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**CARDIOVASCULAR RISK IN PATIENTS WITH TYPE 1 DIABETES**

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According to the International Diabetes Association in 2013 the number of patients with diabetes is 382 million, and by 2035 it is expected to grow to 592 million. Cardiovascular diseases (CVD) are long-term complication of T1DM. While type 2 diabetes mellitus has numerous studies concerning the relationship between CVD and diabetes, the data in type 1 diabetes mellitus have been scarce. The aim of this review is to briefly present recent studies and data on cardiovascular risk.

They outline guidelines for major scientific efforts with the possibility of shaping an effective strategy for the prevention of cardiovascular disease and prevent premature disability and death.

**Keywords:** type 1 diabetes, macrovascular complications, cardiovascular risk, epicardial adipose tissue.

Type 1 diabetes mellitus (ZDT1) is a metabolic disease in which a major pathophysiological mechanism is reduced to possibility of insulin secretion which results in hyperglycaemia.

Microvascular complications have been studied in detail over the last decades since the introduction of the primary biomarker of metabolic disorders in ZDT1 reflecting average blood glucose levels - glycosylated hemoglobin (HbA1c) showed that unsatisfactory metabolic control as measured primarily as moderate levels of blood glucose by HbA1c prevalent factors for morbidity in long ZDT1.

One of the main causes of morbidity and mortality in patients with ZDT1 are cardiovascular disease, especially coronary heart disease, stroke and peripheral artery disease. GCC are long-term complication of ZDT1 most important for patients currently. There are numerous accumulated data from observation of interventional trials in patients with diabetes, which reveal the link between CVD and DM.

Such an approach does not satisfy several reasons. First, there is evidence that the pathogenesis of atherosclerosis as the basis of CVD differs in two major types of diabetes, as well as the pathogenesis in the rest ("non-diabetic") population. Second, the age of manifestation of cardiovascular disease is different in ZDT1 and ZDT2, they appear earlier in the lives of patients with ZDT1. Third, the observed differences in the duration of the natural evolution of CVD in patients with ZDT1 and ZDT2 suggest the need to start prevention of CVD earlier in younger patients generally ZDT1. It is of utmost importance in relation to the vast and growing life expectancy for people with ZDT1 currently.

It is a fact that patients with ZDT1 have often GCC compared to their peers without diabetes.

Difference exists in the risk profile of patients with ZDT1 and ZDT2. While hyperglycemia and bad control of diabetes are important factors for CVD morbidity and mortality in both types of DM, there are certain characteristics in the frequency and extent of expression of other traditional risk factors for developing cardiovascular disease, in particular of CHD. First, the presence of ZDT1 removes the protective role of sex in young women is diabetes. They tend more often to have a CVD and CHD than men with diabetes, but before 40 years of age have the same incidence of cardiovascular disease in men.

Patients with ZDT1 have often hypertension compared to their peers, and the data from the study show that 48% of all people with ZDT1 have elevated blood pressure.

While the average KG, as measured by HbA1c and duration of diabetes are major risk factors for microvascular complications, their value for macrovascular problems is not so clear.

Along with the traditional risk factors for CVD in T1DM constantly looking for new main purpose of prevention. This occurs in conjunction with the increasing knowledge of the role of inflammation and visceral adipose tissue in the pathogenesis of atherosclerosis in general and in particular in ZDT1. The level of systemic inflammation was higher in subjects with ZDT1 than others. Many biomarkers have been studied to clarify this relationship.

C-reactive protein and fibrinogen, representatives of the family of interleukins, other adhesion molecules, TNF-alpha, have been studied in this population and have proven productive value in relation to the GCC.

Endothelial dysfunction is present in almost all patients with ZDT1. This pathological process leading to oxidative stress increases as reactive oxygen types and serum endogenous glycated end products.

The mechanisms by which inflammation works in ZDT1 are probably few and have not yet been clarified, which requires new research and search for new biomarkers associated with the pathogenesis of CVD.

Obesity in young people with ZDT1 is increasing in all continents in recent years and is a new risk factor for future generations with TA. Obesity is a recognized risk factor in the population without DM, but not established what is its significance in ZDT1. The main reason is the lack of individuals with obesity in the recent past due to the relatively poor diabetic control.

Although not as frequent as compared to ZDT1 insulin resistance can occur in patients with ZDT1 especially in recent decades, when the incidence of obesity in ZDT1 increased from 1 to 31% in just 12 years observation. Impaired glucose tolerance is associated with a number of metabolic factors, such as obesity. In addition to the above interesting facts concerning morbidity and mortality from CVD, women with ZDT1 show rising abdominal obesity as a result of emotional disturbances and physical immobilization.

Epicardial adipose tissue accumulates around the heart and the coronary vessels and is a marker of increasing visceral obesity.

Currently, the adipose tissue is considered to be an important endocrine and paracrine organ which produces various active substances. Brown adipose tissue in the epicardium is among the metabolically most active representatives of the adipose tissue.

The relationship with duration of diabetes, exercise capacity of patients nutritional intake of various nutrients and other complications and available, especially with the amount of EMT are very intriguing directions for research. The correlation of all these inter-related factors can complement this knowledge of CVD risk and thus contribute to the prevention of complications in SS T1ZD.

EMT has been evaluated in several studies in ZDT1, but the predictive role in risk is not yet clear. Quantification of the EMT can be done in vivo by various imaging methods. It is a thin layer of visceral fat, which is positioned between the heart and pericardium. It has its own blood supply and origin and is not considered a full equivalent of brown fat. Two-dimensional echocardiography and computed tomography (CT. 6) are often used for this purpose. Magnetic resonance imaging (MRI) with its excellent spatial resolution is now considered the gold standard for imaging of fat tissue and was superior to CT in distinguishing of the epicardium to the pericardial adipose tissue. Another imaging method for determining the risk SS is the measurement of coronary artery calcium score (Qax) by CT examination. Calcium score is based on the spread of calcification in coronary vessels and is measured using a non-opaque CT. The scanning for coronary artery calcium (HOW) is a reliable noninvasive technique for calculating the total load of coronary atherosclerotic plaques and cardiovascular risk. There are various protocols for scanning HOW depending on the voltage, the current of the tube and the thickness of the slices. Carrying out the analysis by CT with dual source of radiation improves the accuracy of measurement. Exposure to radiation is the most frequently cited reason why the recommendations in the updated ACC / AHA for assessing the risk of SS 2013. Qax change from class IIb recommendation (as enshrined in the guidelines of the ACC / AHA 2010) in Class IIb recommendation in asymptomatic subjects with intermediate risk. In recent years, however, there is progress in reducing radiation in assessing Qax through validation of low-dose protocols. The radiation dose in the screening for HOW with low-dose protocol was comparable to or even lower than that in the screening for other diseases such as breast cancer or lung cancer.

This method has some advantages over traditional stress tests, including lower cost, greater sensitivity to prove nonobstructive coronary involvement and excellent predictive value when combined in systems for risk assessment, incl. in individuals with ZD1. KAK actually occurred more often in individuals with ZD1 than in individuals without diabetes.

No data is available, however, to prove the usefulness of the evaluation of Qax predictor of cardiovascular risk in ZDT1. Other methods of testing such as

the evaluation of the thickness of the carotid intima-media, tests with a load, etc., Are less useful for a particular patient T13D and are not recommended in the routine clinical practice except for resting ECG.

Type 1 diabetes mellitus are more and more perceived as a heterogeneous disease. If future studies confirm this, it is logical to assume that the risk of macrovascular disease and CVD will also differ between patients. Load GCC at ZDT1 difficult to estimate because of the lack of widely using specific algorithms (systems) for predicting the risk CC.

Proposed several specific T1ZD systems for calculating risk, such as the model cohort EDIC, the instrument of ADA for risk assessment and risk predictor of the study "Atherosclerotic Risk in Community (ARIC)", but most of them have not been tested in more heterogeneous populations.

In summary, type 1 diabetes is a disease with increasing duration of active life and presumably at high cardiovascular risk who has not been adequately studied. Not studied the dependence of the CC risk of metabolic status and mostly visceral fat, as well as the level of physical activity. New data from patients groups with different levels of diabetic control and limitation of different races and different cluster of additional risk factors would contribute to a more complete risk assessment, and hence for early and effective prevention of possible adverse cardiovascular event.

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## VASCULAR SURGICAL ASPECT OF DIABETIC FOOT

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### SUMMARY

Diabetes continues to grow globally and to spend extremely large resources in the health sector. One of the main factors for the incidence of diabetes is diabetic foot. Necrotic changes in the latter are a complex problem. Ischemia, neuropathy and infection are the three pathological components that lead to complications and often occur together as etiological triad. Neuropathy and ischemia are initiating factors, most often in tandem as neuroischemia until the infection is more a consequence. The role of peripheral arterial disease in diabetic foot long underestimated since typical ischemic symptoms are less common in diabetic patients with ischemia than in non-diabetic patients. Each necrosis diabetic foot must wake suspected vascular disease until proven otherwise. Early referring the patient to a specialist, noninvasive vascular testing, diagnosis and intervention are crucial for the healing of necrosis and for the prevention of amputations, timing is crucial because a window in which we can achieve wound healing and save limbs often can be omitted.

**Keywords:** diabetic foot, neuroischemia, revascularization, amputation.

Diabetes mellitus and complication are becoming a major cause of morbidity and mortality worldwide. This is a global problem that burdens significant health systems and increased dramatically over the past two decades. For the first time Zmmet in 1992 used the term "diabetes epidemic", whereas as economic burden of disease on society and purely human suffering from it. According to various epidemiological studies cases of diabetes were about 30 million in 1985, 177 million in 2000, 285 million in 2010, their number is expected to grow to 360 million in 2030 to a mind-boggling 642 million in 2040. Tap necrosis occurred in 25% of patients, so it should be given more attention on prevention rather than treatment of ulcers, because five-year mortality rates in diabetic patients who have suffered an amputation of lower limbs, are extremely high, making them more than just lung cancer.

The World Health Organization suggests that in 2030, diabetes will be the seventh in a row cause of death globally. He one of the leading causes of loss of limb and each year more than 1 million people undergo amputation. Approximately 80% of these amputations are preceded by foot necrosis. Risk factors for ulcers include neuropathy, peripheral arterial disease, foot deformity, restricted movements in ankle high plantar pressure of the foot, small injuries, ulcers or previous amputations. At least a quarter of these ulcers will heal and to 28% of them may need some form of amputation.

### Diabetic peripheral neuropathy

In diabetic foot neuropathy is the main risk factor for the development of ulcers. According to various sources, the spread between 16 and 66 percent, increasing the duration of diabetes and poor glycemic control.