МЕДИЦИНСКИ УНИВЕРСИТЕТ - ВАРНА
„Проф. д-р Параскев Стоянов“
Ул.“Марин Дринов“ 55, Варна 9002, България
Тел. : 052/ 65 00 57, Факс: 052/ 65 00 19
e-mail: uni@mu-varna.bg, www.mu-varna.bg

MEDICAL UNIVERSITY - VARNA
“Prof. Dr. Paraskev Stoyanov”
55, Marin Drinov Str., 9002 Varna, Bulgaria
Tel.: +359 52/ 65 00 57, Fax: + 359 52/ 65 00 19
e-mail: uni@mu-varna.bg, www.mu-varna.bg

Fund “Nauka” Project № 17022 Resume

“Changing in the amount of visceral fat and its relationship to increased cardiovascular risk in patients with long-standing type 1 diabetes mellitus”

Project leader: Prof. Yoto Yotov, MD, PhD

Relevance of the researched problem

Type 1 diabetes mellitus (T1DM) is a metabolic disease with increasing frequency. The main causes of morbidity and mortality in patients with T1DM are cardiovascular diseases (CVD), especially coronary heart disease, stroke and peripheral arterial disease. CVDs are the long-term complication of T1DM of the greatest importance to patients. In addition, obesity in T1DM has increased in recent years. While it has been identified as a risk factor in populations without diabetes, its significance in T1DM has not been studied.

Among the traditional risk factors in individuals with long-term T1DM new ones are constantly being sought. There is many data from observational and interventional studies, which mainly concern type 2 diabetes mellitus (T2DM) while the results in T1DM are insufficient, often non-existent or extrapolated from evidence in T2DM. Such an approach is unsatisfactory for several reasons. First, there is evidence that the pathogenesis of atherosclerosis differs in the two main types of diabetes, as well as from the rest of the population. Second, the age of onset of CVD is different in T1DM and T2DM, as they appear earlier in the life of patients with T1DM. Third, the observed differences in the duration and natural evolution of CVD in patients with T1DM and T2DM suggest the need to start CVD prophylaxis earlier in younger patients with T1DM. The existing models for predicting CVD risk in T1D are not effective enough.

Purpose of the research

To investigate the role of visceral fat mass, nutrition and physical activity on the risk of developing CVD, as well as concomitant metabolic disorders in people with long-term T1DM.

Selection of participants

120 adolescents and adults with T1DM and 60 controls without T1DM and without known CVD, according to gender, age and BMI ± 1 unit of measurement, take part in the project.

Inclusion criteria

Patients with T1DM, with duration of the disease over 15 years (for adolescents – with complete growth); Healthy volunteers of the same sex and age and with a similar BMI; Request to participate, certified by written informed consent.

Exclusion criteria

Participation in clinical trials of drugs or other experimental therapy; Significant mental impairment or other type of interdiction for an independent decision to participate; Significant disability and/ or immobilization; Over 3% change in body weight in the last 3 months; Experienced acute coronary syndrome or other vascular incident; Acute disease/condition during the study (excluding diabetic ketoacidosis and hypoglycaemia) – possible postponement to a later date; Pregnancy in women of reproductive age (in case of delay of a regular menstrual cycle – exclusion by pregnancy test); In participants with diabetes: experienced severe hypoglycaemia or diabetic ketoacidosis in the last 3 months; severe documented microvascular diabetic complications.

Research methods

Questionnaire; Auxology; Clinical examination; Measurement of AGEs; Imaging studies: DXA (Dual-energy X-ray absorptiometry) of the whole body to assess the amount of fat in the body, MRI to assess epicardial adipose tissue, CT for assessment of calcium content in coronary vessels

Laboratory tests: complete blood count, differential blood count, total protein, albumin, calcium, serum iron, phosphorus, ferritin, vitamin B12 active, glucose, serum insulin, creatinine, uric acid, glyphosate, full lipid status , microalbuminuria test , highly sensitive C-reactive protein, insulin, serum RAGE osteoprotegerin, irisin, adiponectin, leptin, free fatty acids, monocyte-chemoattractant protein-1, plasminogen activator inhibitor-1, asymmetric dimethyl -a, IL-6, IL-6-R, SHBG, ST2.

Assessment of physical activity using pedometers, accelerometers; Evaluation of nutrition and food imports; Assessment of CVD risk in patients with T1DM.

Expected benefits

By performing a complex assessment of the risk profile of the participants, continuity will be achieved between the activities of endocrinologists and cardiologists for joint preventive monitoring of patients with T1DM and for determining the most appropriate prophylactic or therapeutic strategy for each individual, starting from childhood. The introduction of new laboratory methods for the assessment of biomarkers of inflammation and metabolic disorders will broaden the horizons of clinicians and researchers about the potential adverse links with the presence of CVD.