Background: Antibiotics are needed for perioperative intensive care after cardiovascular surgery, but use is sometimes excessive, requiring intervention.

Methods: We analyzed antibiotic use and patient characteristics after scheduled cardiovascular operations (including 76 coronary artery bypass grafting and 96 valve/arch replacements) in our hospital (726 beds and 8 intensive care unit (ICU) beds), excluding cases of infective vascular disorders (i.e. infective endocarditis and mycotic aneurysm) and emergency operations. Observation periods were 8 months in 2013 (intervention period; IP) and the same period in 2012 (pre-IP).

For the intervention, an infectious disease (ID) fellow rounded on the ICU every day, and three times a week our ASP team (ID physician, clinical ID pharmacist, nurse, and microbiologist) discussed carbapenem and anti-methicillin-resistant Staphylococcus aureus (MRSA) drug administration for ward patients. Routine perioperative caefazolin was not included in the analysis.

Results: We analyzed 86 cases (540 patient-days [PDs] in the ICU and 3576 inpatient PDs) in the IP and 98 cases (619 ICU PDs and 4012 inpatient PDs) in the pre-IP. There were no statistically significant differences between the IP and pre-IP for male sex, BMI, operative bleeding, days hospitalized, ICU stay, and survival rate. MRSA and extended spectrum β-lactamase infections (ESBL) producing bacteria infections occurred in 9.3% vs 8.2% and 1.7% vs 3.1% of cases in the IP and pre-IP, respectively. Maximum sequential organ failure assessment (SOFA) scores during the ICU stay were higher in the IP (8.8 vs 7.6, P<0.03, Mann-Whitney’s test). Antibiotic use in the ICU did not differ significantly between periods (183.4 and 222.9 DOT/1000 PDs), but was lower for the total hospital stay in IP vs pre-IP (142.9 vs 420.2 DOT/1000 PDs, P<0.001, chi-square test), especially for anti-MRSA drugs (17.7 vs 56.3 DOT/1000 PDs, P<0.001). The intervention shortened the mean duration of anti-MRSA drug use to 5.2 from 9.8 days in the IP and to 3.0 from 11.6 days in the ward. Total antibiotic expenditures in 8 months were 1.76 and 3.93 million JPY in IP and pre-IP, respectively.

Conclusion: The ASP team intervention decreased antibiotic use, optimizing anti-MRSA drug use, after cardiovascular surgeries without worsening patient prognosis in critical and ward care.

Effect of Antimicrobial Stewardship Program (ASP) on Perioperative Antibiotic Use in Cardiovascular Surgery in Japanese Tertiary Hospital

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Results and Conclusion (cont.)

In the ICU care, the ASP team’s intervention did not decrease the numbers of cases of antibiotic use but it non-significantly decreased the DOT and mean duration of antibiotic use. ASP intervention significantly decreased the DOT of total antibiotic use and especially anti-MRSA drug use in ward; it also decreased the total hospital stay of cardiovascular surgery patients without worsening patient prognosis, leading to antibiotic cost savings. We also consider daily close contact with ICU staff and surgeons through regular ID consultations and rounds to be important for convey an effective ASP.