Statistical Analysis Plan (SAP)

Official Title: Implications of Fecal Microbiota Transplantation in Modulating the Effects of Liver Cirrhosis

NCT Number: NCT06478602

Unique Protocol ID: No. 3505/15.02.2023

Protocol Date: 10.04.2023

1. Overview

This statistical analysis plan describes the analytical methods used to evaluate the effect of fecal microbiota transplantation (FMT) on liver fibrosis and hepatic encephalopathy in patients with alcohol-associated liver cirrhosis.

Clinical and paraclinical assessments are performed at baseline and at approximately one month (approximately 30 days ± 7 days) after the intervention.

The primary analysis compares the outcomes observed in patients receiving fecal microbiota transplantation with those observed in the control group receiving standard medical therapy.

2. Outcome Measures

Primary Outcome

Liver fibrosis

Liver fibrosis is assessed by measuring liver stiffness (kPa) using transient elastography (FibroScan).

Secondary Outcome

Hepatic encephalopathy

Hepatic encephalopathy is evaluated using the EncephalApp Stroop Test, which allows identification of minimal hepatic encephalopathy and clinical grading according to established diagnostic criteria.

3. Data Summary

Data are summarized as follows:

Continuous variables (e.g., liver stiffness) are reported as median and interquartile range (IQR) due to expected non-normal distribution. Categorical variables (e.g., hepatic encephalopathy grade) are reported as absolute counts and percentages.

4. Statistical Tests

Liver stiffness values (kPa), representing a continuous variable with non-parametric distribution, are analyzed using the Mann–Whitney U test in order to compare the results obtained in the fecal microbiota transplantation (FMT) group with those observed in the control group at approximately one month (approximately 30 days) after the intervention.

Hepatic encephalopathy, expressed as a categorical variable based on clinical grading and cognitive testing, is analyzed using Fisher's Exact Test, allowing comparison between the FMT group and the control group at approximately one month following the intervention.

These statistical methods are selected due to the relatively small sample size and the expected non-normal distribution of the collected data.

A two-tailed p-value < 0.05 is considered statistically significant.

Where appropriate, 95% confidence intervals are calculated.

6. Statistical Software

All statistical analyses are performed using SPSS software, version 24 (IBM Corp., Armonk, NY, USA).

7. Interpretation of Results

A lower liver stiffness value is interpreted as an improvement in hepatic fibrosis.

A lower hepatic encephalopathy grade or improved cognitive test performance indicates clinical improvement.

The statistical approach accounts for small sample sizes and non-parametric data distributions.