Comparative Evaluation of the Prognotic Significance of Myocardial Infarction in Patients with Hypertension Depending on the Time of Pathological Q Wave Formation on ECG

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Annotation: This article analyzes the ECG signs of myocardial infarction with and without Q waves in patients with hypertension and their changes. The hourly variation of the ECG differences of myocardial infarction with Q waves and descriptions for each case are described. Cardiovascular diseases and their mortality rate are ranked 1st in the world. Among them, hypertension is the leading cause of death. Myocardial infarction is the leading cause of death.

Keywords: myocardial infarction, hypertension, Q wave, ECG, mortality, comorbidity, gender, risk factor, age, lifestyle.

Myocardial infarction (also called heart attack) is an acute episode of ischemia of the heart muscle, characterized by the cessation of blood flow to the heart when the blood supply is disrupted. If blood does not resume within fifteen minutes, part of the heart dies (myocardial necrosis). This part of the heart with dead tissue is called a myocardial infarction. Necrosis can be extensive or small-focal. According to the location of the necrosis: anterior myocardial infarction, lateral myocardial infarction, and interventricular infarction.

Myocardial infarction occurs five times more often in men under the age of 60 than in women of the same age. This is due to the early development of atherosclerosis in men.

Depending on the size of the necrosis in the myocardium, myocardial infarction is divided into large-focal or small-focal myocardial infarction. Large-focal myocardial infarction: transmural - necrosis that crosses the myocardium; intramural - large-focal necrosis can be observed in the inter-myocardium. Small-focal myocardial infarction includes: subepicardial (necrosis occurs where the myocardium touches the epicardium), subendocardial (necrosis occurs where the myocardium touches the endocardium); myocardial infarction.

Depending on the location of necrosis in the myocardium, infarction is called as follows. Infarction of the anterior wall of the heart, the lower posterior diaphragmatic end, the posterior wall, the lateral wall and the posterior - obturator wall. Myocardial infarction most often occurs in the left ventricular wall of the heart. Infarction in the right ventricular wall of the heart is very rare. Myocardial infarction is observed first in the anterior wall of the left ventricle, then in the posterior wall. When examining the hearts of people who died from myocardial infarction, it is determined that they had coronary artery atherosclerosis. Changes are seen in three circles (zones) in the myocardium of the heart.

Acute period. Myocardial infarction begins with severe pain, mainly in the heart area. Among the scientists who studied this symptom, A. L. Sirkin (1991) showed that myocardial infarction begins with pain in 94% of patients, and F. I. Komarov and others showed that in 86-95% of patients, the pain is severe. The patient often cannot stand it. Sometimes there are patients who endure the pain and take medication on their own. The pain is described in different ways. Some say that "a red-hot iron is pressing on my chest," while others say that "horse hooves are standing in my chest." The pain is long - lasts from several hours to one or two days.

The average acute period of myocardial infarction lasts from one week to 30 days. The patient's condition begins to improve, the patient feels that the dangerous days have passed, his activity in bed

increases. Post-infarction angina attacks may occur. Blood pressure is normal. The period after myocardial infarction. The patient's condition improves, he walks actively, occasionally feels pain around the heart, blood pressure and pulse are normal. Heartbeats are even, sometimes extrasystoles are observed. In general, during this period, the chronic form of ischemic heart disease varies. Complications rarely develop. A scar gradually forms in the place of the necrosis focus in the myocardium of the heart. The clinical picture is stable, and signs of aseptic inflammation disappear. This period lasts from 1 to 3 months.

Objective: To assess the early and late prognosis of comorbid myocardial infarction (MI) in patients with hypertension, depending on the presence or absence of pathological Q waves on the ECG, as well as the time of Q wave appearance. The difference in the frequency of infarction with and without Q waves. To assess the incidence and complications of MI in relation to age and gender.

Materials and methods: The study included 58 patients (43 men, 15 women) aged 40 to 72 years (mean age 62.1 ± 11.9 years) who were referred to the Bukhara Regional Cardiology Dispensary. Patients were examined based on the following criteria:

In cases of MI with ST segment elevation within 24 hours of the onset of the first angina attack in the anamnesis. All patients underwent the following standard clinical examination: general and biochemical blood tests, troponin T and I levels, ECG, ExoKG. For thrombolytic therapy (TLT), patients were given the drug Streptokinase according to the instructions. All patients were divided into 3 groups depending on the dynamics of ECG signs. Group 1 included 14 patients with no Q wave on the ECG, group 2 included 19 patients with late Q wave appearance (6-24 hours after the onset of the attack), and group 3 included 25 patients with early pathological Q wave appearance on the ECG (up to 6 hours after the onset of the attack).

Results: Patients with early Q waves on the ECG initially had a more severe MI. Based on the standard treatment criteria, narcotic analgesics, streptokinase, anticoagulants, nitrates, β-blockers, etc. were used. A significant difference ($p<0.01$) was found between patients who underwent TLT. In the least cases, TLT therapy was prescribed to patients without Q waves. After TLT, a significant decrease in in-hospital mortality was observed ($P>0.5$). Also, the rate of development of acute heart failure in patients who underwent TLT developed at significantly lower rates than in patients who did not undergo TLT ($p<0.01$).

The in-hospital mortality rate of patients without Q waves on ECG was 1.2% ($p>0.05$), the mortality rate of patients with late Q waves was 3.1% ($p<0.001$), and the mortality rate of patients with early Q waves was 5.1% ($p<0.05$). The most common causes of in-hospital mortality were cardiogenic shock (group 1 – 0.5%, group 2 – 1.7%, group 3 – 5.2%) and acute left ventricular failure (group 1 – 0.7%, group 2 – 2%, group 3 – 4.8%). The early and late prognosis of MI was also analyzed depending on the age of the patients. Among patients under 50 years of age, in-hospital mortality rates did not differ significantly among patients, as in-hospital mortality was relatively low in all groups.

When analyzing the overall 2-year mortality rate in patients with no Q waves on ECG under the age of 50, it was significantly lower than in patients with late Q waves on ECG and in patients with early Q waves. In patients aged 50 and older, both in-hospital and overall 2-year mortality rates were significantly higher in the group of patients with early Q waves than in the group of patients with late Q waves and those without Q waves. However, there was no significant difference in the incidence of mortality between the groups of patients with late Q waves and those without Q waves.

Conclusion: Thus, the early appearance of pathological Q waves on the ECG (within 6 hours of MI) was analyzed as a poor prognostic factor in the early (hospital) and late stages of MI. The late appearance of pathological Q waves on the ECG, as well as cases without Q waves, were analyzed as good prognostic factors for them. ECG analyses also differed in terms of age and gender, and we observed that hypertension and the development of myocardial infarction against its background were more common in men under 55 years of age, while in women after 55 years of age. We also observed that the development of complications was more common in men than in women.

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