Distributive shock, especially septic shock, is the most common type of shock in the critically ill patients (1). Distributive shock is characterized by a decrease in peripheral vascular resistance and vasodilation resulting in arterial hypotension. To prevent organ dysfunction, fluid resuscitation and vasopressor infusion are required.

Vasopressin is synthesized by the hypothalamus and released by the posterior pituitary gland. It stimulates V1 receptors located mainly in the smooth muscle cells, V2 receptors located in the renal collecting tubules and V3 receptors located in adenohypophysis. Stimulation of V1 receptors induces vasoconstriction by increasing the cytoplasmic concentration of ionized calcium and activating protein kinase C via a Gq protein as well as different second messengers. There is a relative deficiency of vasopressin in catecholamine-refractory septic shock (2-4). Vasopressin or its analogue terlipressin increased blood pressure in patients with hyporesponsiveness to norepinephrine (5,6).

Actually, norepinephrine is recommended as the first-choice vasopressor in septic shock (7). Adrenergic overstimulation has detrimental effects (8). Vasopressin is an alternative vasopressor proposed to decrease norepinephrine dosage in septic shock (7).

In a systematic review and meta-analysis, McIntyre et al. aimed at determining whether the administration of vasopressin (or analogues) with or without catecholamine with catecholamine alone in patients with distributive shock. Twenty-two studies evaluated patients with septic shock and two studies included patients with vasoplegia after cardiac surgery. Only five studies were multicenter and eight studies were blinded.

Atrial fibrillation was the primary outcome. Lower risk of atrial fibrillation was associated with the vasopressin with data available in 13 studies [risk ratio (RR), 0.77; 95% CI, 0.67–0.88]. In the analysis of the 7 trials at low risk of bias, this association persisted (RR, 0.77; 95% CI, 0.68–0.88). This lower risk of atrial fibrillation with vasopressin was maintained for the subgroup of patients after cardiac surgery (RR, 0.77; 95% CI, 0.67–0.88). For the subgroup of septic patients, there was not significant difference in the risk of atrial fibrillation (RR, 0.76; 95% CI, 0.55–1.05).

Lower risk of mortality at 28 or 30 days was associated with the administration of vasopressin. However, focusing on the 2 trials at low risk of bias, there was not difference in the risk of mortality. Renal replacement therapy was lower with vasopressin in the analysis limited to the 2 trials at low risk of bias. Quality evidence was low or moderate regarding myocardial injury, ventricular arrhythmia, stroke and length of stay in hospital and intensive care unit.

McIntyre et al. should be commended for making a rigorous analysis using a GRADE approach. The major limitation is the variability of studies regarding the number of patients, dosage and duration of vasopressors and design of studies. Few studies are considered at low risk of bias.

The authors carefully analysed the risk of bias for each
study and each variable. Hence, the reader has enlightened results. High-quality evidence was only found for atrial fibrillation.

In conclusion, the addition of vasopressin to catecholamine vasopressors compared with catecholamines alone was associated with a lower risk of atrial fibrillation in patients with distributive shock. This result was driven mainly by the study by Hajjar et al., which weighted for 74.8% of the analysis (10). This study included only patients with vasoplegia after cardiac surgery. Atrial fibrillation is the most common complication in post-cardiac surgery patient. The incidence varies between 20% and 50% (11). The underlying mechanisms are multifactorial including, excessive production of catecholamines but also intraoperative factors (11). Given the weight of this study as well as the specific atrial fibrillation mechanisms after cardiac surgery, the decreased risk of atrial fibrillation associated with vasopressin cannot be generalized to all distributive shock, especially in septic shock. A recent meta-analysis confirmed a lower risk of postoperative complications in cardiac surgery patients (12).

In total, vasopressin is an interesting drug to decrease the risk of atrial fibrillation compared with catecholamines, with an apparent safe profile especially after cardiac surgery. In septic shock, potential benefit of vasopressin remains to be demonstrated.

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None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

References


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