIG treatment was started. After control of the infection source and multidisciplinary treatment, improvement of respiratory function and hematological parameters. After 22 days of admission, the patient was discharged afebrile and hemodynamically stable, ANC 3.52 x 10(9)/L, oxygen saturation 98% on room air.

Conclusion: Neutropenic sepsis after HSCT calls for early recognition of organ dysfunction,

adequate antimicrobial treatment, early control of the infection source and monitoring of blood counts. In case of complicated course or prolonged duration of infection, humoral immunity should be assessed to address potentially treatable deficiency. Treatment with IVIG is warranted in case of documented severe hypogammaglobulinemia and should not be seen as a treatment per se of sepsis or be attributed to be the cause of recovery of neutrophil counts.
Keywords: sepsis, HSCT, septic shock, immunodeficiency, hypogammaglobulinemia