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ORIGINAL RESEARCH COMMUNICATION

Response of albumin synthesis to oral nutrients in young and elderly subjects[1,2,3]

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Background: The synthesis of albumin after oral ingestion of nutrients provides a means of storing amino acids, which can be made available during periods of fasting.

Objective: This study was undertaken to see whether the response of albumin synthesis to the oral intake of nutrients is compromised in elderly subjects.

Design: Albumin synthesis was determined from the incorporation of 43 mg L-[$^2H_5$] phenylalanine/kg body wt. Eight elderly subjects (aged >60 y) and 8 young subjects (aged 21–35 y) were studied on 3 separate occasions: after the intake of water, a liquid meal (with 15% of energy from protein, 30% of energy from fat, and 55% of energy from carbohydrate), or an isonitrogenous but not isocaloric meal containing only protein.

Results: Mean (±SEM) albumin synthesis, expressed as an absolute rate (ie, the amount of albumin synthesized per day), was significantly lower in elderly subjects (108 ± 7 mg · kg body wt^{-1} · d^{-1}) than in young subjects (141 ± 7 mg · kg body wt^{-1} · d^{-1}). In response to the complete meal, albumin synthesis was significantly increased in both the elderly (144 ± 7 mgkg body wt^{-1} · d^{-1}) and the young (187 ± 11 mg · kg body wt^{-1} · d^{-1}) subjects. The protein component of the meal was sufficient to stimulate albumin synthesis in both the elderly (147 ± 14 mg · kg body wt^{-1} · d^{-1}) and the young (182 ± 6 mg · kg body wt^{-1} · d^{-1}) subjects.

Conclusions: Elderly subjects have lower rates of albumin synthesis than do young subjects during fasting, but they stimulate albumin synthesis proportionately in response to the oral ingestion of protein. The intakes of additional fat and carbohydrate do not stimulate albumin synthesis further.

Key Words: Aging • albumin synthesis • dietary protein • feeding • L-[$^2H_5$]phenylalanine • nutrients

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