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# P2409 The PIRATE project: pathogens and resistance profiles in patients with Gram-negative bloodstream infections

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**Background:** Bloodstream infection epidemiology has shifted, with *Escherichia coli* overtaking *Staphylococcus aureus* as the most frequent etiologic agent. The Swiss National Science Foundation-funded PIRATE Project is an ongoing multicenter, point-of-care randomized trial comparing durations of antibiotic therapy for gram-negative bacteremia (GNB) in a target sample of 500 patients throughout Switzerland. Baseline blood cultures for pathogen identification and resistance patterns were assessed.

**Materials/methods:** The PIRATE Project launched in April 2017; adult patients hospitalized with GNB in Geneva, Lausanne, and St. Gallen are randomly assigned on their 5$^{th}$ day of therapy to 14 days of antibiotic therapy, 7 days, or an individualized duration determined by clinical response and a 75% reduction in C-reactive protein. Immunosuppressed patients and those with complicated infections (endocarditis, etc.) and/or non-fermenting bacilli, Brucella spp, Fusobacterium spp or polymicrobial growth with gram-positive organisms are ineligible. The primary outcome is incidence of clinical failure at day 30; secondary outcomes include clinical failure and all-cause mortality in the 90-day study period. This analysis was performed when 332 of the 500 patients had been enrolled; data are from interim databases.

**Results:** Participants' median age is 80 years (interquartile range 69-86); women make up 60% (198/332). Most GNB was secondary to urinary tract infection; *E. coli* was most frequently identified (253/332, 76%) followed by *Klebsiella* spp. (51/332, 15%), *Proteus* spp (13/332, 4%) and *Enterobacter* spp. (11/332, 3%). Among *E. coli* strains, 97/253 (38%) were resistant to amoxicillin-clavulanate, 37/253 (15%) to piperacillin and 21/253 (8%) to piperacillin-tazobactam; 30/253 (12%) carried an extended-spectrum beta-lactamase (ESBL), with 23/251 (9%) resistant to cefepime. Among Klebsiella spp., 38/51 (75%) were resistant to amoxicillin-clavulanate, 10/51 (20%) to piperacillin, 5/51 (10%) to piperacillin-tazobactam; 6/51 (12%) were ESBL-positive, with 2/51 (4%) resistant to cefepime. Women were more likely to have an *E. coli* infection (81% versus 69%, p=.008), while men trended toward more frequent Klebsiella infections (19% versus 12%, p=.097).

**Conclusions:** *E. coli* is the leading cause of GNB in this population, with Klebsiella spp. a distant second. Compared to historic data, resistance to beta-lactam-beta-lactamase-inhibitor combinations and later-generation cephalosporins is increasing for both of these organisms.