Improving Prescribers to Advance Antimicrobial Stewardship

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In an era of ever-increasing antibiotic resistance, antimicrobial stewardship plays a vital role in improving patient outcomes and ensuring the appropriate use of these agents. In this issue of Clinical Infectious Diseases, Hamilton et al acknowledge that most formalized antimicrobial stewardship programs (ASPs) do not currently employ a routine intervention with the antibiotic prescriber at the point of prescription [1]. These authors suggest that point-of-prescription interventions with frontline healthcare providers have the potential to expand existing ASPs and provide alternative approaches to performing stewardship at institutions without ASPs. While it is true that a multidisciplinary team often assumes the responsibility for direct patient care in the inpatient setting, the overwhelming majority of prescriptions, including those for antibiotics, are written by physicians. Thus, if we are to place the responsibility of appropriate antimicrobial use on physicians at the point of prescribing, it is pertinent to examine the perceptions and knowledge of these prescribers toward stewardship and appropriate antimicrobial use.

In 2013, Abbo et al conducted a multi-center electronic survey evaluating the perceptions and knowledge of antimicrobial education and prescribing of fourth-year medical students from 3 medical schools in the United States [2]. Only 40% of the respondents were even familiar with the term “antimicrobial stewardship,” and 90% reported that they would like more education on the appropriate use of antimicrobials. Just 15% had completed a clinical infectious diseases rotation while in medical school, and <33% understood the correct spectrum of antimicrobials and felt well prepared to streamline and de-escalate antimicrobial therapy. The students’ mean correct knowledge score on an assessment using 11 clinical vignettes was 51%. Although this survey evaluated medical students with limited clinical experience, similar results have been demonstrated in surveys of inpatient internal medicine physicians [3]. In one survey, 97% of physicians believed that widespread and inappropriate use of antibiotics was an important cause of resistance, and only 66% believed that a reduction in antimicrobial use was an effective remedy, compared with the 95% of infectious diseases physicians who believed this was an effective approach [3]. In a similar survey, 94.8% of clinicians agreed that antimicrobial resistance was a problem nationally, whereas only 65.3% agreed that it was a problem within their own practice [4]. They reported that practicing antimicrobial control was one of the most important steps toward preventing antimicrobial resistance but also cited it as the step having the most barriers to implementation. A lack of knowledge and education regarding antimicrobial use and resistance was cited by 46% of clinicians in the focus group as a barrier to preventing resistance [4].

If we are to rely on prescribers to be stewards of our antibiotics, improve patient outcomes, and decrease antimicrobial resistance, a 2-tiered approach may need to be considered. The first is to create a robust antimicrobial stewardship effort that involves a multifaceted approach built around core strategies that do not rely solely on physician practices at the point of antibiotic prescribing. As demonstrated in the pilot study by Hamilton et al [1], the antibiotic flowsheet rarely resulted in an intervention unless the flowsheet was implemented by a pharmacist who was not doing the prescribing. An effect on antimicrobial prescribing was almost never reported when the prescribers themselves were responsible for completion of the flowsheet.

Hamilton et al suggest that a point-of-prescribing intervention could supplement an existing ASP or be a strategy for...
performing stewardship in hospitals without an ASP [1]. We believe that every hospital should implement an ASP, a belief shared by the Centers for Medicare and Medicaid Services, which plans to propose a condition of participation for antibiotic stewardship by 2015 [5]. These ASPs should employ the strategies put forth in stewardship guidelines by the Infectious Diseases Society of America/Society for Healthcare Epidemiology of America and the Centers for Disease Control and Prevention (CDC) [6, 7] and focus their efforts on interventions that have proven to have a robust impact on patient outcomes [8]. In a recent supplement in this journal titled “Antimicrobial Stewardship: Patients Over Process,” Pollack and Srinivasan acknowledge the urgent need to improve antibiotic use in hospitals and cite the CDC’s recommendation that all acute care hospitals implement ASPs [9]. Indeed, in a 2009 survey, the most common barrier cited to lack of implementation of an ASP was a shortage of staff [10], although most institutions have now implemented electronic medical records and/or clinical decision support systems allowing much more efficient, less laborious antimicrobial interventions to be completed [11]. Additionally, costs are also frequently cited as a barrier. In the same supplement of Clinical Infectious Diseases, File et al acknowledge that it has been well documented that ASPs are highly cost effective [12]. They cite published studies that have consistently put the annual cost savings of stewardship programs at $200,000–$900,000. The authors go on to state, “The cost-benefits of antimicrobial stewardship make it an easy sell for hospitals, especially in an era of increasing cost constraints” [12]. File et al also recognize that ASPs will often pay for themselves, through savings in both antibiotic expenditures and indirect costs. They mention smaller institutions that have been successful in implementing some stewardship strategies without formalized ASPs [13]; multiple published accounts of community hospitals successfully implementing ASPs exist as well [14–16].

The second approach is to develop a program to allow antimicrobials to be prescribed only by those physicians who are certified within an institution and have demonstrated the necessary education and competency to truly understand the risks and complexities associated with antibiotic use. These certification programs would be analogous to those proposed by the Institute for Healthcare Improvement [17], The American Society of Clinical Oncology [18], and the American Society of Health-System Pharmacists [19] to ensure the safe and effective prescribing of chemotherapeutic agents. These societies advocate that chemotherapeutic agents should only be prescribed by clinicians who have specific training in their use and that any organization administering chemotherapy drugs should have a credentialing program that clinicians must complete to be permitted to prescribe chemotherapy. In addition, these recommendations require that a certain level of competency be maintained through continuing education and that orders for chemotherapy should only be accepted by the pharmacy if written by these certified prescribers.

It is widely recognized that skill is required to optimally prescribe chemotherapy; moreover, the negative consequences of an inappropriate prescription are likely to only affect that individual patient. The same is not universally appreciated with regard to antimicrobial prescribing, which is done by virtually all physicians, despite the risk of enormous collateral damage as well as severe consequences to the individual patient. Antibiotic use is no longer just “bug-drug combinations” [20]. A thorough understanding of the role of the host and pharmacokinetic–pharmacodynamic relationships of antibiotics is also needed to maximize therapeutic efficacy, minimize adverse events (including Clostridium difficile–associated diarrhea, allergic reactions, drug–drug interactions), and prevent the development of antimicrobial resistance [20, 21]. The current overuse and misuse of antibiotics by under-trained, undereducated prescribers has been linked to the growth of antibiotic resistance and associated with increased mortality, morbidity, length of hospitalization, and healthcare costs [22].

We agree with Hamilton et al that healthcare providers and clinicians should attempt to broaden the reach of antimicrobial stewardship to improve patient outcomes [1]. We believe this can be reliably achieved by implementing an ASP in every healthcare institution and adhering to established stewardship guidelines. Additionally, we propose that the best point-of-prescribing intervention is to limit prescribing to those prescribers who demonstrate the knowledge and skills required to assume such an important responsibility. Such interventions must include not only unit-based inpatient healthcare providers but also prescribers at long-term-care and outpatient facilities of both adult and pediatric patients. This 2-tiered approach will allow us to both protect our patients and extend the lifespan of our antibiotic armamentarium.

Note

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