Summary

Coeliac disease is a relatively common disorder that has been associated with a worldwide increase in prevalence in recent decades, with potentially serious medical, economic, psychological, and social consequences. At the same time, the high proportion of undiagnosed cases is well known and carries significant additional health risks for the future. In view of this, the introduction of new diagnostic, monitoring and therapeutic options into clinical practice is an important prerequisite for successfully combating this potentially serious disease. The aim of this study was to analyze plasma levels of the amino acids citrulline and ornithine - as potential markers of small intestinal disease activity, marginal zone memory B cell levels - as an indicator of the severity of hyposplenism, and fecal gliadin 33-mer concentration - as an indicator of adherence to a gluten-free diet - in patients followed for celiac disease.

We performed an analysis of patients dispensed in gastroenterology outpatient clinics of the 2nd Dpt of Internal Medicine – Gastroenterology (University Hospital and Faculty of Medicine in Hradec Králové, Charles University). We examined the following number of patients within individual subanalyses: for plasma citrulline and ornithine 94 patients, for hyposplenism 100 patients, for faecal gliadin 33-mer 109 patients. We compared these cohorts of celiac patients with a control group of 35 healthy blood donors.

In the first subanalysis, one of our main findings was statistically significantly lower plasma ornithine concentrations in patients with uncomplicated celiac disease treated with a gluten-free diet compared with healthy controls. Thus, ornithine seems to be a promising and more sensitive indicator of celiac disease activity in this group of patients. In a second subanalysis, we examined and determined the concentrations of B cell subpopulations in peripheral blood of patients with mild (uncomplicated) forms of celiac disease on a gluten-free diet and demonstrated a selective deficiency of memory marginal zone B cells as a picture of functional hyposplenism in this population. Thus, memory marginal zone B lymphocytes may be a tool to assess the functional (immunological) capacity of the spleen in patients with celiac disease. In a third subanalysis, we focused on fecal gliadin 33-mers as one of the new markers of adherence to a gluten-free diet. We have shown that this marker is a relatively reliable indicator of non-adherence to a gluten-free diet and, at the same time, that it can be used as an indirect marker to assess disease activity in terms of the maintenance of an inflammatory state in the small intestine during sustained gluten intake.

Our work confirms the possibility of identifying new indicators of celiac disease activity in terms of assessment of small intestinal integrity and function, immunological potential of the

spleen and monitoring of adherence to a gluten-free diet. The above findings could theoretically allow a more accurate selection of patients who (given the ongoing disease activity) remain at risk of both severe complications of celiac disease and potentially serious infections.