

Gut microbiota and non-alcoholic fatty liver disease: the imminent threat or eminent care?

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Aims: The aim of study was to analyze the gut microbiota composition with profound analysis of its potential connection with biochemical factors in patients with non-alcoholic fatty liver disease (NAFLD) and healthy subjects.

Methods: The study included 54 patients with NAFLD (34 men, 20 women), average age 46.64 ± 2.52 . The control group involved 32 almost healthy subjects (14 men, 18 women), average age 32 ± 1.54 . Both groups of patients underwent such biochemical evaluation of serum as blood cell count, lipid profile, C-reactive protein, ALT, AST, GGTP, bilirubin, urea, uric acid, albumin, total protein, TNF- α , HOMA index. The diagnosis of fatty liver infiltration was based on liver transient elastography. Determination of microbial composition was carried out by identification of total bacterial DNA, and DNA of Bacteroidetes, Firmicutes and Actinobacteria was performed with quantitative real-time PCR (qRT-PCR), using gene-targeted primers.

Results: The composition of microbiota in patients with NAFLD was: Bacteroidetes 21.1 ± 3.4 , Firmicutes 40.6 ± 2.7 , Actinobacteria 22.1 ± 3.4 , Other 16.1 ± 2.9 , F/B index 4 ± 0.9 . In controls – Bacteroidetes 45.5 ± 5.5 , Firmicutes 33.7 ± 3.4 , Actinobacteria 14.5 ± 2.7 , Other 6.2 ± 0.7 , F/B index 1.8 ± 0.4 . The negative correlational relationship was marked in NAFLD group between Bacteroidetes and Firmicutes ($r = -0.68$), Bacteroidetes and Actinobacteria ($r = -0.56$), Bacteroidetes and F/B index ($r = -0.056$). Actinobacteria in NAFLD group correlated with TNF- α ($r = 0.41$, $p < 0.05$). F/B index was in strong relationship with ALT ($r = 0.61$, $p < 0.05$), TG ($r = 0.53$, $p < 0.05$), VLDL ($r = 0.4$, $p < 0.05$).

Conclusion: Actinobacteria range and F/B index in patients with NAFLD was above than in patients of control group. Bacteroidetes level in controls was significantly higher than in patients with NAFLD. The Actinobacteria growth in patients with NAFLD could provoke the rise of TNF- α – one of the main factors of non-alcoholic steatohepatitis development. F/B index was associated with such inflammation markers as ALT and TG. Actinobacteria and F/B index increasing could be presented as one of the risk factors for fatty liver injuring in patients with NAFLD.

Keywords: non-alcoholic fatty liver disease, gut microbiota, steatosis, sheatohepatitis