

### Assessment of the Effects of Ramipril and Pirindopril on Left Ventricle Systolic Function in Patients with Acute Myocardial Infarction without ST Segment Elevation

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#### Article Information

**Received:** March 09, 2023

**Accepted:** April 10, 2023

**Published:** May 11, 2023

**Keywords:** *IHD, AMI, ramipril, pyrindopril, left ventricle, etc*

#### ABSTRACT

This article analyzes the effect of ramipril and pyrindopril on the systolic function of the left ventricle in patients with acute myocardial infarction without ST segment elevation hospitalized in the ACS department of the Samarkand Regional Branch of the Republican Scientific and Practical Specialized Medical Center for Cardiology. The mean age of the patients was  $55.7 \pm 3.4$  years. All patients received standard AMI treatment ( statin, ASA, clopidogrel, beta- blocker, ACE inhibitor ) and were divided into 2 comparable groups depending on the therapy: in the 1st group (n=31), ramipril was used as an ACE in the initial dose of 5 mg 1 time per day, in the 2nd group (n=35) - pyrindopril at an initial dose of 2 mg 1 time per day with dose titration to the maximum tolerated. In a comparative assessment of the effectiveness of ACE inhibitors in patients in the early period of AMI, a more significant clinical efficacy and effect on postinfarction LV remodeling, a more significant effect on indicators of endothelial dysfunction and systemic inflammation with the use of ramipril were noted, which allows us to recommend it as the drug of choice in the treatment of patients with AMI, including to preserve the systolic function of the left ventricle.

#### Introduction:

In recent years, chronic non-communicable diseases, primarily cardiovascular diseases, have become the most common cause of death in the world. Among the latter, coronary heart disease (CHD) prevails [2, 4, 6]. According to the 2030 forecast, mortality from coronary artery disease in countries with low per capita income will exceed the cumulative mortality from infectious diseases. In economically developed countries, coronary artery disease also remains the main cause of disability and mortality in the group of people over 35 years of age. The extreme manifestation of IHD is myocardial infarction [7, 9, 11]. The functional state of the myocardium of the left ventricle (LV) in IHD is assessed by many parameters. Currently, much attention is paid to the violation of local LV myocardial contractility [1, 3, 5]. It is known that exposure to cold leads to significant changes in the cardiovascular system and systems of its regulation. However, the question remains open in the literature about the effect of the necrosis zone on intracardiac hemodynamics and LV myocardial LV in patients with acute myocardial infarction (AMI) [8, 10, 12].

In patients with acute myocardial infarction (AMI), the death of part of the functioning myocardium of the left ventricle (LV) initiates compensatory changes in the heart, affecting its size, geometry, and function. The complex of these changes is united by the concept of postinfarction remodeling [13, 15, 17]. In some patients, the outcome of remodeling is a long-term stabilization of the size and function of the left ventricle, which is accompanied by a rather favorable cardiac prognosis. At the same time, in other patients, it passes into a disadaptation phase, which is accompanied by a hemodynamically unfavorable, excessively pronounced and / or progressive increase in the LV and a decrease in its contractility [14, 16, 18]. Numerous studies conducted in recent years have demonstrated an association between an increase in LV end-diastolic volume (index), its end-systolic volume (index) and a decrease in ejection fraction associated with adverse post-infarction remodeling, with an increase in the risk of cardiac death, recurrent AMI, development of congestive heart failure, as well as embolic stroke [19, 21, 23].

Therefore, the ability to predict the unfavorable nature of postinfarction LV remodeling is equivalent to the ability to identify patients in the early period of infarction with a high risk of cardiovascular complications and cardiac death in the long term. Such prediction, in turn, can play a significant role in assessing the feasibility of performing endovascular / surgical revascularization in the territory of the infarct-related artery in patients who underwent thrombolysis [9, 20, 22], as well as a more differentiated approach to prescribing medications in the postinfarction period, capable of preventing remodeling [10–12, 24]. Recent studies have studied the relationship of some indicators of the acute period of infarction with the likelihood of adverse postinfarction remodeling [13–15]. Nevertheless, there are no generally accepted algorithms for identifying patients who are threatened by it [16, 18]. In connection with the above, the development of criteria for predicting an unfavorable course of postinfarction left ventricular remodeling based on the analysis of indicators available to the clinician in the acute period of myocardial infarction is of considerable interest.

**Objective:** to evaluate the effect of ramipril and pyrindopril on postinfarction left ventricular (LV) myocardial remodeling, endothelial function, and systemic inflammation in patients with AMI without ST segment elevation.

**Materials and Methods:** The study included 66 patients with AMI without ST segment elevation hospitalized in the ACS department of the Samarkand Regional Branch of the Republican Scientific and Practical Specialized Medical Center for Cardiology. The mean age of the patients was  $55.7 \pm 3.4$  years. All patients received standard AMI treatment ( statin, ASA, clopidogrel, beta-blocker, ACE inhibitor ) and were divided into 2 comparable groups depending on the therapy: in the 1st group (n=31), ramipril was used as an ACE in the initial dose of 5 mg 1 time per day, in the 2nd group (n=35) - pyrindopril at an initial dose of 2 mg 1 time per day with dose titration to the maximum tolerated. The target dose for ramipril was 10 mg per day, for pyrindopril - 2 mg per day. The target dose of ACE inhibitors in the 1st group was reached by 44.7% of patients, in the 2nd - 55.3%. The study did not include patients with AMI more than 48 hours ago, LV EF less than 45%, diabetes mellitus, diseases and conditions that significantly worsened the prognosis. All patients on the 1st, 2nd and 30th days from the onset of AMI, along with the mandatory examination methods, underwent ECG, echocardiography, determination of the level of CRP and NO in the blood.

**Results:** by the end of the 1st month of observation, no deaths were registered in both study groups. Early postinfarction angina pectoris was noted in 1 patient of the 1st group (7.7%) and in 3 patients of the 2nd group (21%). After 1 month of therapy, patients of the 1st group who received ramipril had significantly better dynamics of the structural and functional parameters of the heart. According to echocardiography, both in the 1st and 2nd groups, an improvement in LV systolic function was observed, more in the ramipril group. LV EF increased by 6.7% in group 1,

by 3.3% in group 2. In the ramipril group, a significantly lower number (by 9.7%) and duration (by 11.4%) of episodes of myocardial ischemia according to ECG were recorded. Initially, both in the 1st and 2nd study groups, an increased concentration of CRP and NO levels in the blood was determined. After 30 days in both groups, there was a significant decrease in these indicators to a greater extent in the ramipril group : CRP by 83.2%, NO by 35.3% in the ramipril group, by 76.7% and 21.8% in the pyrindopril group, respectively.

**Conclusions:** Thus, in a comparative assessment of the effectiveness of ACE inhibitors in patients in the early period of AMI, a more significant clinical efficacy and effect on postinfarction LV remodeling, a more significant effect on indicators of endothelial dysfunction and systemic inflammation when using ramipril were noted, which allows us to recommend it as the drug of choice in the treatment of patients with AMI, including to preserve LV systolic function.

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