

## **Protein Recommendations for End Stage Liver Disease Adult Practice Guidelines and Review**

By Jessica Mooney

### **Recommendations**

Safe to feed 0.8 -1.5 g/kg protein per day for majority of patients those that did not improve (showed further signs of higher grade encephalopathy)

- Patients with liver diseases: 35-40 kcal/kg per day
  - 0.8-1.2 g/kg for some cirrhosis patients besides decompensated cirrhosis patients (Those with internal bleeding, ascites, encephalopathy, or jaundice)
  - 1.5 g/kg for situations of stress such as alcoholic hepatitis or sepsis, infection, gastrointestinal bleeding, or severe ascites
- Patients who are at high risk for encephalopathy (those patients showing signs of confusion, changes in sleep, mood, concentration, jaundice, or memory) should be closely monitored.
- Vegetarian diets are sometimes prescribed because of the low ammonia load on plant based proteins
- Rarely BCAA supplementation can have minimal effect on protein status while not aggravating encephalopathy. But other treatment methods for voiding ammonia should be administered first (lactulose and rifaximin)

### **Major Nutritional Goal**

- Avoid malnutrition/starvation(long periods without food)
  - Recommend patient to have a late evening snack to prevent the starvation phase and encourage Breakfast (has been proven to improve cognitive scores)
- Patient should maintain their weight and avoid intentional or unintentional weight loss
- Avoid build up of ammonia in body

### **Branch Chain Amino Acids (BCAA)**

- Can be used by the body without the need of degradation by the liver
  - Some find this the best option for patients with hepatic encephalopathy
- BCAA can be used for patients who have hepatic encephalopathy and physicians are nervous about worsening encephalopathy
- Recommended dosage:

### **Why low Protein Diets are Prescribed**

- An article in 1952 found that two patients on high protein diets that were described to have caused impending hepatic coma and a tremor. This article also stated the lack of reproduction in the same syndrome with other patients in increased dietary protein
- In the hopes to avoid hepatic encephalopathy
  - higher protein intakes lower BUN and creatinine levels
- Protein calorie malnutrition is a strong predictor of mortality and morbidity

### **Liver Disease**

- There are many types of liver disease that all affect the liver in a variety of ways:
  - Acute viral hepatitis, fulminant hepatitis, chronic hepatitis, non-alcoholic steatohepatitis (NASH), alcoholic hepatitis, cirrhosis, cholestatic liver diseases, inherited disorders, and many others

- Cirrhosis patients enter the starvation phase after an overnight fast compared with healthy patients who enter into starvation phase after three days
- Short term survival is reduced when corresponding to malnutrition
- End stage liver disease patients have a hard time flushing ammonia out of the system
  - Source of ammonia are gut production (bacterial and cells), and food
  - Can use lactulose to remove ammonia produced in the gut

### **Issues that Reduce Protein Availability**

- Cirrhosis is a catabolic disease that increases the breakdown of protein and inadequate synthesis
- Chronic liver diseases can cause abdominal pain, nausea, altered gut motility and bloating thereby decreasing the caloric and protein intake of patients

### **Assessing Protein Status**

- Many traditional malnutrition markers are affected by liver disease.
- Most objective might be anthropometric measurements and dietary intake evaluations to look for malnutrition
- Factors that affected:
  - Body weight: edema, ascites, and diuretic use
  - Creatinine-height index: metabolic end product of creatine synthesized in the liver
  - Nitrogen balance: hepatorenal syndrome can affect the excretion of nitrogen
  - Visceral protein levels: synthesis of visceral proteins is decreased
  - Bioelectrical impedance: invalid with ascites and/or edema

### **Probiotics/Symbiotics**

- Probiotics have been found to alter the gut flora and thereby decrease the ammonia production in patients. While research is not conclusive yet there are many studies supporting the use of probiotics or symbiotics for decreasing ammonia production and increasing cognitive awareness

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