Branched-Chain Amino Acids (BCAAs) Reduce Liver Cancer

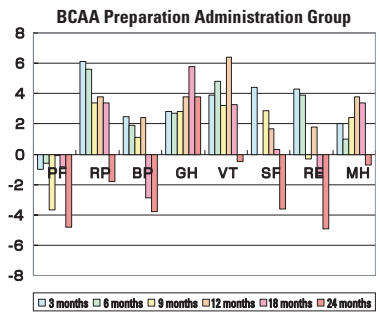
The number of cirrhotic patients in Japan is currently said to range from 300,000 to 400,000. Patients with liver function impaired by cirrhosis suffer from various specific symptoms, including swollen legs and ascites, due to impaired nutritional status. In addition, cirrhosis impairs liver metabolic functions such as ammonia metabolism, leading to fatigue. Further exacerbation of symptoms can lead to significantly impaired nutritional status, hepatic encephalopathy, and liver cancer, eventually leading to death.

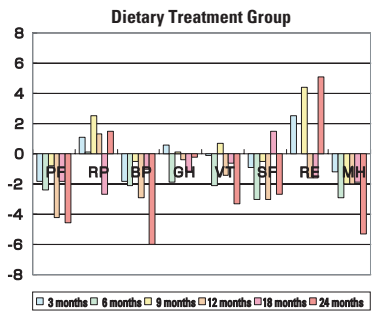
Since cirrhotic patients are characterized by significantly reduced amounts of branched-chain amino acids in the body, they are often treated by administering branched-chain amino acid (BCAA) preparations. A recent clinical trial running for over two years and involving over 600 cirrhotic patients in Japan demonstrated that BCAA administration relieves various cirrhotic-specific symptoms and effectively reduces the risk of liver cancer (Y. Muto et al. /HEPATOLOGY RESEARCH 35 (2006)204-214).

BCAA Improves QOL and Prolongs Life in Cirrhotic Patients

The nutritional status of cirrhotic patients is estimated by determining blood albumin levels. The liver is the only organ capable of producing albumin. BCAAs directly act on the liver to increase the amount of albumin, which helps resolve leg swelling and other symptoms. When liver cells are incapable of adequately metabolizing ammonia, the surrounding skeletal muscle and other tissue help provide an antidotal effect, an effect believed to be indirectly supported by BCAAs. These actions can result in remarkable improvements in various patient symptoms. BCAAs have been shown to be effective among both alcoholic and viral cirrhotic patients. Fig. 1 shows the results of patient QOL evaluations following evaluation by SF-36 (*1). No improvements were observed for most items in the dietary treatment group. In contrast, improvements were observed for many items in the BCAA preparation administration group three months after administration. The results indicate that BCAA contributes significantly to improvements in QOL and prolonged life among cirrhotic patients.

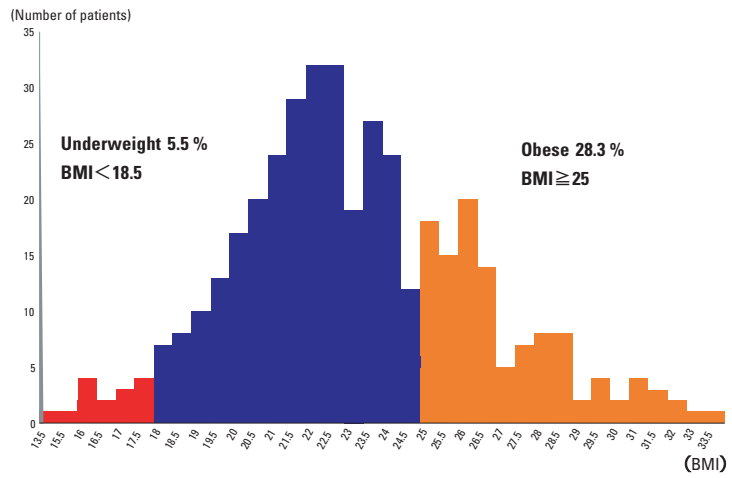
Fig. 1 Improvement of Patient QOL





PF: Physical functioning
RP: Daily role functioning (physical)
BP: Bodily pain
GH: General health perception
VT: Vitality
SF: Social life functioning
RE: Daily role-emotional functioning (psychological)
MH: Mental health

Fig. 2 BMI Distribution of Patients Enrolled in LOTUS Test (Excluding Patients with Severe Edema/Ascites)



*1) SF-36 (MOS Short-Form 36-Item Health Survey): The SF health survey questionnaire is a scientifically valid and reliable scale for measuring QOL for medical evaluations or health-related QOL (HRQOL). Established in the U.S., SF-36 has been thoroughly

reviewed from conceptual design to the psychological-computational verification. It is currently translated into more than 50 languages and used worldwide.

BCAA Inhibits Development of Liver Cancer in Obese Patients Suffering from Ballooning Cirrhosis

Cirrhotic patients are traditionally advised to avoid strenuous activity and to maintain a diet extremely rich in nutrients to help offset potential nutritional problems. In recent years, as with healthy individuals, obese cirrhotic patients have begun to reflect the dietary and lifestyle changes sweeping the broader society (Fig. 2).

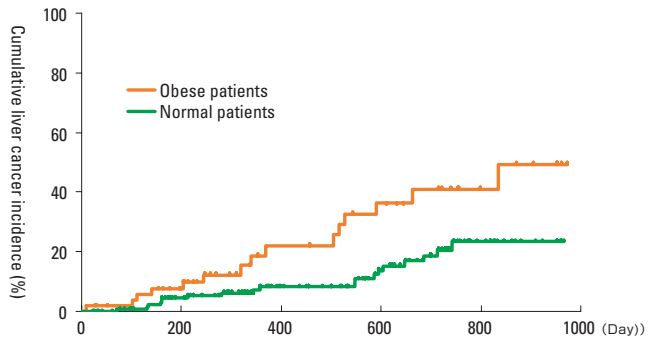
The liver cancer risk of obese cirrhotic patients (BMI ≥ 25) was more than two times greater than that of normal cirrhotic patients (BMI < 25) (Fig. 3). The current experiment shows that administering BCAAs to obese cirrhotic patients mitigates the tendency to develop liver cancer (Fig. 4). Obese patients tend to develop hyperinsulinemia due to impaired insulin function. In addition to reducing blood sugar, insulin can accelerate cancer proliferation. BCAAs are believed to inhibit excessive insulin secretion.

Role of BCAAs in Personalized Medical Care and Prevention of Onset of Cirrhosis in Potential Patients

Traditional treatments and medication have tended to attack specific conditions. But drawing on the latest research, future treatment will likely entail medical care based on a constellation of patient-specific factors and symptoms. Given the rising incidence of cirrhosis among the obese, therapies will increasingly focus on lifestyle changes and adequate exercise, based on specific patient conditions. Adequate exercise is also necessary to prevent the development of alcoholic cirrhosis among potential patients. The role of BCAAs is likely to become increasingly important both among cirrhotic patients and potential patients.

This study was presented by Professor Hisataka Moriwaki of the School of Medicine, Gifu University, on October 29, 2006 at the Liver Meeting 2006, an academic conference on liver diseases held in the U.S. Professor Hisataka Moriwaki's presentation attracted keen interest from many participants.

Fig. 3 High Liver Cancer Incidence Among Obese Patients



Comparison between BMI≥25 and BMI<25 in the dietary treatment group. The cancer risk of obese patients was more than two times higher than that of patients with a normal BMI.

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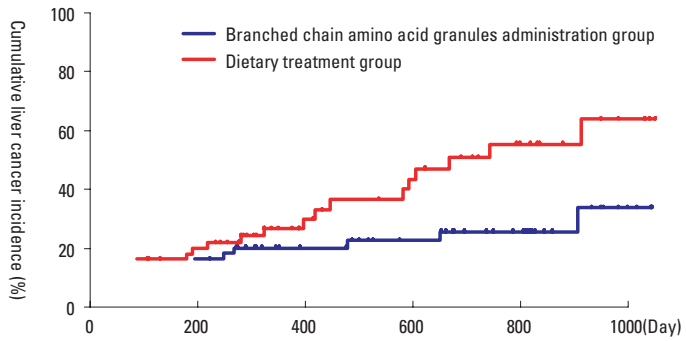
Fig. 4 Transitive Comparison of Obese Patients of Branched Chain Amino Acid Administration Group



The incidence of liver cancer among patients with BMI(25 before test was decreased to one-third its prior rate by the administration of BCAA granules.

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