Abstract

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Dexmedetomidine improves the survival of patients with severe sepsis through the improvement of renal function: A sub-analysis of a randomized controlled trial

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Objectives:
Dexmedetomidine may alleviate organ dysfunction in critically ill patients. In a recent randomized controlled trial (DExmedetomidine for Sepsis in Intensive care unit [ICU] Randomized Evaluation [DESIRE]), we demonstrated that dexmedetomidine was associated with reduced mortality in patients with severe sepsis. We conducted this sub-analysis to elucidate the mechanism of improved outcomes in patients treated with dexmedetomidine.

Methods:
The DESIRE trial compared a sedation strategy with and without dexmedetomidine on a cohort of 201 mechanically ventilated adult patients with sepsis across eight ICUs in Japan. In this sub-study, we included 104 patients with an Acute Physiology and Chronic Health Evaluation II (APACHE II) scores of >22 (54 in the dexmedetomidine [DEX] group and 50 in the non-dexmedetomidine [non-DEX] group). Initially, we compared the changes in the sequential organ failure assessment (SOFA) scores from the baseline within six days after randomization between groups. Subsequently, we added comparisons of the organs that showed relevant improvement in SOFA scores in the DEX group.

Results:
The mean patient age was 71.0Â±14.1 years. The median APACHE II score was 29. The median SOFA score at baseline was lower in the DEX group (9 vs. 11; P=0.01). Although the renal SOFA score at baseline was similar for both groups, it significantly decreased in the DEX group on day 4 (P=0.02). During the first six days, urinary output was marginally higher (P=0.06) and serum creatinine levels were significantly lower (P=0.03) in the DEX group. Rates of 28-day and hospital mortalities were significantly lower in the DEX group (22% vs. 42%; P=0.03, 28% vs. 52%; P=0.01, respectively).

Conclusions:
A sedation strategy with dexmedetomidine is associated with improved renal function and may decrease mortality rates in patients with severe sepsis.