



Fund “Nauka” Project № 20002 Resume – Competition-Based Session 2020:

“Metabolic syndrome in patients with Inflammatory Bowel Diseases”

Project leader: Assoc. prof. Antonia Yordanova Atanassova, MD, PhD, DSc

Metabolic syndrome (METS) is a set of factors that increase the risk of a number of socially significant diseases such as type 2 diabetes, cardiovascular diseases and cancer. It is a global problem in need of more accurate and validated biomarkers. Different organizations (World Health Organization (WHO), European Group for Insulin Research (EGIR), American Association of Clinical Endocrinology (AACE) and International Diabetes Federation (IDF)) give different definitions of METS. METS is a combination of several risk factors, including insulin resistance (IR), central obesity, high triglycerides, dyslipidemia, and hypertension. Results from studies conducted around the world show that the global prevalence of METS ranges from 10% to 84% depending on the ethnicity, age, gender and race of the population.

Obesity is becoming increasingly common in the inflammatory bowel disease (IBD) community. C Reactive protein (CRP), erythrocyte sedimentation rate and fecal calprotectin can also be elevated in the setting of obesity. Transversal imaging methods for diagnosis have reduced accuracy in patients with obesity and IBD. Some IBD medications, including anti-TNF agents, may be less effective in obese patients.

Visceral obesity and high body mass index are predictors of poor surgical outcomes in IBD patients, particularly those with a stoma or those undergoing reconstructive surgery. The non-invasive examination and easy diagnosis of METS in IBD patients is a key point in terms of both the long-term prognosis and the choice of therapeutic regimen. In recent years, it has been established that micro-RNAs are key in cell division, interaction, a major regulatory factor of the innate and acquired immune system, and can serve both for the IBD diagnosis and for the diagnosis of METS. Therefore, their combined application, the validation of this method, is of great importance both for the fundamental knowledge in this field concerning the etiology and pathogenesis of METS and IBD, as well as for the diagnosis and treatment of both diseases. It has been established that some serum micro-RNAs can be used both for the diagnosis of metabolic syndrome and for monitoring the effect of the applied treatment. Inflammatory bowel diseases are increasing worldwide. The presence of metabolic syndrome in patients with chronic inflammatory bowel diseases is associated not only with the use of certain medications such as glucocorticoids, but the presence of this syndrome affects the effect of modern medications, the postoperative period and the prognosis in these patients. On the other hand, there are numerous studies that prove the relationship between Vit D levels, the inflammation in metabolic syndrome and IBD, as well as the relationship with some micro-RNAs, which is determined by its role in the regulation of the immune system. The low levels of vit. D are associated with greater activity and severity of IBD, a more aggressive

course and a poor prognosis of the disease. The combined study of serum levels of micro-RNAs and levels of vit. D in patients with metabolic syndrome and chronic inflammatory bowel diseases will contribute to improving the diagnosis, monitoring and predicting the course of these diseases.

Established scientists, doctoral students and students whose scientific activity is directly related to the activity and results of the current project participate in the research team. Through the implementation of this project, doctoral students and students will develop their scientific developments, which will contribute to their scientific and career development and the acquisition of a higher scientific degree.

Also, team members will acquire skills to work on projects with scientific and practical applicability, which will further help create highly specialized specialists. Through their work on the current project and the acquired analytical knowledge and skills to work with modern non-invasive biomarkers, the members of the scientific team will acquire the qualities of experts in this field.

The application of a panel of new non-invasive biomarkers for the diagnosis of METS in patients with chronic inflammatory bowel diseases will have a significant practical benefit both for determining different therapeutic regimens and for monitoring the effect of a given treatment, change in dietary habits and physical activity, and in need to choose an operative intervention. Early prevention and monitoring of METS in patients with chronic inflammatory bowel diseases will reduce the risk of type 2 diabetes mellitus, cardiovascular and cerebrovascular diseases, as well as the progression of chronic inflammation to dysplasia and neoplasms.

The application of a panel of micro-RNAs will lead to the creation, confirmation and validation of a non-invasive marker for a socially significant syndrome complex, the frequency of which continues to increase and has an impact on both global health and individual diseases. The application of a panel of micro-RNAs will lead to the creation, confirmation and validation of a non-invasive marker for a socially significant syndrome complex, the frequency of which continues to increase and has an impact both on global health and on the evolution and prognosis of individual diseases.

The validation of the developed and implemented algorithm for early diagnosis of the metabolic syndrome will serve as the basis of a dissertation work. At the same time it will be implemented in the daily work of clinicians from various specialties, cardiologists, neurologists, endocrinologists, gastroenterologists, rheumatologists, nutritionists, who prepare plans for nutritional regime, as well as optimization of programs for motor activity in families with members who have the formation of METS.