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Background

The aim of this study was to evaluate the impact of intestinal colonization with multi-resistant bacteria, including extended-spectrum beta-lactamase producing Enterobacteriaceae (ESBL-E) and non-fermenting Gram-negative bacilli (NFGNB), on BSI with respective microorganisms in neutropenic patients with acute myeloid leukemia (AML) and acute lymphoblastic leukemia (ALL).

Material/methods

Single-center, prospective observational study in adults with newly diagnosed AML and ALL was performed in 2013-2015. Patients were followed up for 180 days. Rectal swabs were collected prior to antibiotic administration.

Results

Total of 110 patients were enrolled (50-male, 60-female; median age-32) from them 66 were with AML and 44 with ALL.

These patients had 242 febrile neutropenic episodes (FNE) of them 19% (n=45) were attributable to BSI, including those caused by ESBL-E (n=7) and NFGNB (n=5).

Intestinal colonization with multi-resistant Gram-negative bacteria prior to antibiotic initiation was in 40% (n=97) of FNE, including patients colonized by both ESBL-E and NFGNB (n=10). Thus intestinal colonization with ESBL-E and NFGNB prior to antibiotic initiation was in 31% (n=74) and 14% (n=33) of FNE, respectively. Other 60% (n=145) were non-colonized with multi-resistant Gram-negative bacteria (Figure).

The rate of BSI caused by ESBL-E in patients colonized with subsequent microorganisms was 10% (7/74) compared to 0% (0/145) in non-colonized patients (p=0.0004) (Table 1).

In patients colonized with NFGNB the rate of BSI with these microorganisms was 15% (5/33), whereas in non-colonized patients – 0% (0/145), p=0.0001 (Table 2).

Results

- ✓ Period of study 2013-2015
- ✓ Follow-up period 180 days
- ✓ No of patients 110 (50 male, 60 female)
 - 66 AML
 - 44 ALL
- Median age 32 (17-64) years
- ✓ 242 Febrile neutropenic events
 - 45/242 (19%) – BSI
 - 7/45 (16%) caused by ESBL-E
 - 5/45 (11%) caused by NFGNB
 - 33/45 (74%) caused by other not multi-resistant bacteria

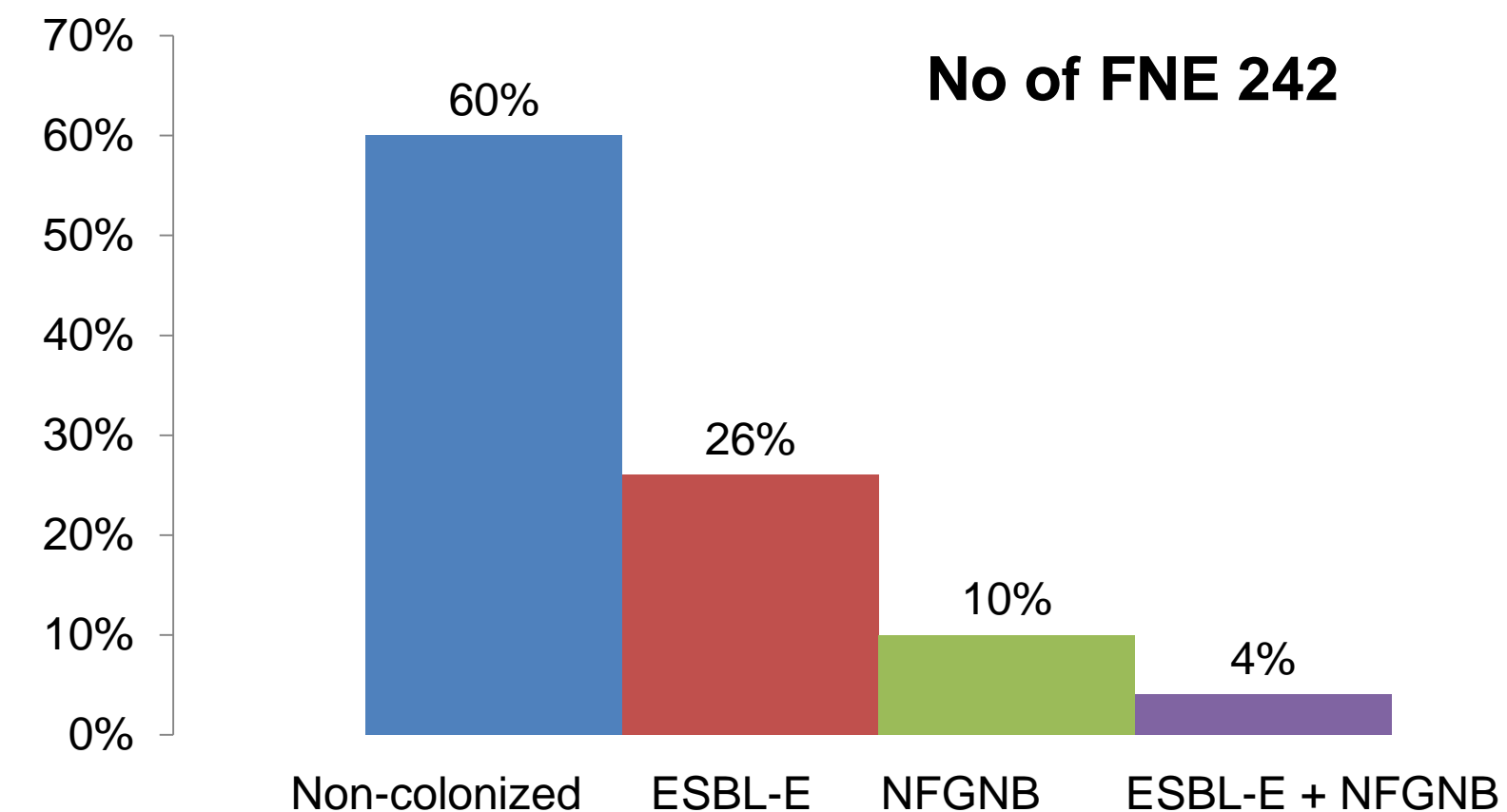


Figure. Intestinal colonization with multi-resistant Gram-negative bacteria in FNE prior to antibiotic initiation

Table 1. The rate of BSI caused by ESBL-E in patients colonized with subsequent microorganisms vs non-colonized patients

	Intestinal colonization with ESBL-E		p
	Yes n=74	No n=145	
Rate of BSI caused by ESBL-E	10%	0%	0.0004

Table 2. The rate of BSI caused by NFGNB in patients colonized with subsequent microorganisms vs non-colonized patients

	Intestinal colonization with NFGNB		p
	Yes n=33	No n=145	
Rate of BSI caused by NFGNB	15%	0%	0.0001

Conclusions

Prior intestinal colonization with multi-resistant Gram-negative bacteria was a predictor of BSI with respective microorganisms in neutropenic patients with acute leukemia. Whereas no cases of BSI caused by multi-resistant Gram-negative bacteria occurred in patients without prior colonization with these microorganisms.