Infection Prevention Critical in Hematological Malignancies

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Patients with hematological malignancies face a high risk of severe infections due to disease-related immunosuppression and treatment-induced neutropenia. Effective prophylactic strategies are critical to mitigate this risk, directly impacting patient outcomes and treatment continuity.1

KEY TAKEAWAYS

- The Pivot: The EHA 2026 discussion reinforced the necessity of integrating established infection prevention protocols into routine care for hematological malignancy patients.
- The Data: Prophylactic antimicrobial regimens, including antibacterial, antifungal, and antiviral agents, significantly reduce infection rates and associated complications.
- The Action: Clinicians should rigorously adhere to evidence-based guidelines for infection prophylaxis, tailoring strategies to individual patient risk profiles and local epidemiology.

Infections represent a significant clinical challenge in the management of hematological malignancies, contributing substantially to morbidity, mortality, and healthcare costs. The compromised immune status of these patients, often exacerbated by intensive chemotherapy, stem cell transplantation, and novel targeted therapies, renders them highly susceptible to bacterial, fungal, and viral pathogens. The EHA 2026 session on 'Infections in Hematological Malignancies: Putting Prevention into Practice' underscored the importance of a proactive, multi-faceted approach to infection prevention, emphasizing the translation of established evidence into routine clinical practice.

Patients with hematological malignancies, such as acute leukemias, lymphomas, and multiple myeloma, often experience prolonged periods of severe neutropenia, defined as an absolute neutrophil count (ANC) below 500 cells/µL. This profound immunosuppression, coupled with mucositis induced by chemotherapy, creates portals of entry for pathogens originating from the patient's endogenous flora or the environment. The clinical presentation of infections in these immunocompromised individuals can be atypical, often lacking classic inflammatory signs, making early diagnosis challenging. Therefore, a high index of suspicion and prompt intervention are critical for improving patient outcomes.

The discussion highlighted that neutropenic fever, a common complication, necessitates prompt empirical broad-spectrum antibiotic therapy. However, the focus of the session was on preventing such events through prophylactic measures. For bacterial infections, fluoroquinolone prophylaxis (e.g., levofloxacin) is recommended for high-risk neutropenic patients, particularly those undergoing induction chemotherapy for acute myeloid leukemia or allogeneic hematopoietic stem cell transplantation (HSCT).1 This strategy has been shown to reduce the incidence of febrile neutropenia and Gram-negative bacteremia. However, concerns regarding antimicrobial resistance necessitate careful consideration of local resistance patterns and duration of prophylaxis.2 The mechanism of action for fluoroquinolones

involves inhibiting bacterial DNA gyrase and topoisomerase IV, enzymes essential for DNA replication, transcription, repair, and recombination. While effective, the widespread use of these agents can select for resistant strains, particularly Gram-positive bacteria and anaerobes, limiting their long-term utility and underscoring the need for judicious application.

Antifungal and Antiviral Prophylaxis

Invasive fungal infections (IFIs), primarily caused by Aspergillus and Candida species, are a major cause of mortality in patients with prolonged neutropenia or those undergoing HSCT. The EHA 2026 session reiterated the strong evidence supporting antifungal prophylaxis in these high-risk populations. Posaconazole is recommended for prophylaxis in patients undergoing induction chemotherapy for acute myeloid leukemia (AML) or myelodysplastic syndrome (MDS), and in allogeneic HSCT recipients with graft-versus-host disease (GVHD).3 Voriconazole or micafungin are also viable options depending on the specific patient risk factors and local epidemiology. The choice of antifungal agent is guided by the anticipated fungal pathogen spectrum and drug-drug interactions.4 For instance, posaconazole, an azole antifungal, inhibits ergosterol synthesis, a vital component of fungal cell membranes. Its broad spectrum against molds and yeasts makes it suitable for prophylaxis in high-risk settings. However, its pharmacokinetic profile and potential for drug interactions require careful monitoring.

Viral infections, particularly those caused by herpesviruses, also pose a substantial threat. Cytomegalovirus (CMV) reactivation is a common and serious complication following allogeneic HSCT, associated with increased non-relapse mortality. Pre-emptive therapy based on regular CMV DNA monitoring is the standard of care, but antiviral prophylaxis (e.g., letermovir) is increasingly utilized in high-risk HSCT recipients.5 Letermovir prophylaxis has demonstrated a significant reduction in clinically significant CMV infection.6 Prophylaxis against herpes simplex virus (HSV) and varicella-zoster virus (VZV) with acyclovir or valacyclovir is standard for patients undergoing intensive chemotherapy or HSCT, effectively preventing reactivation.7 These nucleoside analogs inhibit viral DNA polymerase, preventing viral replication. The efficacy of these prophylactic strategies relies on accurate risk stratification and consistent adherence to established protocols.

Beyond antimicrobial prophylaxis, the session emphasized the role of non-pharmacological interventions. These include strict hand hygiene, environmental controls, and patient education regarding symptom recognition and reporting. Vaccination strategies, where applicable, also contribute to reducing infection burden. For instance, influenza and pneumococcal vaccinations are recommended for eligible patients and their close contacts.8 The importance of a multidisciplinary approach, involving infectious disease specialists, pharmacists, and nursing staff, was highlighted as crucial for optimizing infection prevention strategies and ensuring adherence to guidelines. The session concluded that while significant progress has been made, ongoing surveillance for emerging pathogens and antimicrobial resistance patterns remains essential to adapt and refine prophylactic practices. Limitations in current prophylactic strategies include the potential for drug toxicities, the emergence of drug-resistant pathogens, and the inability to cover all potential infectious agents. Future research focuses on developing novel antimicrobial agents and personalized risk assessment tools to further enhance infection prevention in this vulnerable patient population.

CLINICAL IMPLICATIONS

The EHA 2026 session on infection prevention in hematological malignancies served as a timely reminder that despite advances in targeted therapies, the fundamentals of supportive care remain paramount. It is concerning that adherence to established prophylactic guidelines, particularly for antifungal and antiviral agents, is not universally consistent. The evidence base for agents like posaconazole and letermovir is robust, demonstrating clear benefits in reducing morbidity and mortality. Failure to implement these strategies consistently represents a missed opportunity to improve patient outcomes and, frankly, an avoidable burden on healthcare resources.

For clinicians, the message is unambiguous: prophylactic regimens are not optional extras but integral components of treatment protocols for high-risk patients. The argument that cost or potential for resistance outweighs the benefit often falls flat when confronted with the clinical and economic impact of a severe invasive fungal infection or CMV disease. Pharmaceutical companies developing these prophylactic agents have provided the data; it is now incumbent upon healthcare systems and individual practitioners to utilize them judiciously. The ongoing challenge of antimicrobial resistance, while legitimate, should prompt careful stewardship rather than outright avoidance of effective prophylaxis in appropriate patient populations.

Patients undergoing intensive treatments for hematological malignancies are already navigating complex therapeutic landscapes. Providing them with optimal infection prevention is not merely a clinical recommendation; it is a fundamental aspect of patient safety and quality of life. The EHA 2026 discussion reinforces that the 'practice' of prevention must be as rigorous and evidence-driven as the malignancy treatment itself. We have the tools; the imperative is to use them.

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