Abstract: In hepatic disorders, abnormal plasma amino acid profiles are observed. In this study, we examined whether soy protein isolate (SPI) improved plasma methionine concentration in the model animals. Portacaval shunt (PCS) increased alanine aminotransferase (ALT) activity and methionine concentration in blood of rats fed a 40% casein diet supplemented with 0.6% methionine (casein-M diet). A 40% SPI diet supplemented with 1.28% methionine (SPI-M diet), which contained the same amount of methionine as that in 40% casein-M diet, normalized plasma ALT activity and methionine level in PCS rats. These effects of a SPI diet may be due to its amino acid composition, since an amino acid mixture diet mimicking a 40% SPI-M diet was also effective to hypermethioninemia of PCS rats. To find key enzymes for the beneficial effect of soy protein, we examined effects of a 40% SPI-M or casein-M diet on the activities of three methionine-metabolizing enzymes in liver of PCS rats. A SPI-M diet stimulated only the activity of cystathionine γ-lyase, compared with a casein-M diet. A SPI diet has a preventive effect on hypermethioninemia, at least in part, by stimulating cystathionine γ-lyase activity in liver and may be used for nutritional management of liver disorders with hypermethioninemia. J. Med. Invest. 53: 255-263, August, 2006

Keywords: cystathionine γ-lyase, methionine, portacaval shunted rats, soy protein diet


Animals and PCS operation

R. Shimooka, et al.  
Effect of soy protein on hypermethioninemia

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1) In the case of soy protein intake, the concentration of methionine was increased, but this was not statistically significant. The effect of soy protein intake on the concentration of methionine was not observed. However, it is possible that the effect of soy protein intake on the concentration of methionine may have been underestimated due to the small sample size. Further studies are needed to confirm these findings.

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Experimental diets

Casein and SPI diets supplemented with methionine or cystine:

Amino acid mixture mimicking casein and SPI:

Measurement of methionine concentration

Activities of methionine-metabolizing enzymes and other biochemical analyses

(A) Plasma  (B) Liver  (C) Urine
Statistical analysis

Beneficial effects of soy protein diets on plasma methionine levels in PCS rats

Nutritional status and blood biochemical analysis

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Effects of SPI diets on methionine-metabolizing enzymes in liver

Importance of amino acid composition in SPI diets
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Effect of soy protein on hypermethioninemia

The study investigated the impact of soy protein on hypermethioninemia, a condition characterized by high levels of methionine in the blood. The researchers examined the effects of soy protein intake on methionine levels in a group of individuals with hypermethioninemia.

Results showed a significant decrease in methionine levels after consuming soy protein, indicating that soy protein may be effective in managing hypermethioninemia. The study also highlighted the need for further research to understand the underlying mechanisms and explore the potential use of soy protein as a therapeutic intervention for hypermethioninemia.

Conclusion

The study suggests that soy protein may be a promising intervention for managing hypermethioninemia. Further research is needed to confirm these findings and to develop strategies for the effective use of soy protein in clinical practice.

Keywords: Soy protein, hypermethioninemia, methionine, therapeutic intervention.
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