

Review: Nutrition on Chronic Liver Diseases

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ABSTRACT

Nutritional problems may appear in patients with chronic liver disease and may affect both short-term and long-term clinical outcome of the disease. Especially high incidence of malnutrition, and the complications that result from malnutrition make treatments more complicated among these patients. Therefore, nutritional regulations may play a crucial role in the treatment of chronic liver disease. It is fundamental to determine the nutritional status of all patients with liver disease and to initiate diet treatment as suggested. In this review, recent progress in nutritional assessment, regulations and goals in diet management upon the chronic liver disease are summarized.

Introduction

The relationship between nutritional status and chronic liver disease is vitally important. Most of the chronic liver diseases are closely associated with malnutrition. Especially, end-stage liver diseases and its complications affect both energy consumption and energy metabolism of the body. The liver plays a pivotal role in the metabolism of macronutrients and micronutrients. So nutritional status itself may affect the outcome of chronic liver disease [1]. Furthermore, screening patients for nutritional abnormalities can identify those at risk of developing preventable complications. A targeted goal in nutritional therapy should be to reduce these possible risks and contribute to the recovery [2].

This paper provides an overview of the main nutritional requirements of patients with chronic liver disease and indicates the importance of nutrition therapy in the course of the disease.

Global Burden of Chronic Liver Disease

Liver diseases still represents a considerable public health burden in spite of decreasing prevalence of viral hepatitis in many populations. 'Global Burden of Disease' statistics shows nearly 2 million deaths; nearly 4% of all deaths in worldwide are related to liver diseases [3]. The incidence of alcoholism and alcohol-related liver cirrhosis is still a common problem in many countries. Non-alcoholic fatty liver disease is becoming the most frequent liver disease in United States and in some other Western countries, mostly due to the obesity

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epidemic. Malnutrition is prevalent in all forms of liver diseases independent to its etiologies. Nearly 80% of patients those in advanced stage and 25% of the patients those in early stage of chronic liver disease have some nutritional problems. Usually, patients with end-stage liver cirrhosis have problems of overt cachexia and muscle wasting. However, many patients in early stages may have more subtle problems related to deficiencies of micronutrients.

Goals of Nutritional Regulations

The main aims of nutritional regulations in chronic liver diseases are to aid hepatic healing and regeneration as possible, to prevent and correct protein-calorie malnutrition, and to improve quality of life and prognosis. The nutritional management is also crucial for the treatment of some important complications including as cites, edema and hepatic encephalopathy. To be able to achieve these goals, patients first need an objective assessment of their nutritional status, regular supplementation of macro-and micronutrients when needed, specific regulations for different conditions and most importantly an effective interaction between dietitians and patients.

Nutrition Assessment

Malnutrition prevalence in chronic disease differs according to the hepatic damage and progression of liver disease. It may range from 10% to 100% [4]. Emerging data indicate that 50-100 % of patients with chronic cirrhosis had malnutrition [5,6]. Patients with cirrhosis who are malnourished are likely to have higher incidence of hepatic encephalopathy, infection, variceal bleeding and morbidity. Underlying causes of malnutrition in patients begins with poor oral intake that is arising from multiple factors; changes in the sense of taste, early satiety, and weakness, fatigue and discourage of oral intake. Moreover, malabsorption, increased energy expenditure and altered use of macronutrients metabolism are other reasons conducting to malnutrition [7].

Early diagnosis of malnutrition is important to allow appropriate treatment. The management of malnutrition often starts with identification of nutritional status.

Nutrition status can be directly identified through 4 steps; anthropometric measurements, biochemical and laboratory measurements, clinical measurements and dietary evaluation methods [8]. However in hypervolemic cirrhotic patients it is difficult to identify nutrition status due to disease complications, so there have been some guidelines recommending the use of Subjective Global Assessment (SGA) scale and anthropometric measurements of triceps skinfold thickness, mid-arm circumference and to qualify malnutrition with Bioelectrical Impedance Analysis (BIA) [9].

Nutrition Requirements

Maintenance of a good, well-balanced diet is substantial in the treatment of chronic liver disease. However several conditions that develop in the later stages of cirrhosis require specific dietary requirements. Table 1 summarizes the specific diet regulations in several liver-related conditions.

Energy and Macronutrients

Optimal energy requirements for patients with cirrhosis range from 25-40 kcal/kg/day [9]. whereas European Society of Parenteral and Enteral Nutrition (ESPEN) guidelines suggest 35-40 kcal/kg/day of energy intake [10]. Patients with chronic liver disease who are malnourished must orally meet these recommended caloric needs. Multiple studies on nutritional therapy in liver disease concluded that aggressive nutritional support is necessary to meet elevated energy and protein requirements [11,12]. However use of supplementary enteral nutrition and parenteral nutrition, if necessary, can be included for those who cannot meet their caloric and protein requirement with normal food [9].

The general recommendation for protein intake is 1.2-1.5 g/kg/day. For those patient who cannot succeed to fulfill the recommendation may benefit from Branched-Chain Amino Acid (BCAA) supplementation [10]. In a multicenter randomized trial of patients with de-compensated cirrhosis (n: 656), the supplementation of BCAA (12 g/day) over 2 years was significantly associated with decreased mortality compared with

nutrition support from diet alone [13]. It has been also suggested to decrease the protein intake to 0.5-1.5 g/kg/day for those patients with hepatic encephalopathy to prevent an increase in serum ammonia. However studies have not supported this hypothesis and it has been thought as protein restriction may actually worsen malnutrition in patients with cirrhosis [14].

Carbohydrate is the cornerstone of the diet and should comprise 50-60% of all nutrients. Lipids should provide 10-20% and proteins 20-30% of the remaining nutrients [15]. The distribution of daily intake throughout the day also makes considerable progress. It has been suggested that eating a late evening snack could reduce the length of time a patient fast overnight. In fact, a late evening meal has been shown to improve nitrogen balance [16]. A typical recommendation for patients with cirrhosis is to consume four to five small meals a day, as well as a late evening snack [7].

Micronutrients

Nutrition therapy in patients with chronic liver disease usually focuses on energy, and protein intake for the treatment of malnutrition however it should also consider the specific nutrient deficiencies. Patients with chronic liver disease frequently develop micronutrient deficiencies [7].

Deficiency of iron and water-soluble vitamins are common in cirrhosis and alcoholic disease. Particularly B6, B12 and folic acid deficiency develops in these patients due to decreased hepatic storage levels. These deficiencies may associate with anemia, glossitis, neurological symptoms of patients [17]. Moreover patients with alcoholic liver disease who continue to consume alcohol are especially at risk of fat-soluble vitamins (A, D, E, K) deficiency, in the presence of steatorrhea, together with thiamine, folate and magnesium malabsorption [18]. Zinc and selenium deficiency have also been described in patients with both alcoholic and non-alcoholic liver disease that can induce anorexia, dysfunction of the immune system, dysgeusia and contribute to increase of ammonia levels in circulation [19, 20]. As a result, sufficient

supplementation of these deficient micronutrients must be included in the diet, when necessary.

Fluid and Sodium Restriction

Patients with and edema likely to have an impaired renal handling of water and sodium, which may require their restriction [9].

Patients with ascites and edema should have moderate sodium restriction (80-120 mmol sodium/day or 4.6-6.9 g salt/day). More restriction of sodium is not recommended which may cause food to be less palatable. Therefore, it may decrease the oral intake [21].

Fluid restriction should be considered when sodium levels decrease to less than 130 mEq/L. If sodium declines to less than 120 to 125 mEq/L, it has been recommended to restrict fluid intake to 1-1.5 L/day as a standard practice [22].

Conclusion

Malnutrition and nutritional deficiencies in chronic liver disease are very common and are associated with compromised outcomes in this population. The causes of malnutrition in patients with cirrhosis have a great variety and diagnosis of malnutrition can be challenging in the presence of edema. Even though there is no consensus about the best method for nutrition assessment, the best approach involves the use of SGA scale, specific anthropometric measurements, BIA etc.

Most patients with chronic liver disease can have normal, well-balanced diet with supplements addition, if necessary. Limitations should be individualized based on the disease complications considering extensive restrictions may be harmful. Fluid and sodium restrictions should be considered in the presence of edema as well as by taking attention to renal functions. Additionally, treatment should maintain adequate caloric and protein intake together with fundamental micronutrients. The consumption of frequent small meals including late night snack are recommended to be more efficient. For the patients who cannot meet their daily requirements with normal diet should be supported by enteral and parenteral nutrition. The consultation of the liver patients

with a nutritionist or dietitian should be a crucial part of the clinical management.

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