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Comment on: Control of extended-spectrum β-lactamase-producing *Klebsiella pneumoniae* using a computer-assisted management program to restrict third-generation cephalosporin use

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Sir,

The recent report by Kim *et al.*[1] represents an interesting attempt to assess the impact of a computer-assisted management program on third-generation cephalosporin use and the incidence of extended-spectrum β-lactamase (ESBL)-producing *Klebsiella pneumoniae* in a Korean teaching hospital. The authors conclude that their intervention study led to a decrease in third-generation cephalosporin use from 103.2 to 84.9 DDD/1000 patient-days and ultimately helped to control the spread of ESBL-producing *K. pneumoniae*.

We would like to comment on some methodological problems with the interpretation of the data. An effect on third-generation cephalosporin use was seen when the average antibiotic use was compared in the pre-intervention and the intervention phase. This approach is, however, strongly discouraged by the authors of the ORION statement for transparent reporting of intervention studies in the field of antibiotic resistance, published in this journal last year, as it does not take into account trends and temporary changes.[2] In fact, just by carefully examining the data provided by the authors in Figure 2 of the article, it is evident that, despite an initial decrease, there was a subsequent increase in the third-generation cephalosporin use during the intervention period to levels higher than before the intervention. It is also immediately apparent that the incidence of ESBL-producing bacteria was highest during the intervention period and only declined in the maintenance period, where third-generation cephalosporin use was even higher than in the pre-intervention period—a finding that is hardly compatible with a successful intervention.

It is true that an interrupted time-series analysis—one of the statistical methods suggested by the ORION statement for intervention studies in the absence of a concurrent control group—would not have been possible due to the lack of a sufficient number of time points. A segmented regression analysis might, however, have been a way to interpret the data more properly.[3]

Other biases may have distorted the study results. For instance, outbreaks tend to cluster in certain wards. Thus, third-generation cephalosporin use aggregated for the entire hospital might not reflect the selection pressure in specific wards where small-scale outbreaks may have occurred, leading to ecological bias.[4,5] Moreover, as antibiotic cross-resistance is frequent for ESBL producers, changes in the use of a single class of antibiotics might be insufficient to decrease the overall selection pressure. Finally, more detailed information about the infection control policy (contact isolation, screening, local or national hand hygiene promotion campaigns) for preventing the transmission of ESBL-producing organisms would have been helpful.

In view of the worldwide increasing prevalence of multiresistant organisms and the link between antibiotic use and resistance, we are in dire need of effective interventions to promote judicious antibiotic use.[6] With the increasing availability of computerized prescription systems in hospitals, computer-assisted decision-making seems a promising tool to control antibiotic use. Studies like the one by Kim *et al*. confirm, however, that despite the use of modern technologies, changing old habits remains a difficult task.

Transparency declarations

None to declare.

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Control of extended-spectrum β-lactamase-producing *Klebsiella pneumoniae* by utilizing a computer-assisted management program to restrict third-generation cephalosporin use—authors' response

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