LETTERS TO THE EDITOR

Should Infection Control Teams Enforce an Antimicrobial Stewardship Program for All Clinicians?

To the Editor—The Japan Council for Quality Health Care assesses Japanese hospitals according to various criteria and makes the results available on the Internet.[1] One of the most significant criteria is this: "Are specific antimicrobial agents (carbapenems, vancomycin, etc.) administered under a proper stewardship program, such as a permission and notification system?" Because of this item, many Japanese hospitals have forced all clinicians to work within the terms of the antimicrobial stewardship program without sufficiently considering the precise meaning of the criterion. Because "etc." and "proper" are not clearly defined, a variety of types of antimicrobial stewardship can be found in Japan. The typical program applies to all clinicians and checks prescriptions or requires permission to use specific agents. Some Japanese studies have reported that the antimicrobial stewardship program is as useful in Japan as in Western countries.[2] However, the adverse effects of the stewardship program have not yet been described in detail or discussed thoroughly. I present here some questions related to a type of stewardship program that can apply to all clinicians.

The first problem concerns utility. It has been reported that stewardship programs that include a requirement for prior approval of antimicrobial prescriptions have led to improved patient outcomes and decreased rates of antimicrobial resistance.[3-5] On the other hand, there is a study reporting that that intervention was not useful,[6] so there is no consensus about its utility. However, its utility is generally thought to depend only on the number of clinicians in hospitals who cannot administer the proper agents in a proper manner. In other words, the greater the number of competent clinicians in a given hospital, the less useful the stewardship program is. It is therefore not surprising that conclusions about outcomes resulting from the stewardship program vary widely.

The second problem is the cost of the program in terms of time and labor. For most clinicians who can administer antibiotics optimally, the program imposes a new burden, because they have to follow complex procedures whenever they use antibiotics. The resultant worldwide waste of labor and time is enormous. In addition, frequent application of the procedures can interfere with clinical practice and may generate antagonism between the infection control team and clinicians,[1] especially hematologists, because the febrile neutropenia guidelines recommend using a carbapenem or a cephem as a first-line agent.[7]

The third problem is accountability. Previous reports have not dealt with how consensus is achieved when controversy arises between a clinician and the infection control team, so it remains unclear whether accountability for the clinical outcome rests with the infection control team or the clinician. These problems deserve to be considered as significant as the emergence of new drug-resistant bacteria.

It is certain that stewardship programs are more significant than ever for ensuring the continued efficacy of available antimicrobials, because few new agents are being developed, but stewardship programs that apply to all clinicians entail some major problems. Education for only those clinicians who do not have sufficient knowledge about antibiotics is thought to be enough to improve patient outcomes and decrease rates of antimicrobial resistance. Consensus between the infection control team and the clinicians regarding accountability also requires immediate attention. Forcing all clinicians to follow an antimicrobial stewardship program may also reduce the quality of medical care, so such a program should be implemented only after there have been improvements resulting from resolution of the problems outlined here.

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Kenichi Nomura, MD, PhD

From the Department of Hematology and Oncology, Kyoto Prefectural University of Medicine Graduate School of Medical Science, and the Division of Microbiology, Kyoto Prefectural Institute of Public Health and Environment, Kyoto, Japan.

Address reprint requests to Kenichi Nomura, MD, PhD, Department of Hematology and Oncology, Kyoto Prefectural University of Medicine Graduate School of Medical Science, Kawaramachi-Hirokoji, Kamigyo-ku, 602-8566, Kyoto, Japan (nomuken@koto.kpu-m.ac.jp).

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Simple Quality Improvement Interventions Reduce Unnecessary Intravascular Device Dwell Time

To the Editor—Intravascular devices (IVD) are a vital part of medical care. IVD-associated infections are an important cause of iatrogenic morbidity in inpatients. IVD-related bloodstream infections (BSI) prolong hospital stay and increase costs.[1] IVD-related phlebitis is also a significant problem.[2] The risk of IVD-associated complications correlates with IVD dwell time.[1] The Centers for Disease Control recommends prompt removal of nonessential IVDs to reduce the rate of IVD-related BSI (category IA recommendation).[3]

Parenti et al[4] showed that quality improvement programs could reduce the unnecessary use of IVDs. We identified the leaving of IVDs in situ unnecessarily as a significant quality issue at Auckland City Hospital. We therefore developed low-cost interventions intended to reduce unnecessary IVD dwell time, and we assessed their effectiveness.

The interventions were implemented on the 4 internal medicine wards at Auckland City Hospital, a 700-bed tertiary hospital. The first intervention was a sticker placed in every patient's clinical notes each morning. This required the medical team to indicate whether IVDs were required or should be removed, and this also required the nursing staff to contact the medical team if no indication was made. The second intervention was the daily distribution of an educational pamphlet (designed to be printed on the daily menu sheet) to every patient. This pamphlet showed a photograph of a peripheral IVD and explained the usefulness of these devices and their potential to cause infection. It requested that patients with an IVD in situ ask their doctors and nurses whether it was still required.

Baseline data were gathered for 14 consecutive days beginning 7 weeks prior to the implementation of the interventions. The interventions were implemented on 14 consecutive days, during which the same types of data were collected. Each patient was assessed daily, and the number and type of IVDs in situ were recorded. Each patient assessed was counted as a patient-day. If an IVD was present in the patient, this was counted as an IVD-day. If a patient had more than 1 IVD, each device was counted as 1 IVD-day.

Each IVD-day was defined at the time of review as "necessary" or "unnecessary" according to strict prespecified criteria. An IVD was deemed necessary if the patient was receiving appropriate intravenous antibiotic therapy; was receiving other intravenous medications or hydration; had an unstable condition, such as seizures or gastrointestinal bleeding, or was undergoing cardiac monitoring; or had a procedure requiring vascular access planned within the following 24 hours. If a patient had more than 1 IVD in situ, each IVD-day required a separate indication to be defined as "necessary." Because these interventions were being assessed as a quality improvement exercise, approval by the institutional review board was not considered to be required.[5] The project was approved by the head of the Department of Internal Medicine and by the charge nurses of the wards involved.

The results during the baseline and intervention periods are shown in the Table. A statistically significant reduction in the number of both total IVD-days and unnecessary IVD-days occurred during the intervention period. The percentage of patient−days on which an unnecessary IVD was in use during the intervention period was reduced by 7.8% (from 20.4% to 12.6%; $P < .001$). Therefore, for every 13 patient-days of intervention, 1 unnecessary IVD-day was avoided.

We have shown that the introduction of 2 low-cost interventions can significantly reduce the number of unnecessary IVD-days. This would be expected to result in a reduction in the incidence of IVD-related complications, including BSI. Infection control measures such as these are also increasingly important because of the emergence of antimicrobial resistance among nosocomial pathogens.

A recent meta-analysis showed the risk of IVD-related BSI associated with use of peripheral short lines (which accounted for more than 95% of the IVDs in our internal medicine wards) was 0.5 cases per 1,000 IVD-days.[1] Thus, 1 IVD-related BSI would be prevented per 26,000 patient-days, with our interventions. The estimated cost of the interventions was US$0.10 per patient-day, which is equivalent to $2,600 per IVD-related BSI prevented. This compares favorably with the

TABLE. Characteristics of Intravascular Device (IVD) Use During the Baseline and Intervention Periods

Variable	Baseline period	Intervention period	P[a]
No. of patient-days	1,148	1,153	
Patient characteristics			
Male sex	478 (41.6)	490 (42.5)	.67
Age in years, mean	71.0	70.3	.27
Total no. of IVD-days	625	506	<.001
No. of necessary IVD-days (% of patient-days)	391 (34.1)	361 (31.3)	.31
No. of unnecessary IVD-days (% of patient-days)	234 (20.4)	145 (12.6)	<.001

Note. Data are no. (%) of patients unless otherwise indicated. If a patient had more than 1 IVD, an IVD-day was counted for each device. For definitions of "necessary" and "unnecessary," see the text.

[a] The Fisher exact test (2-tailed) was used for categorical data and the Student *t* test for the comparison of mean ages.

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