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Intestinal colonization with multi-resistant Gram-negative bacteria is a predictor of bloodstream infection (BSI) in neutropenic patients with acute leukaemia

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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 nonfermenting 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.

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).

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.

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.