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PREVENTIVE AND DIAGNOSTIC SIGNIFICANCE OF ECG RESULTS IN PATIENTS WITH DIABETES MELLITUS

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Abstract
The scientific article presents the changes in cardiac automatism, conduction and contractility functions and ECG signs in diabetes mellitus. The scientific article is relevant because it highlights the effects of hypoglycemic and hyperglycemic states on the cardiovascular system in patients with diabetes and the types of rhythm disturbances detected in the ECG examination in these cases and their causes.

Introduction

Relevance of the Work

In recent years, diabetes mellitus is one of the most common diseases in Uzbekistan. Especially during the 2019 Covid-19 pandemic, the incidence of diabetes mellitus increased sharply as a result of direct damage to the blood coagulation system and the vascular system, including the pancreas.

Among them, the level of mortality and disability from complications of diabetes, especially complications of diabetes on the cardiovascular system, has increased.

Research Objective

In Uzbekistan, in order to prevent mortality and disability from complications of the cardiovascular system in patients with diabetes, the state standard includes an ECG examination of patients once a year.

Materials and Methods

As a result of these examinations, early detection of changes in the cardiovascular system in patients with diabetes and prevention of complications have increased.

It is known that complications of diabetes include nephropathy, angiopathy, polyneuropathy, enteropathy and diabetic cardiomyopathy. Complications caused by diabetes mellitus from the cardiovascular system include various heart rhythm disturbances, atherosclerotic vascular damage, myocardial infarction, and chronic heart failure. In patients with diabetes, the development of atherosclerosis is observed 8-10 years earlier than in people without diabetes, and is more severe.

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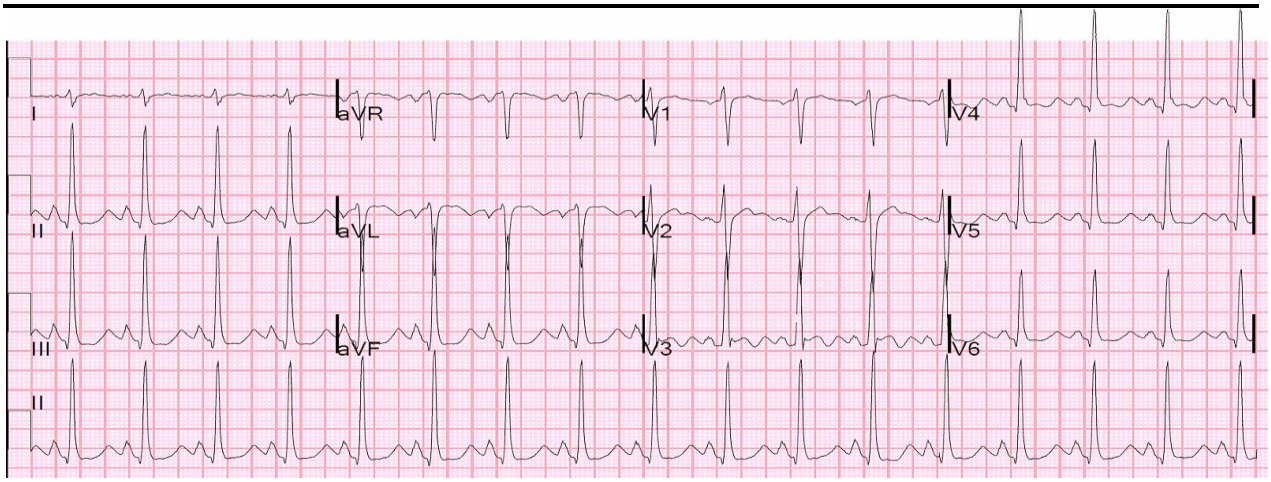
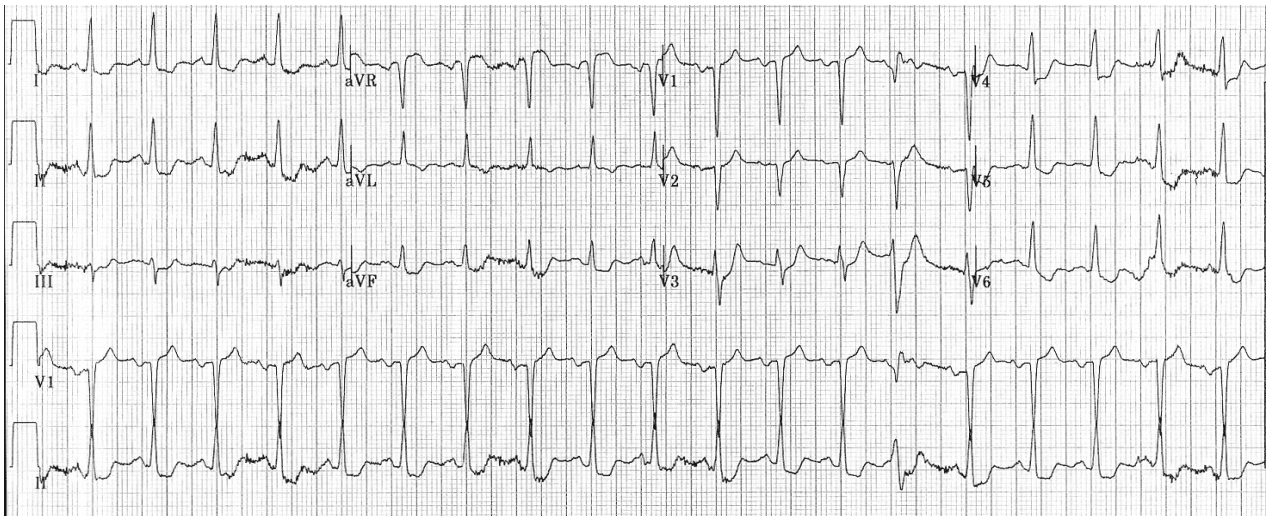
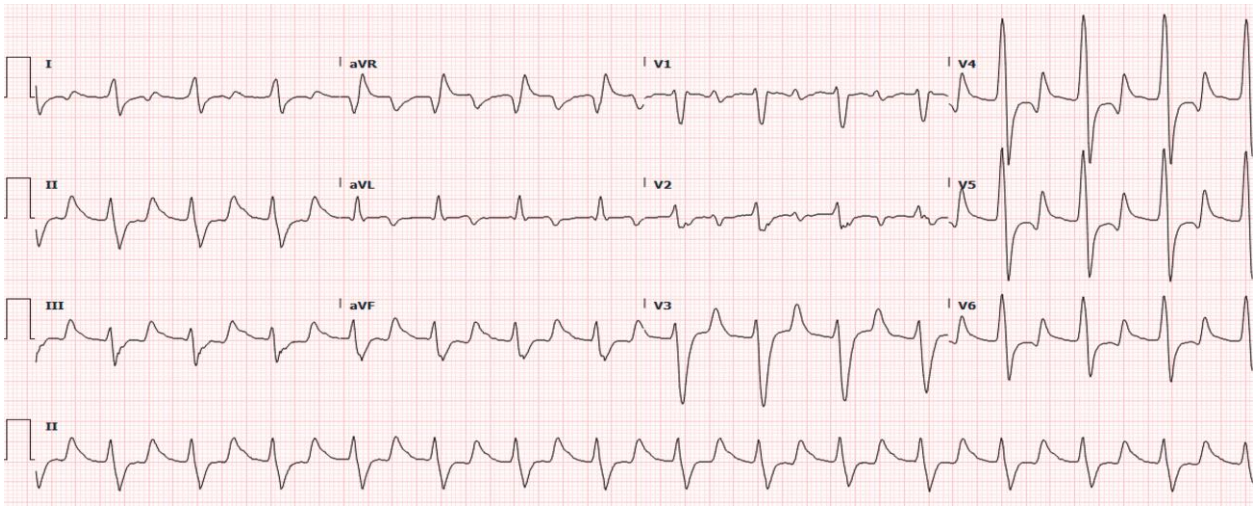


1- picture The ECG shows sinus tachycardia, which is observed in a state of hyperglycemia in diabetes mellitus.



Picture-2. Sinus tachycardia associated with hyperglycemia in diabetes mellitus, ST segment depression and single ventricular extrasystole on the ECG.



Picture-3. Supraventricular paroxysmal tachycardia, depression of the ST segment due to rhythm disturbances, observed in diabetes mellitus on the ECG

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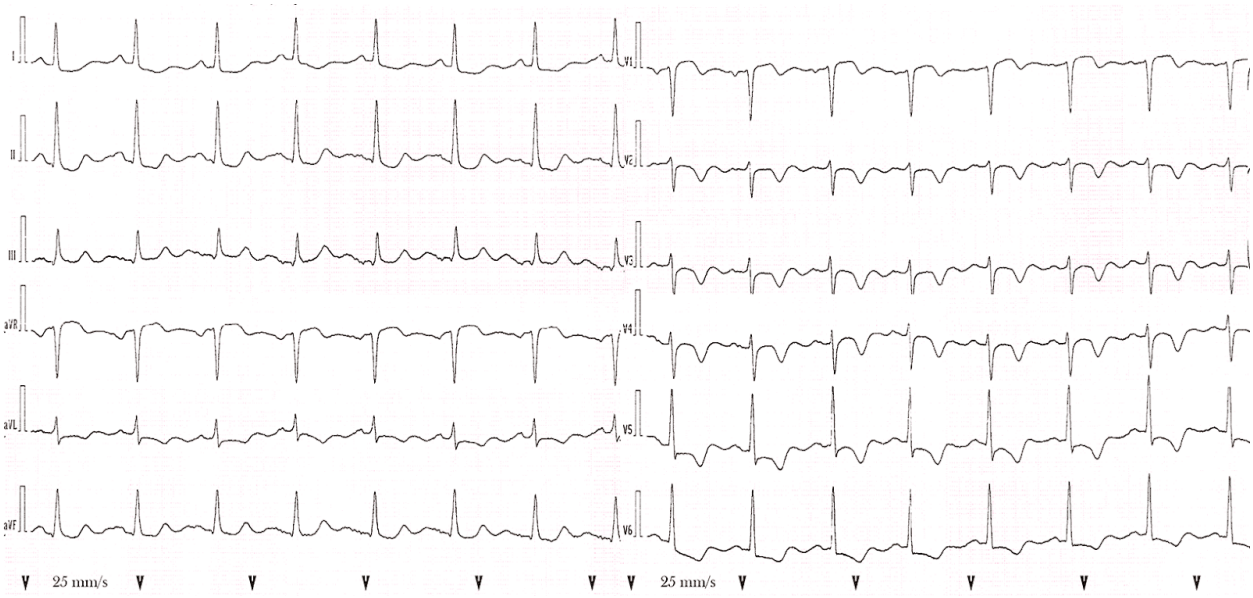

Picture-4. Myocardial infarction of the anterior wall of the left ventricle with T wave inversion and ST segment depression is observed in diabetes mellitus on the ECG.

According to the results of an ECG study, ST segment depression on the ECG occurs 2-4 times more often in patients with diabetes mellitus than in patients without diabetes; changes in ST segment elevation, including in acute myocardial infarction and unstable angina, are observed 4-7 times more often .

In diabetes mellitus complicated by diabetic cardiomyopathy, the ECG reveals signs of diffuse dystrophic disorders in the myocardium, ST segment inversion, ST segment depression and signs of left ventricular hypertrophy: displacement of the electrical axis of the heart to the left, increased amplitude of the R wave in leads aVL, I, V5-V6 , in leads V1-V2 there is a deepening of the S wave.

Results and Discussion

Instead, we present the following facts about changes in the cardiovascular system of patients with diabetes:

Hyperglycemia and cardiovascular diseases are related to each other. According to the results of DECODE tests, when blood sugar levels rise above 8 mmol/l, cardiovascular pathology increases by 2 times.

Hyperglycemia above 15 mmol/l affects the cardiovascular system as follows:

-dysregulation of heart rate, in particular activation of the sympathetic autonomic nervous system and, as a consequence, an increase in the number of heart contractions (tachycardia)

-increased risk of developing various ventricular arrhythmias

- causes a decrease in the response of the cardiovascular system to an orthostatic test.

- Decrease in glycemia from 4 mmol/l:

- Increased heart rate

- to ventricular arrhythmias

- leads to depression of the ST segment on the ECG

A high level of glycemia (CV>36%), duration of the hypoglycemic period (TIR-HYPO), high hyperglycemic period (TIR-HYPER) serve as a proarrhythmic factor and cause ventricular arrhythmias.

The highest mortality rate was observed in people with glucose values above 11.1 mmol/L 2 hours after eating.

Also, reducing this indicator by 2 mmol/l reduces mortality from diabetes by 20-30%.

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