ICU
MANAGEMENT & PRACTICE

VITAMINS Trial: No Significant Benefit of Vitamin C Cocktail

Sepsis is a life-threatening condition that causes nearly one-third to half of all hospital deaths. It is also responsible for more than 5 million deaths worldwide each year. Patients with septic shock are an important subgroup of sepsis. These patients have circulatory and metabolic abnormalities that further increase their mortality risk. New treatments could potentially improve outcomes for such patients.

Over the years, high-dose intravenous vitamin C has been explored as adjunctive therapy in sepsis, mainly because of its anti-inflammatory and antioxidant properties. In a previous randomised trial with 24 patients, high dose intravenous vitamin C was found to reduce organ failure associated with sepsis.

You might also like: #LIVES2019: Vitamin C for Sepsis

Approximately 20% of critically ill patients with sepsis also suffer from thiamine deficiency. Thiamine supplementation has also been shown to improve lactate clearance in such patients. In a before-and-after study of 94 patients with severe sepsis or septic shock, intervention with a combination of high-dose IV vitamin C and hydrocortisone together with thiamine was found to be associated with shorter duration of vasopressor administration and lower hospital mortality. However, in two large multicentre trials, hydrocortisone alone demonstrated efficacy in hastening the resolution of shock compared with placebo.

What was still unclear however was whether the combination of vitamin C, hydrocortisone, and thiamine is more effective than hydrocortisone alone. In the Vitamin C, Hydrocortisone and Thiamine in Patients with Septic Shock (VITAMINS) trial, the effects of vitamin C, hydrocortisone, and thiamine combination therapy on vasopressor requirements in patients with septic shock was examined and compared with hydrocortisone monotherapy. The study hypothesis was that treatment with combination therapy would increase time alive and free of vasopressors as compared to treatment with hydrocortisone monotherapy.

The VITAMINS trial was conducted in 10 ICUs in Australia, New Zealand, and Brazil. 211 patients were included in the trial. All patients were admitted to these ICUs with a primary diagnosis of septic shock (diagnostic criteria was based on the Sepsis-3 consensus and SOFA score). Patients in the intervention group (107 patients) received 1.5 g IV vitamin C every 6 hours, 50mg hydrocortisone every 6 hours, and 200mg thiamine every 12 hours. Patients in the control group (104 patients) received 50 mg IV hydrocortisone every 6 hours. The intervention continued until the cessation of vasopressor administration (discontinuation of all vasopressor drugs for 4 consecutive hours) or when other criteria for stopping the intervention were met.

The primary outcome of the study was time alive and free of vasopressors at day 7. Secondary outcomes included 28-day, 90-day ICU and hospital mortality, 28 cumulative vasopressor-free days, 28-day cumulative mechanical ventilation-free days, 28-day renal replacement therapy-free days, change in SOFA score at day 3, 28-day ICU free days, and hospital length of stay.

Findings of the VITAMINS trial did not show any significant difference in time alive and free of vasopressors up to day 7 after randomisation between the intervention group and the control group. There was also no significant difference in all-cause mortality after 28 days, or at 90 days, or in the number of patients who survived to discharge from the ICU or the hospital. In addition, there was no statistically significant difference in terms of 28-day cumulative vasopressor-free days, 28-day cumulative mechanical ventilation-free days, and 28-day renal replacement therapy-free days.

These findings clearly show that the combination of IV vitamin C, hydrocortisone, and thiamine did not significantly affect the time alive and free of vasopressor support up to day 7 as compared to hydrocortisone alone. Mortality was no different, and neither was artificial organ support.

Source: JAMA
Image Credit: iStock

Published on : Wed, 22 Jan 2020