

Editorial



Antimicrobial Consumption as a Key Component of Antimicrobial Stewardship Programs: a Meaningful Movement toward Evidence-based Antimicrobial Stewardship of Validated Outcome Measures

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► See the article “Trend of Antibiotic Usage for Hospitalized Community-acquired Pneumonia Cases in Korea Based on the 2010–2015 National Health Insurance Data” in volume 35, number 47, e390.

I had a meaningful opportunity to contribute to an editorial for the latest article on antibiotic usage in hospitalized patients with community-acquired pneumonia.¹ Abuse and overuse of antimicrobials are the main drivers in the development of antimicrobial-resistant pathogens. The clinical and economic implications of antimicrobial resistance pose a major threat to global public health. To alleviate this threat, global, regional, and national strategies have been established all over the world. In line with the global action plan adopted by the World Health Assembly in May 2015, the Korean 5-year action plan for containment of antimicrobial resistance has been also in operation since August 2016. This Korean strategy included a 6-pillar national action plan, and one of which was to strengthen the surveillance system for antimicrobial consumption.²

In Korea, the National Health Insurance and the Medical Aid program cover 97.1% and 2.9% of the population, respectively. This health insurance system facilitates a nationwide population-based study. Nevertheless, information on the antimicrobial consumption at the national scale has been dependent on personal research, analyzing National Health Insurance claims data collected through the Health Insurance Review and Assessment (HIRA) service. These studies, which depend on manual work of the private sector, cannot guarantee sustainability and consistency. These findings driven from the temporary studies only provide a snapshot of antimicrobial consumption. Longitudinal analysis of antimicrobial consumption offers useful material for investigating trends in its consumption for individual hospitals, groups of hospitals or whole countries. Ideally, it is necessary to establish a nationwide network with a permanent national repository of data on antimicrobial use, managed by public institutions, participated by both private and public hospitals, and supported by private medical experts. In order to be effectively utilized in the clinical field and policy making, the dataset should be updated regularly with the latest information on nationwide, hospital-specific, or disease-specific data, and data should be easily fed back to them, using a publicly accessible web tool maintained by public organizations, like Fingertips in the United Kingdom.³ Particularly, if the

process of data collection is computerized and automated in connection with a computerized antibiotic prescription or clinical decision support system, it can be advantageous for maintaining a sustainable system and minimizing data errors.

Data on the antimicrobial usage should be presented as the diverse metrics, in order to be used properly according to the purpose of changeability. Defined daily dose (DDD) and days of therapy per 1,000 patient days, and the frequency of daily consumption theoretically reflect the distinct aspects of antimicrobial consumption.⁴ However, it is difficult to apply the metrics other than DDD for analysis of antibiotic consumption using National Health Insurance claims data. Of note, the national medical expense reimbursement data to support administrative processes are not linked to sufficient clinical data. Therefore, we need to introduce advanced methods to collect easily real-data from physicians over the long term.

Not just measuring the quantity of antimicrobial consumption, the assessment of the quality of antimicrobial prescribing patterns should also be emphasized together. For the quality control of antimicrobial prescription at the Korean national level, the HIRA service has monitored antimicrobial prescription patterns and shared performance feedback for upper-respiratory infections since 2006 and surgical antimicrobial prophylaxis since 2007. In practice, these implements of the HIRA service reduced the volume of antibiotic prescription.^{5,6} However, since the punitive arbitration of government agencies may have limitations in effectiveness and compliance, it left the homework as a way to induce active participation.

Reduction of unnecessary antimicrobial use among patients is challenging because of the need to ensure early administration of empirical antibiotics effective against life-threatening pathogens with the potential for multidrug-resistance. Therefore, it is necessary to secure real-time information on the local epidemiology of antimicrobial resistance. In this respect, information on antimicrobial resistance should always be addressed with data on antimicrobial use. Considering the data on antimicrobial resistance, clinical guidelines on antibiotic prescriptions for various infectious diseases, which are periodically updated, should be introduced into the clinical field. A measure of compliance with clinical practice guidelines through data on antibiotic prescribing patterns can be used as a metrics of evaluation for antimicrobial prescription in infectious diseases.

During the past decades, patients and healthcare professionals have been struggling amid a tsunami of antimicrobial resistance. There has probably never been a more critical moment for antimicrobial stewardship. There is already a solid body of evidence demonstrating the benefits of monitoring antimicrobial consumption. Science-driving practice will lead us toward measuring and assessing antimicrobial consumption as an integral function of all healthcare facilities. It is hoped that their roles will be made with the rational support of the public sector on a standardized platform, in collaboration between private professionals and the government.

REFERENCES

1. Kim B, Myung R, Lee M, Kim J, Pai H. Trend of antibiotic usage for hospitalized community-acquired pneumonia cases in Korea based on the 2010–2015 ational Health Insurance Data. *J Korean Med Sci* 2020;35(47):e390.
[CROSSREF](#)
2. Ryu S. The new Korean action plan for containment of antimicrobial resistance. *J Glob Antimicrob Resist* 2017;8:70-3.
[PUBMED](#) | [CROSSREF](#)

3. Johnson AP, Muller-Pebody B, Budd E, Ashiru-Oredope D, Ladenheim D, Hain D, et al. Improving feedback of surveillance data on antimicrobial consumption, resistance and stewardship in England: putting the data at your Fingertips. *J Antimicrob Chemother* 2017;72(4):953-6.
[PUBMED](#)
4. Polk RE, Fox C, Mahoney A, Letcavage J, MacDougall C. Measurement of adult antibacterial drug use in 130 US hospitals: comparison of defined daily dose and days of therapy. *Clin Infect Dis* 2007;44(5):664-70.
[PUBMED](#) | [CROSSREF](#)
5. Yun JM, Shin DW, Hwang SS, Cho J, Nam YS, Kim JH, et al. Effect of public disclosure on antibiotic prescription rate for upper respiratory tract infections. *JAMA Intern Med* 2015;175(3):445-7.
[PUBMED](#) | [CROSSREF](#)
6. Kim ES, Park SW, Lee CS, Kwak YG, Moon C, Kim BN. Impact of a national hospital evaluation program using clinical performance indicators on the use of surgical antibiotic prophylaxis in Korea. *Int J Infect Dis* 2012;16(3):e187-92.
[PUBMED](#) | [CROSSREF](#)