

ORIGINAL RESEARCH COMMUNICATION

The gut takes nearly all: threonine kinetics in infants^{1, 2, 3}

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Background: Threonine is an essential amino acid that is abundantly present in intestinally produced glycoproteins. Animal studies show that intestinal first-pass threonine metabolism is high, particularly during a restricted enteral protein intake.

Objective: The objective of the study was to quantify intestinal first-pass threonine metabolism in preterm infants during full enteral feeding and during restricted enteral intake.

Design: Eight preterm infants ($\bar{x} \pm$ SD birth weight: 1.1 ± 0.1 kg; gestational age: 29 ± 2 wk) were studied during 2 periods. During period A, 40% of total intake was administered enterally and 60% was administered parenterally. Total threonine intake was $58 \pm 6 \mu\text{mol} \cdot \text{kg}^{-1} \cdot \text{h}^{-1}$. During period B, the infants received full enteral feeding, and the total threonine intake was $63 \pm 6 \mu\text{mol} \cdot \text{kg}^{-1} \cdot \text{h}^{-1}$. Dual stable-isotope tracer techniques were used to assess splanchnic and whole-body threonine kinetics.

Results: The fractional first-pass threonine uptake by the intestine was remarkably high in both periods: $82 \pm 6\%$ during partial enteral feeding and $70 \pm 6\%$ during full enteral feeding. Net threonine retention was not affected by the route of feeding.

Conclusion: In preterm infants, the splanchnic tissues extract a very large amount of the dietary threonine intake, which indicates a high obligatory visceral need for threonine, presumably for the purposes of synthesis.

Key Words: Threonine • preterm infants • intestine • stable isotopes • nutrition • splanchnic metabolism

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