SUMMARY

Clinical depression often co-exists with chronic illnesses, which – inter alia – includes diabetes. In the population with chronic illnesses the risk of depression is much greater that in general population. Depression, as one of the complications of diabetes, adversely affects its metabolic control, e.g. through negligence of: self-control, following a proper and balanced diet, administration of medicine according to treating physician's medical advice and regular physical activity. It has been proven that there is a vital link between incidence of depression and ineffective metabolic control of diabetes. In all three: anxiety disorders, depression and diabetes etiopathological inflammatory background exists.

Lysosomal exoglycosidases, including N-acetyl-β-hexosaminidase (HEX), α-fucosidase (FUC), β-galactosidase (GAL), α-mannosidase (MAN) as well as β-glucuronidase (GLU) take part in chemical degradation of tissue glycoconjugates, and some of them – HEX as well as GLU are successful inflammation markers.

The aim of the research was the evaluation of exacerbated degree of anxiety and depression as well as lysosomal exoglycosidases - N-acetyl-β-hexosaminidase (HEX), α-fucosidase (FUC), β-galactosidase (GAL), α-mannosidase (MAN) as well as β-glucuronidase (GLU) along with selected testing parameters (blood count, C-reactive protein, sodium, potassium, creatinine, alanine aminotransferase, aspartate aminotransferase, glycated haemoglobin, lipidogram, TSH) in the blood serum of patients with diabetes type 2 as well as research on the connection between concentration of exoglycosidases and intensification of anxiety and depression symptoms.

The detailed purpose of the research was to compare the results of Hamilton's anxiety rating scale and Hamilton's depression rating scale between the control group and the trial group as well as occurrence, depending on age, weight and the degree of glycaemic control and comparison of intensification of marked exoglycosidases between control and trial group. The correlation between specific exoglycosidases and Hamilton's anxiety rating scale and Hamilton's depression rating scale as well as age, weight and glycated haemoglobin was also analysed. The correlation of parameters of lipid metabolism in the blood serum of trial patients with diabetes type 2 and in control group, correlation of intensification of exoglycosidases in blood serum with occurrence of mental disorders, such as anxiety and/or depression with parameters of lipid metabolism was also tested. The analysis of correlation between habitual smoking with concentration of exoglycosidases was also carried out.

The research was carried out on 80 people, which was divided into 2 groups. The first group, which accounted for 40 people, consisted of patients with diagnosed diabetes type 2. In this group there was 18 women and 22 men, the average age of patients tested in this group was 59 years. The second group consisted of medically sound people, who performed medical tests and were not diagnosed with diabetes type 2 or any other chronic illnesses. Control group consisted of 40 people, including 12 men

and 28 women, and their average age was 46 years.

All of the tested patients had their anxiety and depression symptoms tested using Hamilton's anxiety rating scale (14-item) and Hamilton's depression rating scale (17-item).

Both patients with diagnosed diabetes type 2 and the medically sound volunteers had approximately 20 ml of blood each drawn from their median cubital vein, which was first coagulated, and then centrifuged for 15 minutes (4500 rotations per minute) in laboratory centrifuge. Immediately after centrifugation, part of the serum was used to determine blood count using colorimetric and cytochemical methods, concentration of C-reactive protein (CRP) with immunoturbidimetric method reinforced with latex, sodium (Na), potassium (K) with ion-selective electrode method ISE, creatinine with kinetic colorimetric test method, glycated haemoglobin (HbA1c) with standardization according to ICF, alanine aminotransferase (ALT) with lactate-pyruvate method and aspartate aminotransferase (AST) with glutamate-malate method, lipidogram using enzymatic-colorimetric method as well as TSH by electrochemiluminescence method. With patients from the control group, concentration of fasting glycemia was additionally determined with enzymatic method with hexokinase – the aim of this was to exclude from the test patients with somatic medical conditions, including diabetes. Remaining serum was placed in clean Eppendorf tubes and stored in –80°C until the point of testing of concentration of HEX, FUC, MAN, GAL i GluUA. The concentration of lysosomal exoglycosidases was determined using colorimetric method.

The approval of Bioethics Committee of Medical University in Białystok has been obtained for this research (R-I002/256/2015).

The obtained results allowed to draw the following conclusions:

1. Higher concentration of N-acetyl-β-hexosaminidase (HEX), α-mannosidase (MAN) as well as β-glucuronidase (GluUA) in blood serum of patients with diabetes type 2 indicates significantly higher inflammatory activity with patients with diabetes type 2.
2. Higher concentration of HEX, MAN, GluUA and specifically FUC, indicate positive correlation with intensification of anxiety and depression, which in turn indicates a significant connection between intensification of psychopathological symptoms (anxiety-depressive symptoms) with inflammation in the course of diabetes
3. Higher concentration of exoglycosidases displays a positive correlation with BMI and higher level of triglycerides, which shows a significant link of higher inflammatory activity with patients with diabetes type 2 (and co-existing mental disorders) with metabolic disorders, including lipid metabolism disorders.
4. The test shows common inflammatory etiology of anxiety-depressive and metabolic disorders.