

# Liver Series #3 - Malnutrition

**This is the third article in the liver series and is presented in two parts. In this edition, Part A will look at the prevalence, causes and assessment of malnutrition as a complication of liver disease. Part B will cover treatment options and appear in the next edition.**

Malnutrition is a very common complication in patients with chronic liver disease. The implications are serious, as malnourished patients with cirrhosis have a higher rate of other complications and, overall, an increased mortality rate.

Liver diseases, such as hepatitis C, compromise the functioning of the liver, which then hinders many of the digestive processes and often leads to malnutrition. The vicious circle intensifies as malnutrition further compromises liver function, leading to more severe malnutrition.

The first step in preventing further complications is to screen patients with chronic liver disease for nutritional abnormalities and identify those at risk. Doctors can then start the patient on a programme of nutritional therapy, which can potentially reduce the risk of such complications, and improve the overall mortality rate. Treatment options will be discussed in the next edition.

## Prevalence

Figures showing the prevalence of people with chronic liver disease, who are also malnourished, are high. Around 65-90 per cent of people who have advanced liver disease have a condition called protein-calorie malnutrition (PCM) which means body wasting as a result of dietary deficiency of calories and protein. Patients with chronic liver disease also frequently develop micronutrient deficiencies, such as thiamine, folate, magnesium, zinc and calcium and these deficiencies can lead to even more serious health complications.

Studies also show a link between the severity of the two – as liver disease progresses, so too does the severity of malnutrition. In addition, malnutrition develops in patients with cirrhosis irrespective of the cause of their disease.

## Association with liver disease

Malnutrition is associated with increased morbidity and mortality rates in patients with chronic liver disease. Patients with cirrhosis who are malnourished have

a higher rate of hepatic encephalopathy, infection, accumulation of fluid in the abdomen that doesn't recede, and variceal bleeding (rupture and bleeding of the veins).

While several studies have found a correlation between poor nutritional status and a high mortality rate, there is debate as to whether the higher mortality rate is as a result of compromised nutritional status, or whether patients who die are simply more likely to be malnourished.

## Causes of malnutrition

Not taking in enough food is the main cause of malnutrition for a variety of reasons. One of the main problems is that patients with cirrhosis often quickly feel full when they eat, called 'early satiety', and this is related to complications from an enlarged liver or significant fluid accumulation.

An altered sense of taste can also be a problem for some people. This condition is thought to be related to vitamin A and/or zinc deficiency as a result of malabsorption, and means food does not taste as good and is not appetising, so people eat less.



Patients with chronic liver disease can be asked to reduce or restrict the amount of sodium, protein and fluids they eat and drink, which can also discourage the patient from eating adequately. (Protein restrictions are now not recommended.) Weakness, fatigue, and low-grade encephalopathy can further hamper the situation.

Malabsorption of nutrients can also lead to malnutrition in patients with chronic liver disease. A number of mechanisms contribute to malabsorption:

- Bile-salt depletion – a problem in patients with chronic liver disease – leads to fat malabsorption, and in turn, a deficiency in fat-soluble vitamins A and D.
- Bacterial overgrowth from poor small-bowel motility inhibits nutrient absorption.
- The presence of portal hypertension, which is an increase in blood pressure in the portal vein system, is thought to contribute to the malabsorption of protein.
- Some medications, such as neomycin, can lead to



# and chronic liver disease

malabsorption. Neomycin is used in the treatment of hepatic encephalopathy, which is an altered level of consciousness because of liver failure.

## Nutritional Assessment

Considering the complications created by malnutrition, it's really important for every patient with advanced liver disease to have a thorough nutritional assessment. Doctors usually need to consider a number of factors when assessing patients, as some of the commonly used nutritional assessment techniques used for most patients may not be useful when assessing cirrhosis patients, for example:

- Weight – liver disease often results in sodium and water retention, making weight measurement an unreliable indicator of malnutrition because of fluid accumulation and oedema.
- Protein markers – traditional tests of nutritional status are less reliable in patients with cirrhosis because the typical markers are in fact proteins which are produced in the liver. These concentrations of albumin, pre-albumin, and many other hepatic proteins, are all abnormal in patients with cirrhosis.

A combination of anthropometric measurements – including height, weight and body mass index – can be used in the evaluation of these patients. For example, measurements include skin-fold thickness of triceps – which assesses fat storage, and midarm circumference – which assesses skeletal muscle mass. While useful for detecting changes and identifying trends, these methods are not always good indicators in cirrhotic patients.

## Assessment using combination of techniques

Subjective global assessment (SGA) is a technique that combines multiple elements of nutritional assessment to classify the severity of malnutrition, including:

- Weight loss during the previous six months.
- Changes in dietary intake.
- Gastrointestinal symptoms.
- Functional capacity.
- Metabolic demands.
- Signs of muscle wasting.
- Presence of peripheral swelling.



The SGA is commonly used to detect malnutrition in liver patients as it is simple and cost effective and can be used in patients with fluid retention. However, it is a subjective tool and results can be interpreted differently by different healthcare professionals. Doctors might also use muscle function tests to assess a patient's nutritional situation, for example, hand-grip strength and respiratory-muscle strength, and these are often used in combination with other assessment methods.

Hand-grip strength is a highly sensitive test and might actually overestimate the prevalence of malnutrition, however does appear to offer the best method for predicting complications in patients with advanced liver disease. For example, a study compared SGA, the prognostic nutritional index, and hand-grip strength as predictors of outcome in patients with cirrhosis. In this study, decreased hand-grip strength accurately predicted a poor clinical outcome that was related to a higher rate of complications, whereas SGA and the prognostic nutritional index did not. The prevalence of malnutrition was highest when measured by hand-grip strength, suggesting that hand-grip strength could be the most sensitive technique.

Bioelectrical impedance analysis (BIA) is considered to be an accurate tool in cirrhosis patients who do not have fluid retention. The BIA sends a small amount of current through the body and uses the water content in different types of tissue to calculate fat, lean body mass and body water.

Other more complex assessments of energy metabolism (requirement at rest and increased requirement under stress), and altered fuel consumption are not practical in day-to-day practice but do affect nutritional status.

## References:

*A Guide for Patients with Liver Diseases including Guidelines for Nutrition*. Retrieved from [http://www.dr.falkpharma.com/uploads/tx\\_tocpshoperw/F80e\\_10-11-08.pdf](http://www.dr.falkpharma.com/uploads/tx_tocpshoperw/F80e_10-11-08.pdf)

*ESPEN Guidelines on Enteral Nutrition: Liver disease*. Retrieved from <http://espen.info/documents/enliver.pdf>

*Part 2 of this article will continue in the next edition of Talking hep C, where Dr Weilert will discuss nutritional support for patients with chronic liver disease who are suffering from malnutrition.*

**Written by Dr Frank Weilert,  
Hepatologist at Waikato  
Hospital.**

