

## Letter to the Editor

# Trends in sepsis care in Japan: comparison of two sepsis cohort studies conducted by the Japanese Association for Acute Medicine

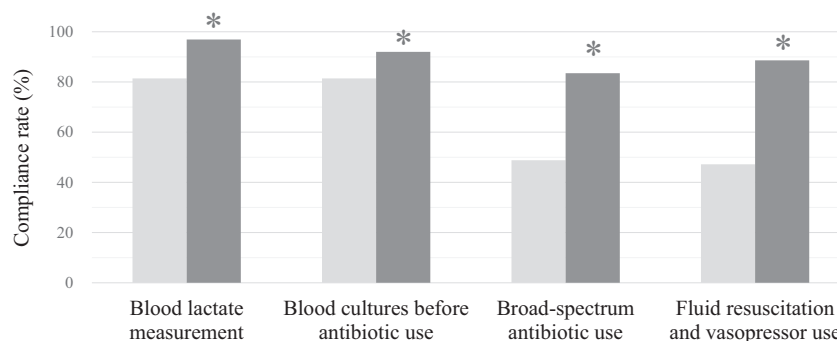
Dear Editor,

After initiation of the surviving sepsis campaign (SSC) and introduction of the SSC guidelines and sepsis bundles, accumulated evidence has shown significant improvements in sepsis outcomes in association with increased bundle compliance.<sup>1,2</sup> However, trends in sepsis care in Japan have not been revealed yet. In 2007, the Japanese Association for Acute Medicine (JAAM) planned two cohort studies on sepsis. The JAAM-SR Basic study was planned to examine the epidemiology and bundle care in as many Japanese hospitals as possible with those in other countries<sup>3</sup> and the JAAM-SR Advanced study was planned for the precise analysis of sepsis demographics, treatments, and outcomes.<sup>4</sup> The initial JAAM-SR Basic study was undertaken between June 2010 and December 2011 and included 1,104 patients with severe sepsis from 39 hospitals.<sup>3</sup> The second study recruited 1,184 patients from 59 hospitals between January 2016 and March 2017 (FORECAST sepsis).<sup>5</sup> These two studies adopted the same inclusion criteria and thus were suitable for a comparative analysis.

Using published data from the two above-mentioned studies, we compared sepsis mortalities and compliance with bundle elements using the  $\chi^2$ -test. The in-hospital mortality rate of sepsis improved by 5.9% between the JAAM-SR Basic and FORECAST studies (323/1,104, 29.3% versus 269/1,184, 23.4%,  $P < 0.0005$ ), whereas that of septic

shock improved by 12.8% (197/484, 40.7% versus 200/718, 27.9%,  $P < 0.0005$ ). We then compared the compliance with sepsis bundles (Fig. 1). The compliance rates for all the four bundle elements in the FORECAST study were significantly higher than those in the JAAM-SR Basic study. Among the bundle elements compared, compliance with broad-spectrum antibiotic use and fluid resuscitation and vasopressor use displayed the greatest improvements in the FORECAST study; the compliance rates of both of these bundle elements were less than 50% in the initial study in 2010. The major limitations of this analysis were potential differences in the participating hospitals, patients' background, and inconsistencies in the bundle elements, such as different time limits for lactate measurements and fluid resuscitation, between the two studies. Lack of data regarding participating hospitals and patients' demographics in the JAAM-SR Basic study also hampered the comparison of the patients' background between the two studies.

Although the direct causal associations between bundle compliance and mortality have not been reported in randomized controlled trials, numerous observational studies have revealed a decreased mortality in association with increased bundle compliance rates worldwide.<sup>1,2</sup> As shown in our present comparative analysis, improved compliance with sepsis bundles was associated with lower in-hospital mortality over a 7-year period in Japan, confirming that the SSC has been



**Fig. 1.** Sepsis bundle compliance in two Japanese cohort studies, the Japanese Association for Acute Medicine [JAAM]-SR Basic study and FORECAST. Compliance with four major sepsis bundles is shown. The light gray bars indicate sepsis bundle compliance in the JAAM-SR Basic study undertaken in 2010, and the dark gray bars indicate compliance in the FORECAST study undertaken in 2017. Compliance with the four sepsis bundles was significantly higher in the latter study than in the former (\* $P < 0.0005$ ).

executed correctly in our country. The JAAM, in collaboration with the Japanese Society of Intensive Care Medicine, has been devoted to propelling the SSC through various activities, including a myriad of sepsis lectures, planning of three multicenter studies on sepsis, and development of Japanese clinical practice guidelines for sepsis management. These efforts may have led to the relatively lower mortality and higher compliance with sepsis bundles that were reported in this analysis. However, these studies included only emergency and critical care centers specialized in sepsis care; sustained efforts to promote the SSC in every field and hospital are mandatory to further improve sepsis outcomes. A part of this manuscript was presented at the 46th annual meeting of the JAAM.






## DISCLOSURE

Approval of the research protocol: The protocols of the two studies were reviewed and approved by the ethics committees of all institutions participating in the JAAM study group.

Informed consent: N/A.

Registry and the registration no. of the study/trial: UMIN-CTR ID: UMIN000008195 (JAAM-SR Basic), UMIN000019742 (FORECAST).

Animal studies: N/A.

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## CONFLICT OF INTEREST

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