Extended-spectrum beta-lactamase-producing Enterobacteriaceae in colorectal surgical site infections: is there a need for adjustment of surgical antibiotic prophylaxis in carriers?

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Background: Surgical antibiotic prophylaxis (SAP) is a key prevention strategy against surgical site infections (SSI). Recent data suggest a reduction of colorectal SSI after adaptation of SAP in carriers of extended-spectrum β-lactamase (ESBL)-producing Enterobacteriaceae. We therefore aimed to estimate the potential impact of such an intervention by analyzing the spectrum of SSI-causing pathogens, which are not covered by SAP, in a cohort of colorectal surgery patients.

Materials/methods: Based on the nationwide prospective Swissnoso SSI surveillance database and according to their definitions of SSI, we included patients undergoing elective or emergency colorectal surgery at our tertiary care hospital in Eastern Switzerland between 10/2015 and 09/2017. Patients with antibiotic treatment before surgery were excluded. For every patient with documented SSI, we retrospectively gathered data on antibiotic agents used for SAP and on pathogens discovered in microbiological samples.

Results: A total of 732 patients were included. Eighty patients (11%) suffered an SSI, whereof most (98%) received cefamandole and metronidazole for SAP. Of those 80 patients, 45 were excluded because of missing microbiology results. In 26 (74%) of the remaining 35 patients, either all (n=12) or some of the detected pathogens (n=14) were not covered by SAP. We identified 3 patients (9%) with SSI caused by ESBL-E. coli. Other pathogens not covered by SAP were Hafnia alvei (1 patient), Enterobacter species (2 patients), Pseudomonas aeruginosa (6 patients), yeasts (polymicrobial in 5 patients), and enterococci (monomicrobial in 3 patients; polymicrobial in 16 patients). Two patients had negative microbiology results.

Conclusions: Detection of ESBL-producing Enterobacteriaceae causing SSI was rare in this cohort. Preoperative screening of ESBL-carriage and adaptation of SAP in carriers could have potentially prevented 3 SSI. Given a number needed-to-screen of 244, this raises questions about the cost-effectiveness of this measure in a low-prevalence setting. A limitation of our study is the lack of microbiology results in some patients. However, lack of microbiology results suggests that these patients responded well to empirical treatment, which makes the presence of ESBL-producers unlikely. The broad spectrum of pathogens not covered by SAP underlines the limitations of current SAP regimens in the prevention of SSI in colorectal surgery.