Pneumonia Prevention to Decrease Mortality in Intensive Care Units

To the Editor—Roquilly et al conducted a systematic review and meta-analysis of 157 randomized, controlled trials that examined the efficacy of multiple strategies for the prevention of hospital-acquired pneumonia (HAP) [1]. Although their analysis yielded some important findings for clinicians, a cautious interpretation is required from a methodological viewpoint.

First, conclusions of systematic reviews should not be derived from exploratory subgroup analyses. Roquilly et al first conducted a meta-analysis of all trials, which used different methods for the prevention of HAP. The authors subsequently conducted exploratory subgroup analyses by some potential effect modifiers in the subgroup of selective digestive decontamination (SDD), the efficacy of which was found to be statistically significant. Based on such an exploratory subgroup analysis, they concluded that SDD with systemic antimicrobial therapy reduced mortality. However, unplanned, exploratory subgroup analyses are observational in nature. These analyses can also increase the chance for multiplicity and the potential for spurious findings; they should not be used for definitive conclusions [2]. Systematic reviews need to base conclusions on prespecified analyses.

Second, the number of trials and number of participants for SDD were much larger than numbers for other options. Roquilly et al admitted that this could have resulted in a higher power for SDD than for other strategies in the limitations section of their study. Given that SDD was a statistically significant option and other methods were not, an analysis to examine the interaction of SDD trials is worthy of consideration.

Finally, we wonder if the authors’ research question can be answered in a meta-analysis. Roquilly et al set out to determine which HAP prevention strategy was the most effective in reducing mortality in intensive care units. The authors pooled trials using different methods for HAP prevention and also conducted pairwise comparisons between the HAP prevention measures and usual care as subgroups. Among these measures, only SDD was a statistically significant HAP prevention measure, which led to their conclusion. However, given the variety of the numbers of the trials for each HAP prevention, the original question was unanswered. A potential study design for their research question could be a network meta-analysis. This approach is reasonable only when the included studies use similar methodologies. We all know that the designs of the studies on HAP prevention measures were diverse across studies, and many of HAP prevention strategies were examined in only a single or a few trials. Thus, a network meta-analysis on this issue is not realistic at this moment either.

We need more research on each HAP prevention strategy before any firm conclusions can be made.

Notes

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Akira Kurishama1 and Seigo Urushidani2
Departments of 1General Medicine, and 2Emergency Medicine, Kurashiki Central Hospital, Okayama, Japan

References


Correspondence: Akira Kuriyama, MD, MPH, Department of General Medicine, Kurashiki Central Hospital, 1-1-1 Mio, Kurashiki, Okayama 710-8602, Japan (nak40448@nifty.com).

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