ARGININE APPEARANCE AND NITRIC OXIDE SYNTHESIS IN CRITICALLY ILL INFANTS CAN BE INCREASED WITH A PROTEIN-ENERGY–ENRICHED ENTERAL FORMULA

bit.ly/Fortini5

de Betue CT, Joosten KFM, Deutz NEP, Vreugdenhil ACE, van Waardenburg DA. 2013

PURPOSE

The amino acid arginine is required for protein synthesis and the production of nitric oxide (NO), an important signalling molecule. It is conditionally essential in critical illness, as arginine production does not meet requirements in states of increased metabolic requirements, e.g. severe inflammation. The present study explored if an energy- and nutrient-dense formula (ENDF), which contains more arginine than a standard infant formula (SIF) due to the increased protein content, can increase arginine appearance and NO synthesis.

DESIGN

Infants with respiratory failure due to viral bronchiolitis were randomly assigned to receive either an ENDF (Fortini™) or SIF for 5 days. A 2 hour stable isotope protocol was used to measure arginine kinetics and metabolism. Phenylalanine and tyrosine tracers were used to assess whole body protein synthesis.

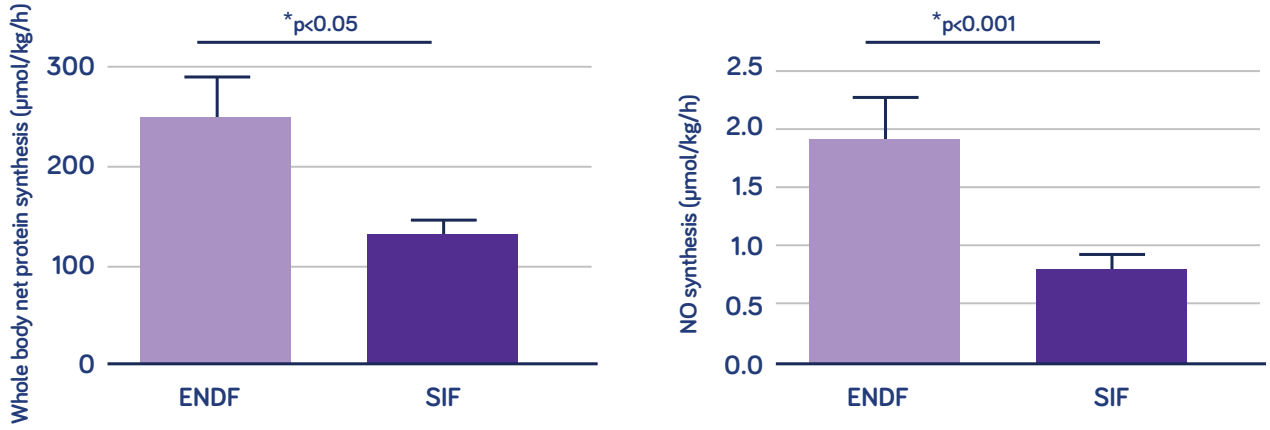
OUTCOMES

The stable isotope tracer protocol was conducted in 18 patients (n=8 ENDF, n=10 SIF). Both formulas were well tolerated. Energy, protein and arginine intakes were significantly higher in the ENDF group. Arginine appearance and NO synthesis was found to be significantly higher with the ENDF group compared to the SIF group (p=0.003). Whole body protein synthesis and net whole body protein synthesis (whole body protein synthesis – whole body protein breakdown) were also significantly higher in the ENDF group.

CONCLUSIONS

This study demonstrates that arginine availability can be increased in critically ill infants with the use of ENDF. In addition to increased arginine appearance and NO synthesis, the ENDF increased protein turnover, synthesis and breakdown, achieving an anabolic state in these infants despite severe acute illness.

MEAN (±SEM) WHOLE-BODY PROTEIN METABOLISM IN CRITICALLY ILL INFANTS RECEIVING ENDF (N = 8) OR SIF (N = 10).



Fortini™ resulted in increased arginine availability (p=0.012) and NO synthesis (p=0.003) vs. SIF. Plasma arginine levels were not significantly increased in the Fortini™ group vs. SIF group.

Fortini is for the dietary management of term infants and young children from 0 to 18 months of age or up to 19.8 lbs (9 kg) with or at risk of growth failure, increased energy requirements, and/or fluid restrictions due to conditions such as: congenital heart disease, chronic lung disease, respiratory syncytial virus, neurological syndrome or neuro-disabilities, cystic fibrosis, non-organic failure to thrive. Fortini is known in other countries as Infatrini. For US healthcare professionals

NUTRICIA Fortini™