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Antibiotic Stewardship in Pediatrics

To the Editors:

We read the article by Shan et al[1] regarding risk factors for severe community-acquired pneumonia among children hospitalized with community acquired pneumonia (CAP), younger than 5 years of age. In their article, the authors stated that antibiotic and antiviral therapies helped reduce the risk of progressing into severe CAP requiring intensive care unit admission or suffering poor clinical outcome. In a cohort that 95.3% of the patients had received antibiotic therapy while 64.1% received antiviral treatment, it is not easy to reach to that opinion as they don't have a control group.

The multicenter Centers for Disease Control and Prevention Etiology of Pneumonia in the Community Study was a prospective, population-based surveillance study of greater than 2300 pediatric CAP hospitalizations in the United States conducted from 2010 to 2012 revealed that viruses were identified in greater than 70% of children, whereas bacteria were identified in only 15% of children.[2] Antibiotic therapy rates of the study by Shan et al were far beyond these. To enable responsible antimicrobial use, we all have responsibilities. Actions attempting to influence the behavior of direct prescribers and patients should be taken. Antimicrobial stewardship programs including coordinated interventions designed to improve and measure the appropriate use of antimicrobial agents by promoting the selection of the optimal antimicrobial drug regimens including dosing, duration of therapy and route of administration should be implemented all around the world. There has been a dramatic increase in the emergence of antibiotic-resistant bacterial strains, which has made antibiotic choices for infection control increasingly limited and more expensive. In the United States alone, antibiotic-resistant bacteria cause at least 2 million infections and 23,000 deaths a year resulting in a $55–70 billion per year economic impact.[3]

Shan et al also discussed that younger age, congenital heart disease, respiratory distress symptoms (tachypnea, dyspnea and chest indrawing) at admission, abnormal white blood cells and C reactive protein results and complications were independent risk factors for severe CAP. These studies defining risk factors for severe CAP are very helpful to guide clinicians. Further studies, particularly randomized controlled trials, are warranted in pediatric patients with community-acquired pneumonia to fully elucidate the etiology and to guide therapy.

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In Reply: Antibiotic Stewardship in Pediatrics

***In Reply*:**

As studies reported, antibiotics were prescribed during more than 50% of hospitalizations of children, often unnecessarily,[1] which could be even worse in poorer countries than in richer ones.[2] Many studies showed antibiotic use rates were relatively high in China, especially before the implementation of Antibiotics Stewardship Programs in 2011.[3,4] A multicenter point-prevalence survey in 13 Chinese hospitals showed that 56% of all the inpatients on the day of the survey were receiving antibiotic therapy and the highest rate occurred in intensive care unit (90%).[5] The rates in the study by Shan et al were relatively higher. It was focused on childhood community-acquired pneumonia (CAP) inpatient cases at a tertiary children's hospital between 2010 and 2014. There may be some selection bias, and during the study period in China, the most common pathogen for childhood CAP was bacteria, especially *Streptococcus pneumoniae*, while PCV13 was just introduced into China by 2017. So, it is not appropriate to guide the treatment of the diseases in China according to that in the United States because of the differences of pathogen spectrums between them. Besides, antibiotics were routinely prescribed for early empirical therapy for childhood CAP, and some antibiotics were used for prophylactic treatment. Thus, the high rate may reflect the serious situation of antibiotic use, and this may result in the increasing antibiotic resistance to a certain extent. Further studies are needed to clarify the issue.

As the letter advocates, we all have responsibilities to enable rational use of antibiotics, especially during this serious period when the increasing multidrug resistance has led to a lot of trouble for the selection of optimal antimicrobial drug regimens. It is a difficult and long journey to achieve our common goal. China is estimated to be the second largest consumer of antibiotics, and plays an important role to constrain antibiotic use and combat antimicrobial resistance. Fortunately, the antibiotic use has been improved a lot since the implementation of strict supervision of Antibiotics Stewardship Program (including financially punished audit and feedback) in China.[6,7] The antibiotic use rate decreased in various countries of the world in recent years. Sustained efforts on every side are needed for continuous improvements.

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