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Levofloxacin Versus Ciprofloxacin Prophylaxis In Pediatric Cancer Patients At High Risk Of Infection

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LEVOFLOXACIN VERSUS CIPROFLOXACIN PROPHYLAXIS IN PEDIATRIC CANCER PATIENTS AT HIGH RISK OF INFECTION

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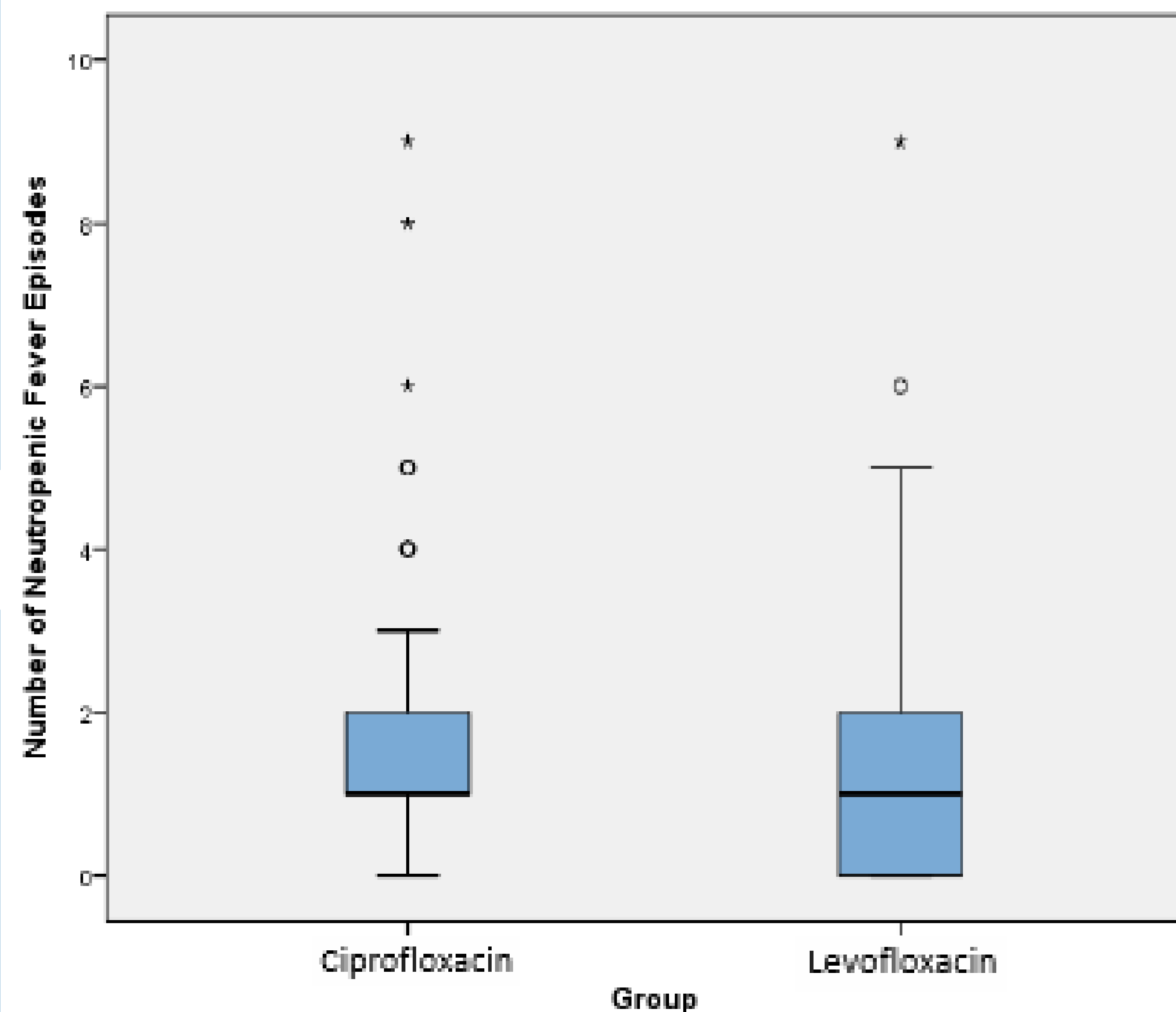
Background

- Patients with cancer and those undergoing chemotherapy are at risk of developing bacterial infections due to myelosuppression. Patients undergoing the most intensive chemotherapy regimens are at a higher risk for morbidity and mortality due to profound neutropenia.
- Antibacterial prophylaxis is given to reduce the incidence of infection in those at highest risk.
- Starting March 1, 2016, our institution used ciprofloxacin for prophylaxis however recent literature supports using levofloxacin in certain high risk (HR) populations due to greater efficacy in reducing neutropenic fever (NF) and bacteremia.
- Therefore, we switched to this April 1, 2019 and used this change in our standard of care as an opportunity to evaluate instances of NF and bacteremia between the two fluoroquinolones.
- Objective: To determine if there is a significant difference in the incidence of NF, bacteremia, fungal infections, Clostridioides difficile infections, and intensive care unit (ICU) admissions in patients with malignancies at HR for infection [defined as acute myeloid leukemia (AML), relapsed acute lymphoblastic leukemia/ lymphoma (ALL), infant ALL, Down Syndrome ALL, Burkitt lymphoma, and those who have undergone autologous or allogeneic hematopoietic stem cell transplant (HSCT)] in those who have received levofloxacin compared to ciprofloxacin prophylaxis

Methods

- This is a retrospective chart review study of patients at HR for infection and who received bacterial prophylaxis with levofloxacin and/or ciprofloxacin from March 1, 2016 to June 30, 2020.
- We reviewed charts individually and collected data including patient demographics, details regarding antimicrobial prophylaxis and the incidence of NF, bacteremia, fungal infections, C. difficile infections, and ICU admissions.
- Logistic regression models with repeated measures approach was performed for the dichotomous outcomes.

Outcomes	Levofloxacin	Ciprofloxacin	p-value
n (%)	n = 70	n = 115	
Neutropenic fever	50 (71.4%)	95 (82.6%)	0.056
Bacteremia	29 (41.4%)	54 (47%)	0.496
Fungal infection	8 (11.4%)	7 (6.1%)	0.216
C. difficile	6 (8.6%)	15 (13%)	0.261
ICU admission	11 (15.7%)	11 (9.6%)	0.249



Results

- A total of 133 patients were included however as some patients received both antibacterial prophylactic medications at different time points, these were separated into different encounters. Each relapse instance and transplant period were also separated. This method brought the total number of encounters to 115 for ciprofloxacin group and 70 for levofloxacin group.
- Median age was 6 years, 58% were male, and 62% were White
- Fluoroquinolone exposure time was similar for both groups (p=0.99)
- Of the 115 ciprofloxacin encounters, 95 (82.6%) had at least one episode of NF while this was the case in 50 (71.4%) of the levofloxacin encounters. This finding approached significance with p value = 0.056.
- The median number of neutropenic fever episodes, which took in to account the length of exposure, was 1 for the ciprofloxacin group (IQR 1-2) and 1 for the levofloxacin group (IQR 0-2), p = 0.052.
- Percentage of bacteremia episodes, fungal infections, C. difficile infections, and admissions to ICU was not statistically significant between patients who received ciprofloxacin compared to those who received levofloxacin.

Conclusion

- Levofloxacin as antibacterial prophylaxis is the standard of care at our institution for patients at HR for infection.
- While difference in incidence and median number of NF did not reach statistical significance between the levofloxacin and ciprofloxacin groups, it did approach significance which is clinically noteworthy as this will result in less hospitalizations and less cephalosporin exposure.
- Further analysis regarding incidence of alpha hemolytic strep bacteremia and fluoroquinolone resistance as well as outcomes by diagnosis will be performed.
- Future studies with a larger patient population would be beneficial.

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