CLINICAL PRACTICE GUIDELINES ON NUTRITION IN CHRONIC LIVER DISEASE

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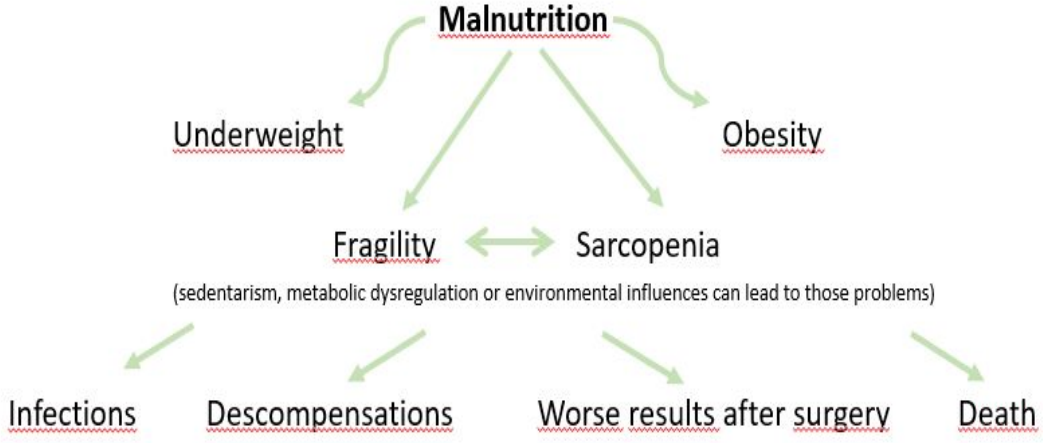
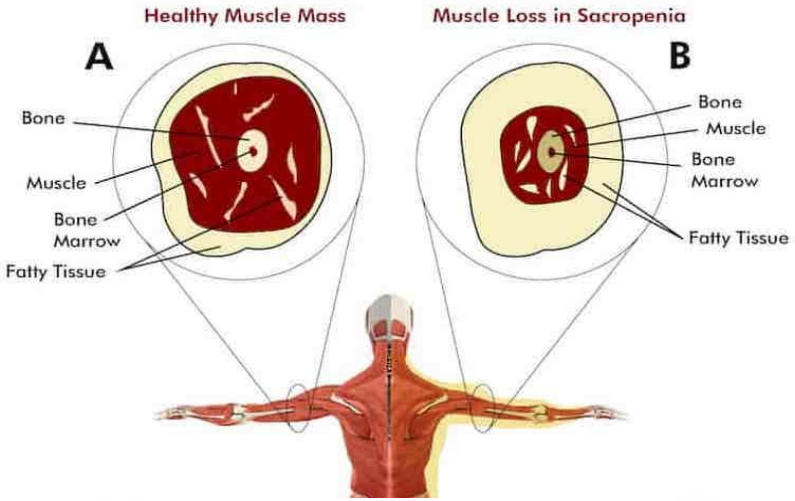
1. Malnutrition and obesity in cirrhosis





Normal Liver

Liver Cirrhosis

1. Malnutrition and obesity in cirrhosis

•Nutritional evaluation
•Questionnaire with 6 questions
•Measure sarcopenia: an image analysis around vertebra L3 or images from a magnetic resonance
50 cm^2/m^2 for man and 39 cm^2/m^2 for woman
•Measure body mass using the average muscle circumference of the arm
•DEXA to measure bone mineral density, fat mass and fat-free mass
•Bioelectrical impedance used to quantify fat-free mass of the extremities

•Clinical fragility range (fragility)
•ADL (fragility)
•Lansky (fragility)
•Fragility in ambulatory patients goes from 17%-43%
•Fragility in hospitalized patients is around 28%
•Obesity incidence 20-35%
•Royal Free Hospital (RFH-NPT) (malnutrition)

•11,8% obesity risk
•BMI <18,5 kg/m^2 and > 40 kg/m^2 need a more detailed nutritional evaluation
•Royal Freeh Hospital
•Nutrition Risk Screening-2002
•Liver Disease Undernutrition Screening

2. Nutritional management principles in patients with cirrhosis

- ➔ 35 kcal/kg dry body weight/day. In **AMERICA** energy intake recommendations may be modified to 25-35 kcal/kg a day for patients with BMI 30-40 kg/m2 and 20-25 kcal/kg/day for individuals with BMI ≥40 kg/m2
- ➔ 1,2-1,5 g/kg a day of protein  (to avoid the risk of sarcopenia)
- ➔ Divide the intake in 3 principal foods (breakfast, lunch and dinner) and 3 middle intakes between the principals.Multiple, small, frequent meals (4–6 hourly)

LAST INTAKE (because patients are going to spend the whole night without eating)

- ➔ Diabetes or obesity would need dietetic settings
- ➔ Abundant salt  is not recommended

3. Sarcopenia in cirrhotic patients

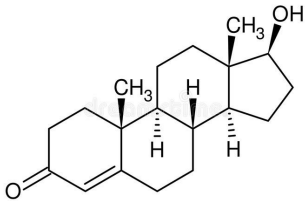
To increase muscle mass in **Europe** they use oral supplementation of branched chain aminoacids, enteral and parenteral diet in a short-term and aerobic and anaerobic workouts while in **America** they are doing studies with testosterone hormones and in **India** they sometimes use drug therapy and Inmunonutrition with glutamine and arginine, fatty acid omega-3 and nucleotides.

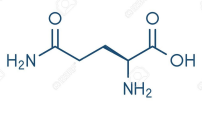
America

•Sarcopenia affects to 30-70% to patients with hepatic disease, being 21% woman and 54% man. In children 17-40%.

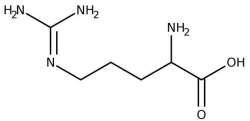
India

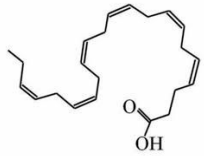
•76% of Indian population are sedentary.





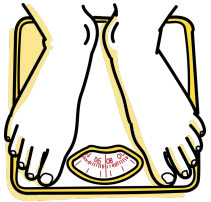
glutamine





4. Approach and management of obesity in patients with cirrhosis

- ➔ It is suggested that a reduction in body weight improves outcomes in obese patients with compensated cirrhosis (progressive weight loss greater than 5-10% in obese cirrhotic patients)



- ➔ Dietary intake should ensure both moderate caloric restriction, and adequate protein intake in order to prevent sarcopenia. In **AMERICA** they recommended with combination of an exercise program. It has to be done by a multidisciplinary team

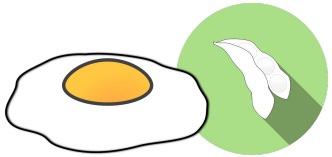
- ➔ According to a 2015 study, the prevalence of obesity in **INDIA** is about 11.8%, and it was estimated that there were more than 135 million people affected by obesity in India so dietary changes and adjustments should be made

5. Micronutrients

VITAMINE	SYNTOMS	COMMENTS
Vitamine A	Ocular changes, skin prblems and growth delayed	If it is not enough with Vit A, also give zinc. Risk of intoxication.
Vitamine D	Bone pain, muscle debility, anorexia, hair loss, bad wound healing	Administration of calcium to people with low mineral bone density
Vitamine E	Hemolytic anemia, muscle pain	Deficiency not very common
Vitamine K	Bleed	Quickly deficiency because Vit K does not storage
Vitamine B1	Wernicke encephalopathy, Korsakoff syndrome, muscular debility	Asymptomatic: 100mg/day
Vitamine B3	Muscle weakness, oral changes	1-5 mg/day High dose can reduce zinc absorption
Vitamine B12	Oral changes, muscle weakness, macrocytic anemia, neurologic symptoms	High risk of deficiency in patients with low gastric acid secretion
Vitamine C	Anemi, oral changes	500-1000 mg/day. Critical patients need extra supplementation
Zinc	Alopecia, altered smell and taste	30-50 m g/day
Selenium	Cardiomyopathy, skin changes	Deficiency not very common
Copper	Hypercholesterolemia, nerurologic changes	Very common after bariatric surgery

6. Nutritional treatment options for hepatic encephalopathy

- ➔ Patients should be advised to divide their caloric and protein intake into small, frequent meals. It is advisable that breakfast and afternoon snack also include protein
- ➔ Encourage the consumption of vegetables and dairy proteins

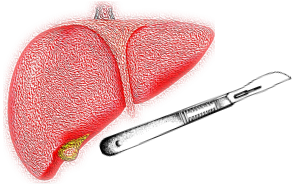


- ➔ Optimal daily protein and energy intake should not be less than the general recommendations for cirrhotic patients

- ➔ **INDIA (related to children):** High calorie intake 120-150 kcal / kg / day (up to 150 times the recommended daily dose for the age) comprising carbohydrates **15-20** g / kg a day, proteins **2-4** g / kg a day and fats **8** g/ kg a day

7. Clinical scenarios requiring special considerations

EUROPE



Malnutrition in patients undergoing liver transplantation and / or liver surgery

<u>Preoperative nutrition</u>

- ➔ Sarcopenia may receive nutritional treatment before elective surgery, as this will improve body protein status and clinical outcomes
- ➔ Before the operation:
  If the **GOAL** of treatment is to **maintain nutritional status**, plan a total *energy* intake of 30 kcal / kg of body weight / day and a *protein* intake of 1.2 g / kg of body weight / day
  If the **GOAL** is to **improve nutritional status**, plan a total *energy* intake of 35 kcal / kg of body weight / day and a *protein* intake of 1.5 g / kg of body weight / day

<u>Postoperative nutrition</u>

- ➔ Initiate normal feeding with food and / or enteral tube preferably within 12-24 hours postoperatively, or as soon as possible
- ➔ *Energy* intake of 35 kcal / kg of body weight / day and a *protein* intake of 1.5 g / kg of body weight / day is recommended
- ➔ When oral or enteral nutrition is not possible or feasible, parenteral nutrition should be indicated instead of no feeding

7. Clinical scenarios requiring special considerations

Nutrition in the critically ill cirrhotic patient

Maintaining adequate nutritional support is a relevant objective
Direct measurement of caloric requirements by indirect calorimetry
Critical cirrhotic patients more frequently require enteral or parenteral nutrition

Alcoholic liver disease and severe acute alcoholic hepatitis

An early study in alcoholic hepatitis showed that if 70-85 g of amino acids were added to the intravenous infusion, to a 3,000 kcal diet and 100 g of protein for four weeks, the mixture was safe and was associated with a lower mortality rate

INDIA

Postoperative nutrition

- ➔ After liver transplantation, patients should start an early enteral feeding in the postoperative period [less than 12 h after surgery]. In the first 48 h after transplantation of liver, caloric intake should be set at 20 kcal / kg GDP / day, although protein intake should be kept between 1.2 and 1.5 g / kg /day
- ➔ An importance should be given to physical exercise to improve muscle strength
- ➔ Obese patients with decompensated cirrhosis undergoing liver transplantation have high morbidity and mortality, so ideally they would need a reduction of weight before liver transplant

7. Clinical scenarios requiring special considerations

AMERICA

- Liver *transplantation* may offer indirect benefits to improve frailty and / or sarcopenia in recipients, but cannot be specifically recommended for the treatment of these two conditions
- *ASCITES:* fluid retention should be optimized since ascites and edema cause early satiety, limit exercise capacity and compromise mobility
- In *critically* ill patients with *cirrhosis*, a higher protein target of 1.2-2.0 g / kg ideal body weight / day is recommended
- In hospitalized patients with *decompensated cirrhosis,* parenteral nutritional support should be considered in those who cannot meet nutritional requirements through oral intake alone and cannot receive enteral nutritional support.

8. Future investigations in liver disease

Europe

Increase the amount of protein and energy

Supplements

Ammonia reduction

Different nutritional recommendations

Exercise

Improving muscle masss and fucntion what for

Best way to calculate energy requirement

8. Future investigations in liver disease

America

Important to have in mind race and clinical acuity because some data can change.

It is also needed more studies in patients with decompensated cirrhosis

Evaluation of the natural progression as well as predictors of accelerated decline.

Antiviral agents, alcohol abstinence or management of ascites should also investigate the impact of those interventions on muscle function and muscle mass.

Develop therapeutics and multimodal strategies related to fragility and sarcopenia. with collaboration across many disciplines and industries

CONCLUSION

¡GRAZIE PER LA VOSTRA ATTENZIONE!