Abstract

Introduction: patients with hepatopathy are at risk of vitamin D deficiency. Vitamin D levels affect, among other things, metabolism and physiological functions of muscle tissue and thus functional fitness. The aim of this study is to assess muscle mass and strength in relation to vitamin D levels and other factors that affect functional physical fitness in patients with cirrhosis, compared to a control group of patients without hepatopathy and other chronic comorbidities.

Methods: 11 patients with liver cirrhosis were enrolled in an observational cohort study compared with 11 controls without chronic comorbidities. Anthropometric and bioimpedance measurements were performed, functional tests, the 6MWT 6-minute walk test, hand grip strength assessment and calorimetry examination were also evaluated, and laboratory parameters were assessed. Study participants completed the CLDQ test, which assessed the quality of life of people with liver disease.

Respondents answered questions regarding lifestyle, eating habits, physical activity and functional physical fitness. For patients with cirrhosis, the Child Pugh score and MELD score were used to assess the progression of cirrhosis.

Results. At the time of the study, the vast majority of patients had a compensated form of liver cirrhosis, Child Pugh A (n=10) and Child Pugh B (n=1).

There was a significant difference in the 6MWT between patients with hepatopathy (449 m) and the control group without hepatopathy (555 m), $p = 0{,}008$. There were no statistically significant differences between the groups in other functional tests. The two groups differed in a number of laboratory parameters. We found an increase in glycaemia, liver enzymes, bilirubin, coagulation INR in patients with hepatopathy, and a decrease in prealbumin, albumin and cholesterol compared to the control group, $p < 0{,}05$. Deficiency in serum vitamin D levels was demonstrated in both groups. The difference between the groups was not statistically significant, but the mean values in patients with hepatopathy were even lower than in controls. We investigated the relationship between vitamin D levels and 6MWT walking score. There was a positive correlation between vitamin D level and the 6MWT walking test score ($r = 0.56$), but it was statistically insignificant, probably because of the low number of measurements. In the CLDQ quality of life test i, patients in the control group had higher quality of life values.

Conclusion: patients with hepatopathy in the functionally compensated stage of cirrhosis have lower functional physical fitness measured by the walking test compared to the control group without hepatopathy. When vitamin D deficiency was found in both groups, no relationship between vitamin D levels and functional fitness tests could be demonstrated. The positive correlation found between vitamin D level and 6MWT was not statistically significant.