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Pharmacoepidemiology, improved prescribing and antibiotic stewardship

The global point-prevalence survey of antimicrobial consumption and resistance (Global-PPS): results on antimicrobial prescriptions in Japanese hospitals

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Background: A uniform and standardized method for surveillance of antimicrobial use in hospitals was used to assess the variations in antimicrobial prescriptions in Japan. bioMérieux provided unrestricted funding support for the survey.

Material/methods: A point prevalence survey (PPS) was conducted in 2015 in hospitals in Japan. The survey included all inpatients receiving an antimicrobial agent on the day of the PPS. Data collected included age, gender, weight, antimicrobial agents, doses, reasons and indications for treatment, microbiological data, compliance with guidelines, and documentation of indications and stop/review date of prescription. Denominators included the total number of inpatients. A web-based application designed by the University of Antwerp (http://www.global-pps.com) was used for data entry, validation, and reporting.

Results: The survey covered 18 hospitals, including community, tertiary, and specialized hospitals (cancer centres and children hospitals), and 280 wards were surveyed overall. The antimicrobial prevalence rate was 31.7% (2,590 out of 8,183 patients admitted). Antimicrobial rates between wards varied from 9.3% (Neonatal Medical Ward) to 84.0% (Adult Transplant Ward). Among 3,381 antimicrobials used on the day, 1,819 (53.8%) agents were prescribed for the treatment of infectious diseases and 1,439 (42.6%) were prescribed for prophylaxis. The main indications for antimicrobial use were medical prophylaxis (26.2%), community-acquired infection (22.0%), non-intervention related hospital-acquired infection or *Clostridium difficile* (19.3%), and surgical prophylaxis (16.3%). Among surgical prophylactic antimicrobials, 75.9% of them were prescribed for more than one day. The top 3 antibiotic groups (ATC3 level) were J01D (other beta-lactam antibacterials, which includes cephalosporins and carbapenems; 36.1%), J01C (penicillins; 18.0%), and J01E (sulfonamides and trimethoprim; 12.4%). The top 3 antibiotics used were sulfamethoxazole and trimethoprim (10.8%), cefazolin (8.6%), and piperacillin and enzyme inhibitor (6.1%). Regarding quality indicators, the reasons for antimicrobial use was mentioned in the records for 2,088 (61.8%) agents and guideline compliance was appropriate for 2,051 (60.7%) prescriptions.

Conclusions: According to the survey, more than 40% of all antimicrobials prescribed in the participating hospitals were for prophylactic use. We need to enhance appropriate antimicrobial use for prophylaxis along with treatment, while antimicrobial stewardship campaigns have been largely focused on treatment. Other beta-lactam antibacterials, including cephalosporins and carbapenems, are the most used antimicrobial group, in contrast with European countries, where penicillins are the most prescribed antibiotics. This finding indicates that local data is necessary for hospitals and public health centres in order to increase the impact of antimicrobial stewardship programs/campaigns in

Japan. Compliance to local guidelines is inadequate and antimicrobial stewardship campaigns need to focus on improving prescription according to guidelines.
This survey was the first PPS of antimicrobial prescription in multiple Japanese hospitals, and it provides basic information for designing efficient antimicrobial stewardship programs. Repeated surveys are important to promote antimicrobial surveillance and appropriate use in the future.