ICU
MANAGEMENT & PRACTICE

IMMUNOCITRE Trial - Enteral L-citrulline Administration vs Placebo

Critically ill patients admitted to the ICU often experience temporary immune deficiencies, leading to persistent organ dysfunction and a higher risk of ICU-acquired infections. Researchers have been exploring immune-enhancing diets to address these issues, focusing on nutrients like L-arginine. L-arginine is important because it can become deficient in critically ill patients and is associated with worse outcomes.

There have been concerns about using L-arginine-containing formulas in critically ill patients, particularly those with sepsis or septic shock. However, a study with 30 ICU patients found that L-arginine administration increased ornithine synthesis and plasma ornithine levels without affecting L-arginine levels or immune functions. Importantly, the administration of L-arginine did not appear to have a negative clinical impact based on the Sequential Organ Failure Assessment (SOFA) score evaluation.

Recent research also suggests that supplementation with L-citrulline may be more effective at increasing plasma L-arginine levels than direct L-arginine supplementation.

This study aimed to assess if giving L-citrulline to critically ill patients could reduce organ dysfunction, as measured by the SOFA score, and also influence specific immune parameters in patients on mechanical ventilation in the ICU.
The study included 120 critically ill adult patients on invasive mechanical ventilation (without sepsis or septic shock). Researchers compared the effects of enteral L-citrulline (5 g every 12 hours for 5 days) with placebo. The primary outcome was the SOFA score on day 7, while secondary outcomes included SOFA score improvement (a decrease of 2 or more points between day 1 and day 7), acquisition of secondary infections, length of stay in the ICU, plasma amino acid levels, and immune biomarkers (HLA-DR expression on monocytes and interleukin-6) on days 3 and 7.

As per the findings of the study, the primary outcome, which was the assessment of organ dysfunction using the SOFA score on day 7 after enrollment, showed no significant difference between the L-citrulline group (with a median SOFA score of 4) and the placebo group (with a median SOFA score of 4; p=0.9). However, there was a notable increase in plasma arginine levels on day 3 in the L-citrulline group, while immune parameters remained unaffected by the treatment.

Overall, study findings show that in mechanically ventilated ICU patients without sepsis or septic shock, enteral L-citrulline administration did not lead to a significant difference in the SOFA score on day 7 compared to placebo.

Source: Critical Care
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