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Scientific comment

Prophylaxis with levofloxacin: bacterial infections and antimicrobial resistance in hematological malignancies[☆]

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Studies evaluating bacterial prophylaxis of patients under high risk for the development of febrile neutropenia have been published since the 1980s.¹⁻³ Initially, trimethoprim with sulfamethoxazole was used, but this is associated with an unacceptable risk of myelosuppression. Thus, fluoroquinolones became the treatment of choice worldwide, due to their good oral tolerability, broad antimicrobial spectrum, bactericidal activity, ability to preserve anaerobic gut microorganisms, and lack of myelotoxicity. Ciprofloxacin was initially used in this scenario, but the need to treat *Streptococcus viridans* led to a progressive trend to prescribing levofloxacin due to its better activity against this microorganism.⁴

Recent studies suggest that antibacterial prophylaxis with levofloxacin should be started when a neutropenia episode, secondary to chemotherapy, is expected. Decreasing rates of febrile neutropenic episodes and even all-cause mortality have been correlated with this approach.^{3,5,6} However, two aspects of this widely practiced procedure remain controversial and under discussion. First, it appears that the greatest benefit of antibiotic prophylaxis is restricted to patients who are expected to develop long and severe episodes of neutropenia (longer than seven days with neutrophils $< 100 \times 10^9$ cells/L).^{7,8} Second, increasing rates of fluoroquinolone resistance in this group of patients have been described in the medical literature, including in hematological services where this routine was adopted. The widespread use of antimicrobials in incorrectly selected patient populations and the rise in bacterial resistance to these drugs exemplify a well-known phenomenon in the field of antimicrobial therapy. Indeed, the massive use of

fluoroquinolones for prophylaxis and the emergence of bacterial resistance have already been noted in respiratory and genitourinary diseases.⁹⁻¹¹

Thus, efforts in implementing protocols in order to select patients at real risk for the development of long and severe febrile neutropenic episodes are urged. Patients submitted to hematopoietic stem cell transplants and those in the conditioning period of acute myeloid leukemia chemotherapy are at the highest risk of developing long and severe episodes of febrile neutropenia, and are therefore appropriate candidates to receive antimicrobial prophylaxis.^{8,9} This measure is able to decrease fluoroquinolone exposure in thousands of patients and potentially contribute to control bacterial resistance related to antimicrobial selective pressure.^{10,11} In this issue of the Revista Brasileira de Hematologia e Hemoterapia, Lopes et al. present a study on the use of prophylaxis with levofloxacin in a hematopoietic stem cell transplant unit.¹²

Conflicts of interest

The author declares no conflicts of interest.

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*See paper by Lopes LA et al. on pages 35-42.

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