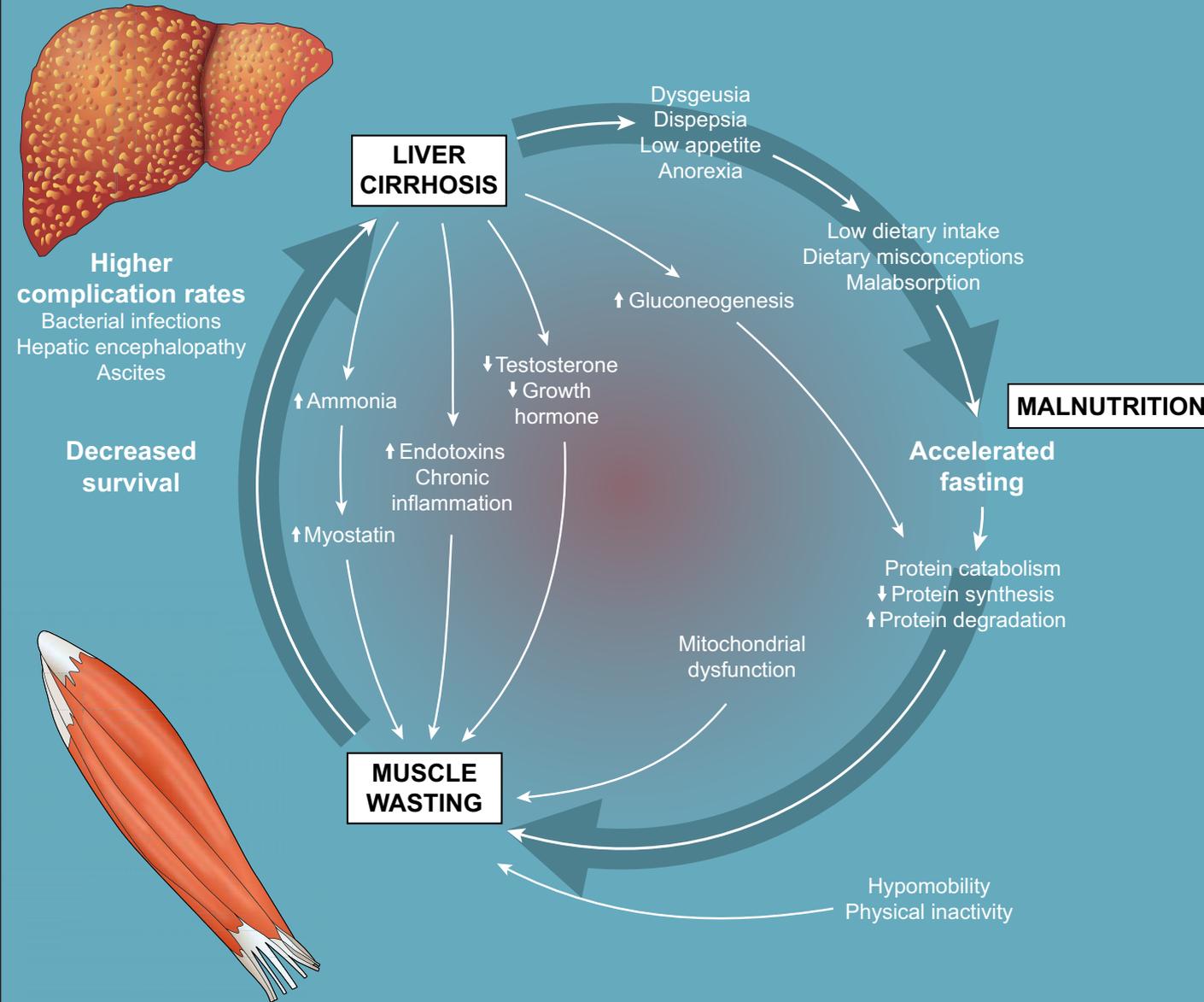


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Screening and assessment for malnutrition

Screening

- Patients at risk for RFH-Nutritional Prioritizing Tool
- Low BMI (<18.5)
- Advanced liver disease (Child-Pugh score C)

Assessment

- Evaluation of nutritional status (Royal Free Hospital Global Assessment)
- Muscle mass (Anthropometry, CT scan, Dual Energy Exchange Absorptiometry, Bioelectrical Impedance Analysis, muscle ultrasound)
- Muscle function (Handgrip test)
- Global physical performance (Time up and go, 6 min walk distance)

DOS

- Take care of malnutrition as you do for other complications of chronic liver diseases.
- Get used to make an assessment of nutritional status with simple methods.
- Inform the patient about the importance of nutrition in chronic liver disease.
- Provide simple messages regarding dietary intake (in non-overweight individuals 30-35 kcal/body weight, 1.2-1.5 g of proteins/kg BW) and meal pattern (avoiding long fasting by having a late evening snack).
- Emphasize the importance of maintaining muscle mass and function by avoiding hypomobility.
- Introduce easy targets for physical activity.

DON'TS

- Approach malnutrition as inevitable consequence of the disease ("Nothing can be done")
- Overload the patient with numerous unjustified dietary or lifestyle restrictions.
- Prescribe low protein diets to prevent or treat hepatic encephalopathy.
- Disregard the detrimental effect of long fasting periods.
- Overlook the relevance of muscle mass depletion on the prognosis in patients with liver cirrhosis.

Background

Nutritional status is often impaired in people with chronic liver disease. The degree of malnutrition increases with increasing hepatic decompensation and has a significant effect on morbidity and mortality, mainly in those patients with refractory ascites, multiple hospitalizations, cholestatic cirrhosis or chronic persistent alcohol abuse.¹ Nevertheless, with the increasing prevalence of obesity, diabetes and metabolic syndrome some patients with cirrhosis may appear overweight or obese despite being malnourished, especially in the setting of non-alcoholic fatty liver disease (NAFLD).²

Causes

Multiple factors contribute to malnutrition in chronic liver disease. Liver impairment results in reduced energy availability and a state of “accelerated fasting” where energy derives from catabolism of adipose and muscles tissues. Indeed, sarcopenia, a depletion in muscle mass and either low muscle strength or low physical performance, is recognized as the “core” of nutritional impairment in chronic liver disease.

Low testosterone, increased endotoxin levels, chronic inflammation, chronic hyperammonaemia, increased myostatin expression and mitochondrial dysfunction have all been suggested as participating players in muscle depletion.³ Hypomobility and physical inactivity may further contribute.⁴ The poor dietary intake commonly seen in patients with decompensated cirrhosis exacerbates the nutritional deficit and is frequently neglected by healthcare providers.

Consequence

Malnutrition in liver cirrhosis is not simply an accompanying condition but further worsens the prognosis of the disease. Malnutrition and sarcopenia are associated with higher complication rates in cirrhotic patients. Moreover, they are associated with increased mortality in hospitalized cirrhotic patients and those waiting for liver transplantation.⁵

Screening and assessment for malnutrition in cirrhosis

Physicians of patients with a diagnosis of chronic liver disease or decompensated cirrhosis should always include the patient's nutritional status in their evaluation. The first step is a rapid nutritional screening to identify patients “at risk”. Patients at risk are those with low BMI (<18), advanced liver disease (Child-Pugh C) and positive RFH-Nutritional Prioritizing Tool.¹ Patients at risk should undergo a more complete nutritional assessment including the evaluation of sarcopenia. Even obese patients may be sarcopenic (sarcopenic obesity) and therefore should be scrutinized as well. Inquiring about dietary intake and food-related attitude and beliefs is recommended.⁶ This can be further assessed through the help of a dietitian.

Sarcopenia

Muscle mass is best assessed by CT-based cross-sectional-imaging, as its results are an independent predictor of a patient's morbidity and mortality.⁶ For this purpose, an abdominal CT taken for the clinical assessment is commonly available. Dual energy X ray absorptiometry scans expose patients to significantly less radiation and have been proposed for the assessment

of sarcopenia through the appendicular skeletal muscle index. Bioelectrical impedance and muscle ultrasound still require further validation. A bedside mid-arm – muscle circumference measurement has also been utilized, although it is limited by intra-operator variability. Completion of the evaluation occurs through assessment of muscle function, by the handgrip test and other more comprehensive physical performance assessments (time up and go or 6 minute walk distance test). Similar tests are also utilized to score a patient's frailty. Increasing frailty in patients with liver disease is associated with worse outcome.⁷

How to treat

Guidelines have underlined the best nutritional approach in patients with cirrhosis.^{1,8} Non-overweight patients should receive a daily intake of 30–35 kcal/kg body weight and daily protein intake of 1.2–1.5 g/kg body weight. An eating pattern including breakfast and a late evening snack is utilized to shorten periods of fasting.⁹ Hospitalized patients are more at risk of a deficient dietary intake. When oral diet is insufficient oral nutritional supplements or enteral nutrition are suggested. Micronutrient malnutrition should also be evaluated and treated. Obese patients with cirrhosis should follow a moderate caloric restriction while maintaining an adequate or even increased protein intake. Recent studies are exploring the possible advantages of adequate protein intake and moderate exercise to improve sarcopenia and frailty.¹⁰

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Conflict of interest

The author declares no conflict of interest.

Please refer to the accompanying [ICMJE disclosure](#) forms for further details.

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Supplementary data

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