

## 1. BIOCHEMICAL ASPECTS OF HEART DISEASES IN PATIENTS WITH DIABETES MELLITUS.



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**Introduction.** The prevalence of diabetes mellitus is continuously increasing globally and is estimated to reach approx. 366 million by 2030. According to the latest research, the cardiovascular changes due to diabetes are based on metabolic, hormonal and genetic imbalances.

**Aim of study.** Elucidation of biochemical aspects of cardiovascular diseases induced by diabetes, in order to improve diagnosis and to develop effective treatment methods.

**Methods and materials.** To achieve the proposed goal, a bibliographic search was performed using 5 bibliographic sources, between the 2020-2023, including those of the Medical Scientific Library of USMF "*Nicolae Testemitanu*", data of the electronic libraries such as PubMed, Cambridge Journals Online, Elsevier, Medline, MedScape, Diabetes Care and Diabetologia.

**Results.** Diabetes Mellitus forms a hyperglycemic condition in patients, which leads to the increased secretion of interleukin 6 (IL-6), interleukin-1 $\beta$  (IL-1 $\beta$ ). This can induce cardiovascular problems like atherosclerosis and heart failure. The interleukin 6 (IL-6) has the role in the atherothrombosis formation in the coronary heart disease, heart failure. Interleukin 1 $\beta$  (IL-1 $\beta$ ) decreases the beta-adrenergic responsiveness of calcium channels and increases the activity of nitric oxide synthase (NOS), resulting in decreased myocardial contractility, increased myocardial hypertrophy and induces cardiomyocyte apoptosis. Interleukin-1beta (IL-1 $\beta$ ) can be detected in the endothelium and macrophages of the coronary arteries affected with atherosclerosis and coronary arteries from nonischemic cardiomyopathy hearts. Recently has been discovered a member of the interleukin family - interleukin 34 (IL-34). Its levels are high in coronary heart disease and diabetes. Interleukin 34 (IL-34) has pro-inflammatory actions, causing atherosclerosis and insulin resistance. Interleukin 6 (IL-6) and interleukin 1 $\beta$  (IL-1 $\beta$ ) stimulate the production of C- reactive protein. Sodium-glucose co-transporter-2 (SGLT2) inhibitors lower the interleukin levels which would lower the risk of cardiovascular outcomes and diabetes.

**Conclusion.** Type 2 diabetes patients are at high risk of cardiovascular diseases like atherosclerosis, myocardial infarction, heart failure due to the increased secretion of inflammatory cytokines like interleukin 6 (IL-6), interleukin 1 $\beta$  (IL-1 $\beta$ ). Scientific studies propose the implementation of regimes with SGLT2 inhibitors: canagliflozin, empagliflozin which are beneficial against the cardiovascular consequences of diabetes in humans.