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## 左卡尼汀治疗对慢性肝病患者的作用

Effect of levocarnitine administration in patients with chronic liver disease

医学及信息部 信息事务组

2020-11-28

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- 左卡尼汀与肌肉减少症和骨质疏松
- 补充左卡尼汀可以改善肝病患者肌肉减少症和骨质疏松症状

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## 小结



# 01

## 文献简介

- 文献概述
- 内容提要



## Effect of levocarnitine administration in patients with chronic liver disease

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**Abstract.** L-carnitine administration was reported to improve sarcopenia in patients with cirrhosis. However, the amount of evidence from previous studies is not sufficient. The present study aimed to clarify the effect of levocarnitine (L-carnitine) administration on body composition in patients with chronic liver disease (CLD). In the present study, 85 patients with L-carnitine administration and 87 control patients were enrolled and divided them into two groups, the L-carnitine administration group (LAG, n=44) and the without L-carnitine administration (controls, n=44) group, by using propensity score matching for age, sex, body mass index (BMI) and serum albumin.  $\Delta$  skeletal muscle mass index (SMI)/year,  $\Delta$  intramuscular adipose tissue content (IMAC)/year and  $\Delta$  bone mineral density (BMD)/year were examined during L-carnitine administration. Each parameter was measured by computed tomography (CT) or dual-energy X-ray absorptiometry. The median age overall was 69 years (IQR, 64.0, 75.0); 36 were men and 52 were women. The median SMI was 37.4 cm<sup>2</sup>/m<sup>2</sup> (IQR, 34.01, 44.34). The initial CT scans showed similar median values of SMI for the two groups [37.74 (34.17, 43.58) and 37.16 (33.83, 44.34), P=0.67]. However, the median  $\Delta$ SMI/year for the LAG and controls

were 0.95% (-3.07, 6.10) and -2.34% (-5.34, 0.53), respectively (P=0.003). The median  $\Delta$  whole body BMD/year for the LAG and controls were -0.24% (-1.20, 0.91) and -1.04% (-2.16, 0.47), respectively (P=0.038). The median  $\Delta$ IMAC/year and  $\Delta$  lumbar spine BMD were not significantly different between the LAG and controls. L-carnitine administration may prevent the loss of skeletal muscle mass and BMD; therefore, it may be used as a new treatment option for osteoporosis and sarcopenia in patients with CLD.

### Introduction

Sarcopenia is defined as a decrease in muscle strength and physical function and skeletal muscle mass depletion (1,2). Primary sarcopenia is caused by aging; secondary sarcopenia is caused by malnutrition, sedentary behavior, and various clinical conditions, such as inflammatory disease, endocrine disease, and liver disease (3,4). The prevalence of sarcopenia in patients with chronic liver disease (CLD) is ranged from 10 to 70% in Japan (4,5). Recent studies have revealed that sarcopenia exacerbates survival, quality of life, and outcome after liver transplant in patients with liver cirrhosis (LC) (6-12). Since hepatocytes perform the function of glucose, lipid, and protein metabolism, liver dysfunction causes a glycogen storage dysfunction in the liver that facilitates the utilization of glycogen and branched amino acid from skeletal muscle, resulting in the progression of proteolysis (13,14). Therefore, preventive treatment is needed to reduce the onset and progression of sarcopenia due to skeletal muscle depletion in patients

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## 左卡尼汀治疗对慢性肝病患者的作用

### Effect of levocarnitine administration in patients with chronic liver disease

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**CLD:** 慢性肝病 (包括慢性肝炎和肝硬化)

**SMI:** 骨骼肌质量指数

**BMD:** 骨密度

**WBBMD:** 全身骨密度

**DEXA:** 双能X线吸收测量法

$\Delta\text{SMI}/\text{年}(\%) = (\text{第二次CT检测的SMI值} - \text{初始检测SMI值}) / \text{初始检测SMI值} \times 100 / \text{检测间隔天数} / 365$

$\Delta\text{BMD}/\text{年}(\%) = (\text{第二次DEXA检测的BMD值} - \text{初始检测BMD值}) / \text{初始检测BMD值} \times 100 / \text{检测间隔天数} / 365$



## 目的

- ✓ 本研究旨在阐明补充左卡尼汀对慢性肝病（CLD）患者身体成分骨骼肌质量和骨密度的影响

## 方法

- ✓ 共纳入88例慢性肝病患者，分为2组，左卡尼汀组44例、对照组（无左卡尼汀治疗）44例

## 检测指标

- ✓  $\Delta$ 骨骼肌质量指数(SMI)/年、 $\Delta$ 骨密度(BMD)/年

## 结果

- ✓ 左卡尼汀组和对照组的中位  $\Delta$ SMI/年分别为0.95% (-3.07, 6.10) 和-2.34% (-5.34, 0.53) ( $P < 0.01$ );
- ✓ 左卡尼汀组和对照组的全身中位  $\Delta$ BMD/年分别为-0.24% (-1.20, 0.91) 和-1.04% (-2.16, 0.47) ( $P < 0.05$ )

## 结论

- ✓ 补充左卡尼汀可以防止骨骼肌和骨密度的丢失，因此，左卡尼汀可以作为慢性肝病患者骨质疏松和肌肉减少症的一种新的治疗选择



# 02

## 文献重点内容

- 肌肉减少症和骨质疏松与慢性肝病（CLD）
- 左卡尼汀与肌肉减少症和骨质疏松
- 补充左卡尼汀可以改善CLD患者肌肉减少症和骨质疏松症状



## - 内容 -

01

### 肌肉减少症和骨质疏松与慢性肝病

- 肌肉减少症在慢性肝病患者中较常见
- 骨质疏松是影响慢性肝病患者健康的重要原因之一

02

### 左卡尼汀与肌肉减少症和骨质疏松

- 左旋肉碱缺乏在慢性肝病患者中很常见
- 左旋肉碱可以通过抑制炎症细胞因子的产生，从而抑制骨质疏松发展过程

03

### 左卡尼汀可以改善肌肉减少症和骨质疏松症状

- 补充左旋肉碱可以抑制骨骼肌和骨密度的丢失





## 定义

- 肌肉减少症是肌肉力量和身体机能下降以及骨骼肌质量减少的一种综合症



## 分类

- 原发性肌肉减少症是由衰老引起的；
- 继发性肌肉减少症是由营养不良，久坐行为和各种临床情况引起的，例如炎症性疾病，内分泌疾病和肝病



## 机制

- 由于肝细胞执行葡萄糖、脂质和蛋白质的代谢功能，肝功能障碍会导致肝糖原储存功能障碍，促进糖原和来自骨骼肌的支链氨基酸的代谢，导致蛋白水解，最终导致肌肉减少症





1

日本慢性肝病(CLD)患者肌肉减少症的患病率为10 - 70%, [1,2]  
肌肉减少症在慢性肝病患者中较为常见

2

肌肉减少症会影响肝硬化患者的生存、生活质量和肝移植后的预后

3

肌肉减少症是影响CLD患者健康的重要原因之一

1. Nishikawa H, et al. Japan Society of Hepatology guidelines for sarcopenia in liver disease (1st edition): Recommendation from the working group for creation of sarcopenia assessment criteria. Hepatol Res 46: 951-963, 2016.

2. Ohashi K, et al. Relationship between sarcopenia and both physical activity and lifestyle in patients with chronic liver disease. J Clin Med Res 10: 920-927, 2018.



# 骨质疏松是影响慢性肝病患者健康的重要原因之一

01

肝硬化患者的骨质疏松患病率约为12-55%，高于健康人<sup>[3]</sup>

02

与肌肉减少症一样，骨质疏松也是影响CLD患者健康的重要原因之一

3. Patel N and Muñoz SJ: Bone disease in cirrhosis. Clin Liver Dis (Hoboken) 6: 96-99, 2015.



## - 内容 -

01

### 肌肉减少症和骨质疏松与慢性肝病

- 肌肉减少症在慢性肝病患者中较常见
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### 左卡尼汀与肌肉减少症和骨质疏松

- 左旋肉碱缺乏在慢性肝病患者中很常见
- 左旋肉碱可以通过抑制炎症细胞因子的产生，从而抑制骨质疏松发展过程

03

### 补充左卡尼汀可以改善肌肉减少症和骨质疏松症状

- 补充左旋肉碱可以防止骨骼肌和骨密度的丢失



## CLD患者 左旋肉碱缺乏



左旋肉碱是人体的一种必需营养素，在脂肪酸 $\beta$ -氧化中起着关键作用



左旋肉碱的来源：1) 在大脑、肝脏和肾脏中合成；2) 从食物中获得



人体内四分之一的左旋肉碱是在肾脏和肝脏中合成的，当肝功能异常时，很容易发生左旋肉碱缺乏，所以左旋肉碱缺乏在慢性肝病（CLD）患者中很常见



# 左旋肉碱可以通过抑制炎症细胞因子的产生，从而抑制骨质疏松发展过程



01

慢性肝病患者骨质疏松的机制之一是通过炎症细胞因子激活破骨细胞，从而导致的骨密度和骨质量下降；

02

左旋肉碱可以通过抑制炎症细胞因子的产生，从而抑制骨质疏松的发展过程



## - 内容 -

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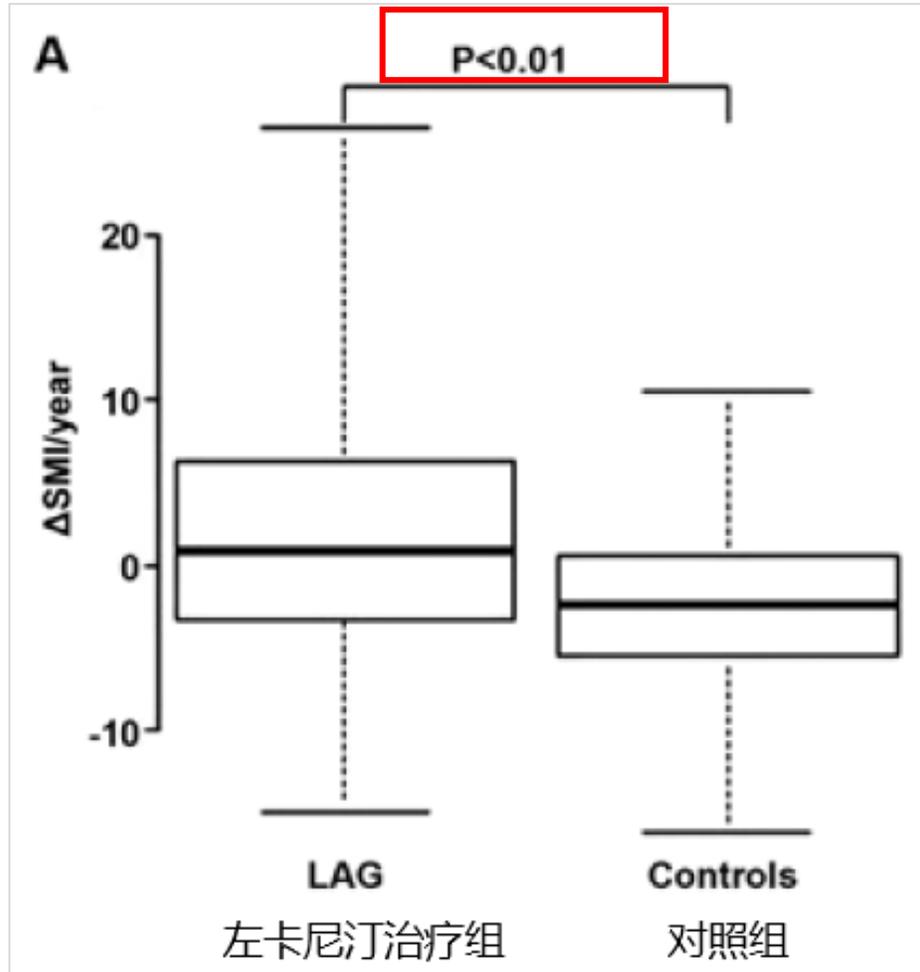
03

### 补充左卡尼汀可以改善肌肉减少症和骨质疏松症状

- 补充左旋肉碱可以防止骨骼肌和骨密度的丢失

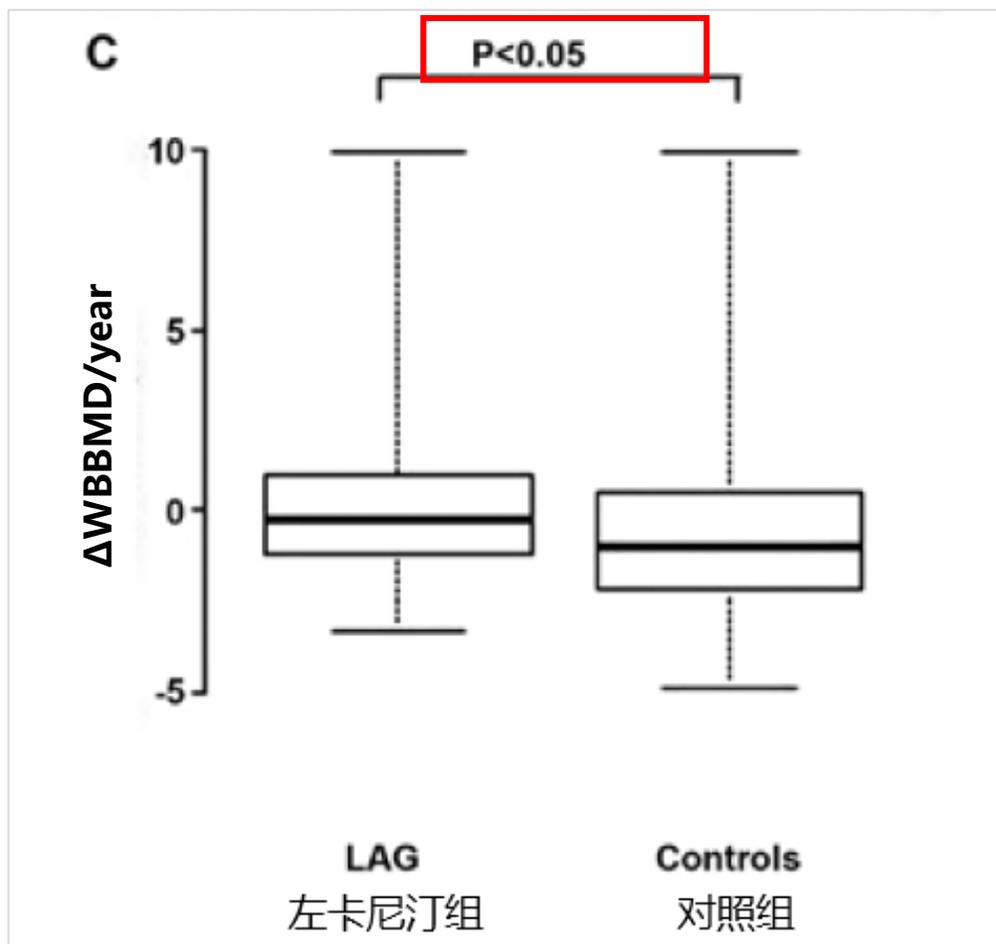


# 补充左卡尼汀可以抑制慢性肝病患者骨骼肌丢失



- ✓ 左卡尼汀组和对照组的中位骨骼肌质量指数 $\Delta$ SMI/年分别为 0.95% (-3.07, 6.10) 和 -2.34% (-5.34, 0.53)，左卡尼汀组中位 $\Delta$ SMI/年明显优于对照组，两组间有显著的统计学差异 (P<0.01)
- ✓ 结果表明，**补充左卡尼汀可抑制慢性肝病患者的骨骼肌丢失**

# 补充左卡尼汀可以抑制慢性肝病患者骨密度下降



- ✓ 左卡尼汀组和对照组中位全身骨密度 $\Delta$ WBBMD/年分别为 -0.24% (-1.20, 0.91) 和 -1.04% (-2.16, 0.47)，左卡尼汀组中位 $\Delta$ WBBMD/年明显优于对照组，两组间有显著的统计学差异 ( $P < 0.05$ )；
- ✓ 结果表明，**补充左卡尼汀可抑制慢性肝病患者的骨密度下降**

03

结论



- ✓ 与对照组相比, 左卡尼汀治疗后可显著抑制慢性肝病患者骨骼肌质量和骨密度丢失;
- ✓ 补充左卡尼汀有利于改善慢性肝病患者肌肉减少症和骨质疏松症状, 左卡尼汀可以作为慢性肝病患者骨质疏松症和肌肉减少症的一种新的治疗选择。



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