# SOME FACTORS ASSOCIATED WITH NUTRITIONAL STATUS IN PATIENTS WITH CIRRHOSIS AT HMUH Vietnam

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**ABSTRACT**

**Background:** Nutrition mechanism if suitable it will help prolong the life of people with cirrhosis. **Objective:** To identity some related factors in patients with cirrhosis at Hanoi Medical University Hospital -HMUH in 2022. **Study design:** Cross-sectional description. **Results:** A total of 109 patients participated with the male/female ratio of 6.2/1; and the mean age of $54.1 \pm 10.8$. Cirrhosis caused by alcoholism accounted for the highest rate. **Conclusions:** Because of the severe effects of malnutrition on cirrhotic patients, assessment and identify some factors related to nutritional status is very important and necessary.

*Keywords:* Nutritional status, cirrhosis, related factors.

## I. INTRODUCTION

Cirrhosis is being the 15th leading cause of morbidity[1] and 14th most common cause of death worldwide[2]. Global liver cirrhosis deaths increased from around 676,000 in 1980 to over 1 million in 2010 (about 2% of the global total)[3], accounting for 2.2% of deaths years worldwide in 2016 and caused 1.32 million deaths in 2017[1]. Cirrhosis caused 31 million of Disability Adjusted Life Years (DALYs), accounting for 1.6%, and made up 2.1% of the worldwide burden[4]. According to the World Health Organization (WHO), Vietnam has a cirrhosis rate of 5% of the population, in which viral cirrhosis accounts for 40% and alcoholic cirrhosis accounts for 18%. The number of deaths accounts for 3% of all cases caused by diseases[5]. The estimated number of people with decompensated cirrhosis due to hepatitis B was 90704 in 2017 and is expected to increase by 10% by 2030[6].

Nutrition is very important with cirrhosis because it helps the damaged liver to function properly, reduces the risk of infection and ascites, provides daily energy and helps prolong the

life of people with cirrhosis[7]. Malnutrition is a burden in patients with cirrhosis, it is associated with the progression of liver failure and complications including infection, hepatic encephalopathy, and ascites[8]. Complications requiring hospitalization and mortality were higher in malnourished cirrhotic patients than in well-nourished cirrhotic patients[9].

With the increasing number of cases of cirrhosis in Vietnam, identify some factors related to the nutritional status is necessary for timely and reasonable intervention, thereby increasing the number of recoveries and reducing mortality. So, we conducted this study with objective:

*To identity some factors related to the nutritional status in patients with cirrhosis at Hanoi Medical University Hospital (HMUH) in 2022.*

## II. RESEARCH SUBJECTS AND METHODS

### 2.1. Place and time of study

- Location: Department of General Internal Medicine, HMUH.
- Duration: From January to September 2022.

### 2.2. Research subjects

*- Inclusion criteria:*

  + Diagnosed with cirrhosis of any etiology (alcoholism, hepatitis C, cryptogenic/ Non-alcoholic fatty liver disease, autoimmune).

  + Newly admitted to HMUH.

  + Adults ( $\geq$ 18 years old).

  + Agreed to participate in this study.

*- Exclusion criteria:*

  + Patients with Hepatic Encephalopathy, active gastrointestinal bleeding, acute liver failure, hepatocellular carcinoma.

  + Patients with other co-morbid conditions requiring dietary modification and restrictions.

  + Patients with scoliosis, neuromuscular disorders in the upper limbs, or lack of upper limbs.

  + Mute, deaf, neurological disorders, or other medical conditions that would prevent understanding for food records and answers' provision or anthropometric measurements.

### 2.3. Research Methods

*2.3.1. Research design*

Cross-sectional descriptive study

*2.3.2. Sample size*

$$n = Z^2_{(1-\alpha/2)} \frac{p\,(1-p)}{d^2}$$

n: quantity to be investigated

Z: 95% confidence level, Z=1.96

P=0.6 (proportion of malnourished cirrhotic patients according to Subjective Global Assessment (SGA) at HMUH in 2020)[10]

d=0.1 is the difference between sample and population

247

### *2.3.3. Sampling method*

Convenient sampling method

## 2.4. Research variables and indicators

• General information of subjects

• Patient's nutritional status: BMI, SGA, biochemical tests.

• Child-Pugh-Turcotte classification (CPT): A, B or C

## 2.5. Data analysis

REDCap was used to enter all variables. Stata version 15.0 will be used for data analysis.

## III. RESULTS

## 3.1. General characteristics of the subjects

*Table 3.1 Demographic characteristic of the participants (n=109)*

| General information | | n | % |
|---|---|---|---|
| Age<br>Mean + SD<br>54.1 ± 10.8 | 18 -30 years | 1 | 0.9 |
| | 31-40 years | 9 | 8.3 |
| | 41-50 years | 21 | 19.3 |
| | 51-65 years | 58 | 53.2 |
| | >65 years | 20 | 18.3 |
| Gender | Male | 94 | 86.2 |
| | Female | 15 | 13.8 |
| Ethnic | Kinh | 100 | 91.7 |
| | Other | 9 | 8.3 |
| Residence | Rural | 70 | 64.2 |
| | Urban | 39 | 35.8 |
| Occupation status | Officials | 4 | 3.7 |
| | Farmers | 16 | 14.7 |
| | Worker | 5 | 4.6 |
| | Retirement | 11 | 10.1 |
| | Freelance | 47 | 43.1 |
| | Other | 26 | 23.8 |
| Level of education | Primary school | 8 | 7.3 |
| | Junior high school | 34 | 31.2 |
| | High school | 47 | 43.1 |
| | Intermediate College | 13 | 11.9 |
| | University /Postgraduate Degree | 7 | 6.4 |

The proportion of male and female were 86.2% and 13.8%, respectively. The mean age of the subjects was 54.1±10.8. The 51-65 year old group accounted for the majority (53.2%). Regarding the current residence, 35.8% of subjects are living in city and 64.2% living in

248

countryside. Most of the subjects have high school level (43.1%). The majority of subjects were freelance (43.1%), the lowest rate for officials (3.7%).

## 3.2. Factors related to the nutritional status of patients with cirrhosis

*Table 3.2. Associated between nutritional status according to SGA and residence*

| Methods | Reference | Residence | | p |
|---|---|---|---|---|
| | | Rural (n,%) | Urban (n, %) | |
| SGA | Well-nourished (A) | 41 (66,1) | 21 (33.9) | > 0.05 |
| | Malnourished (B+C) | 29 (61.7) | 18 (38.3) | |
| Albumin (Alb) | Well-nourished (≥35g/l) | 24 (66,7) | 12 (33,3) | > 0.05 |
| | Malnourished (<35g/l) | 46 (63.0) | 27 (37.0) | |

According to SGA, serum Albumin, the proportion of subjects at risk of malnutrition living in city: 38.3%, 37% and living in countryside, respectively are 61.7%, 63%. These differences were not statistically significant with p>0.05.

*Table 3.3. Diagnosis of malnutrition in accordance with the severity and the etiology of cirrhosis, and with the gender of patients with cirrhosis*

| Methods | Malnutrition | Cirrhosis severity (Child Pugh) | | | Etiology of cirrhosis | | Gender | |
|---|---|---|---|---|---|---|---|---|
| | | A n=48 (%) | B n=47 (%) | C n=14 (%) | Non-Alcoholic n=54 (%) | Alcoholic n=55 (%) | Male n=94 (%) | Female n=15 (%) |
| SGA | Moderate (B) | 13 (27.1) | 23 (48.9) | 9 (64.3) | 17 (31.5) | 28 (50.9) | 40 (42.6) | 5 (33.3) |
| | Severe (C) | 1 (2,1) | 0 (0) | 1 (7.1) | 1 (1.9) | 1 (1.8) | 1 (1.1) | 1 (6,7) |
| Albumin | Mild | 21 (43.8)* | 22 (46.8) | 3 (21.4) | 26 (48.1)* | 20 (36.4) | 39 (41.5) | 7 (46.7) |
| | Moderate | 1 (2.1) | 14 (29.8) | 10 (71.4) | 6 (11.1) | 19 (34.5) | 23 (24.5) | 2 (13.3) |
| | Severe | 0 (0) | 1 (2.1) | 1 (7,1) | 2 (3.7) | 0 (0) | 1 (1.1) | 1 (6.7) |

*p<0.05

In relating the nutritional state of the patients to the severity of the hepatic dysfunction, a greater number of malnourished and of severely malnourished patients was observed by SGA, respectively, in Child-Pugh C (10/14; 1/14, p>0.05) and B (23/47; 0/47, p>0.05) than in A (14/48; 1/48, p>0.05). Analysis of Alb results showed that there was a greater number of patients with values compatible with mild and moderate and severe malnutrition, respectively, in Child-Pugh C (3/14; 10/14; 1/14, p>0.05) and B (22/47; 14/47; 1/47, p>0.05) and A (21/48, p<0.05 and 1/48; 0/48, p>0.05).

In relating the diagnosis of the nutritional state of the patients to the HC etiology, a greater number of malnourished and severely malnourished patients was observed by SGA, among those of the group with non- alcoholic etiology HC (18/54; 1/54, P>0.05), than among those with alcoholic etiology (29/55; 1/55, p>0.05). Analysis of levels of Alb showed no significant difference in the frequency of diagnosed malnutrition regarding the alcoholic or non-alcoholic etiology of HC. By analyses of the SGA, a greater frequency of diagnosis of malnourishment was verified, among women (41/94, p>0.05) than among men (6/15). The analysis of Alb showed the diagnosis of the nutritional state among men and women, while in men (63/94, much higher than in women 10/15).

*Table 3.4. Associated between multiple factors which are common to the underlying disease directly contribute to malnutrition and the SGA of patients with cirrhosis.*

| | SGA | | | p |
|---|---|---|---|---|
| | Well-nourished (SGA-A) n=62 | Mild/Moderately malnourished (SGA-B) n=45 | Severe malnourished (SGA-C) n=2 | |
| Dry mouth | 21 (33.9) | 32 (71.1) | 2 (100) | <0.05* |
| Taste alteration | 2 (3.2) | 18 (40.0) | 1 (50.0) | <0.05* |
| Vomiting | 10 (16.1) | 17 (37.8) | 1 (50.0) | <0.05* |
| Diarrhea | 9 (14.5) | 14 (31.1) | 1 (50.0) | >0.05 |
| Constipation | 3 (4.8) | 7 (15.6) | 0 (0) | >0.05 |
| Poor fitting or no dentures / poor dental health | 4 (6.5) | 8 (17.8) | 1 (50.0) | <0.05* |
| Food allergies or intolerance | 3 (4.8) | 11 (24.4) | 1 (50.0) | <0.05* |
| Transportation problems | 16 (25.8) | 19 (42.2) | 2 (100) | <0.05* |
| Inability to prepare meals | 27 (43.5) | 27 (60.0) | 2 (100) | >0.05 |
| Loneliness and /or depression | 15 (24.2) | 31 (68.9) | 2 (100) | <0.05* |
| History of over-the-counter drugs | 4 (6.5) | 10 (22.2) | 2 (100) | <0.05* |
| Acute or chronic pain | 37 (59.7) | 37 (82.2) | 2 (100) | <0.05* |
| History of surgery/trauma | 16 (25.8) | 8 (17.8) | 2 (100) | <0.05* |
| Multiple medications | 31 (50.0) | 25 (55.6) | 2 (100) | >0.05 |

Our study clarifies that dry mouth (34/47, p<0.001), Inability to prepare meals (29/47, p>0.05), Acute or chronic pain (39/47, p<0.05), Multiple medications (27/47, p>0.05), and Loneliness and /or depression (33/47, p<0.001), are the main risk factors for malnutrition.

## IV. DISCUSSION

### 4.1. Characteristics of patients with cirrhosis

The study was conducted on 109 cirrhotic patients with an average age of 54.1±10.8. This result does not have significant difference with the results of Krishna C, et al on 2.017 cirrhotic patients and the average age was 52±11[11].

The mean weight of male patients was 61.55±7.25 kg; female was 54.67±7.16 kg. The average height of men is 164.45±6.94 cm; of women 153.6±10.64 cm. Comparing with the average weight and height of the Vietnamese person, there is no difference.

## 4.2. Factors related to the nutritional status in patients with cirrhosis

According to the study results, the proportion of cirrhotic patients with malnutrition according to SGA in men with 43.62% and in women with 40%, the malnutrition status according to serum Albumin in male with 67% and female with 66.67%. Compare with the results of the author Vieira et al[13], the proportion of cirrhosis patients with malnutrition according to SGA in male with 52.4% and female with 73.6%, malnutrition status according to serum Albumin in men is 36.4% and in women is 53%. This difference can be explained by the difference in the sex ratio between men and women in different studies, different research subjects, and techniques to assess the nutritional status of collaborators.

Serum albumin was reduced in 73/109 patients (67.6%); 22/48 were Child-Pugh A, 37/47 Child-Pugh B and 14/14 Child-Pugh C. This result is very different from the author Vieira et al[13] that there were absolutely no malnourished cirrhotic patients under the Child-Pugh A classification. The reduction of serum albumin levels in cirrhosis patients, principally among those with moderate or severe hepatic insufficiency, could be associated with either malnutrition, due to reduction in food intake and to the worsening metabolism of nutrients, or with the hepatic dysfunction itself which compromises albumin synthesis.

According to the study results, the most common factors were dry mouth (50.5%), multiple medications (53.2%), Inability to prepare meals (51.4%) and Acute or chronic pain (69.7%). When compared with study of Khalil et al[14], the most common factors are dry mouth (85%), taste alteration (66.7%), food allergies or intolerance (50%), multiple medications (51.7%). It shows that the dry mouth and multiple medications are always the factors that account for a high rate of over 50%. According to SGA, the proportion of malnourished patients in the group of cirrhosis patients with dry mouth was quite high (61.8%, $p<0.001$), cirrhosis patients with multiple medications factor (45.5%, $p>0.05$), however the study showed that although the percentage of cirrhotic patients with taste alteration was 21(19.3%) in a total of 109 study subjects, but the rate of malnutrition in this group of subjects was the highest when there were 19 subjects (90.5%). Dry mouth is a common sign in patients with cirrhosis. Patients with cirrhosis may have difficulty chewing and swallowing dry foods because of the difficulty of moistening food, even with frequent thirst, which sometimes leads taste alteration. Increased dry mouth is associated with an increase in the number of medications used and a decrease in overall health status, particularly contributing to malnutrition.

## V. CONCLUSION

Because of the severe effects of malnutrition on cirrhotic patients, the identify factors related to nutritional status in patients with cirrhosis is very important and necessary. From there, health workers need to consolidate and improve their qualifications and skills in using the SGA toolkit to assess nutritional status and factors related to nutritional status in patients with cirrhosis.

251

**Limitation of this study**

Authors may consider to expand study model for other developing nations

**Acknowledgement**

Thank you editors and friends to assist this publication

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252

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253

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254

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