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Cessation of Ciprofloxacin Prophylaxis in Hemato-Oncology Patients

To the Editor—We read with interest the article by Satlin et al [1] and the accompanying editorial [2]. In September 2019, our tertiary stem-cell transplant center in London discontinued routine use of fluoroquinolone (ciprofloxacin) prophylaxis for inpatients anticipated to have prolonged neutropenia. The factors that prompted this change in practice were high rates of ciprofloxacin resistance in gram-negative bloodstream infections (BSIs) both locally (59%, and 75% in extended-spectrum beta-lactamase [ESBL]–producing organisms) and nationally [3], the detrimental impact of broad-spectrum antibiotics on the microbiome in transplant patients [4, 5], and regulatory alerts about disabling side effects [6].

To assess the impact of stopping ciprofloxacin prophylaxis in 2019, we retrospectively analyzed all cases of *Escherichia coli* bacteremia between April 2017 and April 2021 in patients who received intensive chemotherapy or stem cell transplantation (Table 1). Fifty-nine patients were identified, mean age 51 years, 28.8% women, of whom 30 received ciprofloxacin prophylaxis and 29 did not. Seventeen of these patients had a transplant during their stay, 5 (17%) vs 2 (7%) autografts and 2 (7%) vs 8 (28%) allografts among those on ciprofloxacin vs no prophylaxis, respectively ($P = .063$). Five (16.6%) patients who received prophylaxis were admitted to the intensive care unit (ICU) compared with 2 (6.9%) patients not on prophylaxis ($P = .424$). The proportion who survived at 7 and 30 days post-bacteremia onset was 93% and 87% in the prophylaxis group compared with 100% and 96.6% in the no prophylaxis group ($P = .611$). The mean (median) length of stay was 33.7 (30.5) days for those who took ciprofloxacin and 35.5 (28) days for those who were not on prophylaxis ($P = .611$). Rates of ciprofloxacin-resistant *E. coli* bacteremia were 73% in the prophylaxis group and 29% in the no prophylaxis group ($P = .001$). ESBL resistance mechanisms were more frequent in the prophylaxis group (33%) than the no prophylaxis group (11%; $P = .057$). After controlling for year of admission and receipt of transplant this stay in logistic regression models, those who received prophylaxis were 5.29 times more likely to have ciprofloxacin resistant *E. coli* ($P = .037$; 95% confidence interval [CI], 1.11–25.23) and 7.71 times more likely to have ESBL resistance mechanisms detected ($P = .055$; 95% CI, 1.04–57.0).

In summary, stopping ciprofloxacin prophylaxis resulted in significantly lower rates of antimicrobial resistance in *E. coli* isolates that cause BSI, with no significant

Table 1. Bivariate Associations Between Measures of Interest and Ciprofloxacin Prophylaxis Among Adult Hematology Admissions With *Escherichia coli* Bacteremia

	Total n (%), Mean (Median) N = 59	Ciprofloxacin Prophylaxis n (%), Mean (Median) N = 30	No Prophylaxis n (%), Mean (Median) N = 29	*P* Value
Age, years	51 (53)	54 (55)	48 (53)	.156 [a]
Female (vs male)	17 (28.8)	9 (30.0)	8 (27.6)	.838[b]
Received transplant this treatment round				.063[c]
No	42 (71.2)	23 (76.7)	19 (65.5)	
Autograft	7 (11.9)	5 (16.7)	2 (6.9)	
Allograft	10 (17.0)	2 (6.7)	8 (27.6)	
Admitted to intensive care unit	7 (11.9)	5 (16.7)	2 (6.9)	.424[c]
Length of stay this admission, days	34.5 (28)	33.7 (30.5)	35.5 (28)	.611[a]
Year of admission				<.001[c]
2017	11 (18.6)	10 (90.9)	1 (9.1)	
2018	9 (15.3)	8 (88.9)	1 (11.1)	
2019	14 (23.7)	9 (64.3)	5 (35.7)	
2020	19 (32.2)	2 (10.5)	17 (89.5)	
2021	6 (10.2)	1 (16.7)	5 (83.3)	
7-day survival post-bacteremia	57 (96.6)	28 (93.3)	29 (100)	.492[c]
30-day survival post-bacteremia	54 (93.1)	26 (89.7)	28 (96.6)	.611[c]
Ciprofloxacin resistant *Escherichia coli*	30 (50.9)	22 (73.3)	8 (27.6)	.001[b]
Extended-spectrum beta-lactamase–producing *E. coli*	13 (22.0)	10 (33.3)	3 (10.3)	.057[c]

[a]Wilcoxon rank sum test.
[b]χ^2 test.
[c]Fisher exact test.

increase in mortality, ICU admissions, or length of stay. The sample size was relatively small and focused on a single pathogen but supports the move away from universal fluoroquinolone prophylaxis. We are performing a prospective audit to assess the impact of cessation of antibacterial prophylaxis on the incidence and outcomes of all BSIs, and on the amount and spectrum of antimicrobial use.

In the words of the editorial [2], "the elephant in the room" is indeed the routine use of fluoroquinolone prophylaxis in hemato-oncology. Previous randomized, controlled trials that examined antibacterial prophylaxis in patients with cancer reported reductions in episodes of fever but not mortality[7, 8]. We posit that cessation of universal fluoroquinolone prophylaxis may lead to more febrile episodes but will result in greater diagnostic yield from blood cultures, less resistant isolates, and no increase in mortality or ICU admission.

Note

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