

Abstract

Introduction: Patients with liver cirrhosis face the risk of frailty syndrome, which increases morbidity and mortality. Malnutrition and sarcopenia, leading to low energy reserve, further worsen the prognosis. Yet there was no study focused on the effect of a combined nutritional and exercise intervention in patients with liver cirrhosis. This multimodal approach could significantly contribute to the reduction of complications and decompensation of the disease.

Aim of the study: The main aim was to evaluate the effects of a combined nutritional and exercise intervention on physical condition, nutritional status and quality of life of patients with liver cirrhosis.

Methodology: In the pilot study, 10 patients (9 completed the study) were included with cirrhosis Child-Pugh stage A. Participants received individualized dietary recommendations and education how to perform physical activities tailored to her illnesses. The difference in eating habits was evaluated at the beginning and at the end of the intervention, were performed anthropometric measurements including bioimpedance and sonography of the quadriceps and following functional tests: hand grip strength, five times sit to stand test (5TSSV) and six-minute walk test (6MWT) during three check-ups and laboratory tests at the beginning and at the end of the intervention. And the quality of life test, CLDQ.

Results: Patients completed a questionnaire about lifestyle changes and ability to perform tasks of intervention. It was noted that there was a change in lifestyle and adherence to rehabilitation recommendations, despite movement restrictions. All patients reported that they increased their physical activity and most of them were able to walk a longer distance compared to the beginning of the study.

Functional tests showed statistically significant results: at 6MWT, patients achieved the result 588 m at the beginning and 622 m at the end of the study ($p=0.001$). For the 5TSSV test, the time to get up from the chair decreased from 11.8 s to 10.3 s ($p=0.008$) at the end of the study.

The CLDQ test improved from 151 to 162.8 points ($p=0.049$) at the end of the study.

Analysis of blood tests showed a positive correlation between vitamin A level and prealbumin, while glycaemia remained without significant changes. The level of C-reactive protein decreased at the second examination and the retinol increased slightly. Prealbumin, zinc and vitamin D levels increased during the second examination. Anthropometric measurements and indirect calorimetry did not show statistically significant differences. Nutritional parameters showed a statistically significant increase in protein intake (101.6 g at the end of the study versus 67.5 g at the beginning, $p=0.008$).

Conclusion: The results of a pilot study suggest that a combined nutritional and physical exercise intervention has positive effect on the physical condition, nutritional status and quality of life of patients with liver cirrhosis. Further studies are needed to confirm these findings and assess the long-term.

Keywords:

liver cirrhosis, malnutrition, nutrition in liver cirrhosis, sarcopenia, prehabilitation, exercise intervention, nutritional intervention, hepatic encephalopathy, physical activity