

The Gut–Liver Axis in Ulcerative Colitis: How Inflammation, Microbiota, and Environmental Exposures Influence the Risk of MASLD.

Introduction

Ulcerative colitis (UC) is a chronic inflammatory bowel disease characterized by persistent inflammation of the colon. Patients typically experience symptoms such as diarrhea, abdominal pain, fatigue, and weight loss. UC predominantly affects young adults, significantly impacting their quality of life and potentially leading to disability.

Recently, researchers have observed a higher incidence of metabolic-associated fatty liver disease (MASLD, previously known as NAFLD) among UC patients. Notably, this liver steatosis often occurs in these patients even in the absence of traditional metabolic risk factors, such as obesity, diabetes, or dyslipidemia. This finding suggests unique inflammatory mechanisms linking intestinal and liver health, described as the gut–liver axis.

Objective of the project

The aim of this project is to thoroughly investigate why UC patients are more likely to develop MASLD. Specifically, we aim to identify the clinical, immunological, microbiological, and lifestyle-related factors that contribute to the development of liver steatosis in this patient group.

Research methodology

The project will include 240 participants divided into four groups: UC patients with MASLD, UC patients without MASLD, patients without UC and with MASLD and healthy control groups. We will utilize advanced research techniques, including:

- non-invasive liver imaging methods (FibroScan, ATI, MRI-PDFF),
- comprehensive microbiome and mycobiome analyses (composition of intestinal bacteria and fungi),
- extensive inflammatory profiling with over 90 cytokines assessed using the OLINK platform, allowing in-depth evaluation of inflammatory responses,
- body composition analysis, physical fitness testing, and detailed assessments of diet and lifestyle.

Expected outcomes and significance

Our findings will help clarify the mechanisms driving MASLD in UC patients. Understanding these specific pathways can lead to improved diagnostic methods and therapeutic strategies, as well as preventive measures tailored for UC patients at risk of liver disease. Ultimately, this project aims to influence clinical practice standards and improve the quality of life for patients struggling with intestinal and liver disorders.