SUMMARY

Introduction: Impairment of intestinal barrier function is involved in pathogenesis of immune mediated diseases (such as type 1 diabetes mellitus or celiac disease) and metabolic diseases (such as type 2 diabetes mellitus).

Aims of study: The first aim was to analyze impairment of mucosal part of intestinal barrier in both type of diabetes and to describe differences when compared to celiac disease, which is a typical condition associated with impairment of intestinal barrier function. The second aim was to find a correlation between duration or compensation of diabetes and intestinal barrier desintegration in patients with both type of diabetes, and to find a correlation between body mass index and intestinal barrier desintegration in patients with type 2 diabetes. The third aim was to assess influence of gluten-free diet on improvement of small intestinal mucosal integrity in patient with celiac disease.

Methods: The study was performed on 166 individuals including healthy controls and five group of patients with: type 1 diabetes mellitus with fading insulitis (T1D), type 1 diabetes mellitus with ongoing insulitus (T1D/INS), type 2 diabetes mellitus (T2D), untreated celiac disease (CLD), and celiac disease on gluten-free diet (CLD-GFD). We tested the marker of epithelial apoptosis – cytokeratin 18 caspase-cleaved fragment (cCK-18), marker of enterocyte damage – intestinal fatty acid-binding protein (I-FABP) and marker of activation of innate immunity – soluble CD14 (sCD14) in sera of studied individuals. Mann-Whitney U test and Pearson correlation coefficients were used for statistical analyses.

Results: We found elevated levels of cCK-18 and I-FABP in T1D and T2D ($p<0.001$), and T1D/INS ($P<0.01$, $P<0.001$). No convincing relationships were observed between tested markers and duration or compensation of diabetes, or BMI in T2D patients. In CLD, we found elevated levels of cCK-18 ($p<0.001$), I-FABP ($p<0.01$) and sCD14 ($p<0.05$) when compared to healthy controls. Moreover, the levels of cCK-18 ($p<0.01$) and I-FABP ($p<0.01$) in CLD-GFD were higher when compared with controls.
Conclusion: We confirmed the impairment of intestinal mucosal barrier integrity in type 1 and type 2 diabetes mellitus, which is of milder degree when compared to untreated celiac disease. Moreover, we found residual impairment of intestinal mucosal barrier integrity in celiac disease treated with gluten-free diet. We documented for the first time seropositivity for sCD14 in untreated celiac disease, and potential usefulness of serum I-FABP as marker of small intestinal damage in diabetes of both types and in celiac disease.

Key words*:* intestinal barrier function, diabetes mellitus, celiac disease, cytokeratin 18 caspase-cleaved fragment, intestinal fatty acid-binding protein, soluble CD14.