



Beta Blockers in the Treatment of Acute Coronary Syndrome

Esad Alibasic¹, Farid Ljuca², Olivera Batic-Mujanovic³, Enisa Ramic³, Amila Bajraktarevic³,
Emir (E) Alibasic⁴

¹Department of Family Medicine, Primary Health Care Center Kalesija, Kalesija, Bosnia and Herzegovina

²Department of Physiology, Faculty of Medicine, University of Tuzla, Tuzla, Bosnia and Herzegovina

³Department of Family Medicine, Primary Health Care Center and Polyclinics Dr Mustafa Sehočić Tuzla, Tuzla, Bosnia and Herzegovina

⁴Medical Faculty, University of Tuzla, Bosnia and Herzegovina

Corresponding author: Esad Alibasic, MD. Department of Family Medicine, Primary Health Care Center Kalesija, Kalesija, Bosnia and Herzegovina.

ABSTRACT

Objective: analysis and monitoring of the effectiveness of beta-blockers (BB) in the treatment and prognosis of acute coronary syndrome (ACS).

Background: Heart and blood vessels disease are the most common chronic disease and the leading cause of death in the world. The largest proportion of deaths from cardiovascular disease is coronary ischemic disease, which represents a broad spectrum of clinical manifestations starting from acute coronary syndrome until stable coronary heart disease, various forms of angina pectoris, chronic myocardial infarction, valvular disease, and eventually heart failure. ACS is a manifestation of atherosclerosis which is usually preceded by acute thrombosis caused by ruptured or eroded atherosclerotic plaque, with or without accompanying vasoconstriction, causing a sudden and critical reduction in blood flow. Patients with ACS, especially older ones, are at high risk of death. Beta-blockers (BB) are drugs that are recommended for early use of ACS in acute myocardial infarction (AMI), and for long-term use in the secondary prevention after AMI, unless there is a contraindication. Early therapy BB is recommended as part of a doubt for the emergency treatment of AMI, especially if the patient with tachycardia or hypertensive. Also, analysis and monitoring of patients in acute myocardial infarction who were subjected to emergency primary coronary intervention (PCI) pointed to the significant reduction in mortality if BB administered to patients before the intervention. Sustained use BB recommended in patients with reduced LVEF after AMI, and in patients with chronic heart failure NYHA II-IV. Early use of BB in the treatment of ACS in our case, together with antiplatelet medication-administration in the prehospital setting, improve the prognosis of stabilization of tachycardia, hypertension, chest pain and reducing the possible "abort" of ECG diagnosed myocardial infarction, and their application in permanent treatment, has shown a significant efficacy in reducing the complications of ACS.

Conclusion: The use of BB, unless contraindicated, should begin in the early stages in most patients with ACS, intravenously or orally. The use of BB is particularly justified in tachyarrhythmias and high blood pressure in the ACS, and as adjunctive therapy for the relief of angina attacks. Secondary prevention using hygienic dietary regimen and medical therapy BB, with maximum control of all risk factors improves prognosis and reduces the complications of ACS.

Key words: BB, ACS, ST segment Elevation Myocardial Infarction (STEMI), AMI, New York Heart Association (NYHA).

INTRODUCTION:

Heart and blood vessels disease are the most common chronic disease and the leading cause of death in the world.(1) The largest proportion of deaths from cardiovascular disease is coronary ischemic disease, which represents a broad spectrum of clinical manifestations starting from

acute coronary syndrome until stable coronary heart disease, various forms of angina pectoris, chronic myocardial infarction, valvular disease, and eventually heart failure. ACS is a manifestation of atherosclerosis which is usually preceded by acute thrombosis caused by ruptured or eroded atherosclerotic plaque, with or without accompanying vasoconstriction, causing a sudden



and critical reduction in blood flow. In STEMI fibrin clot is rich and usually totally occlusive, while in NSTEMI mainly platelet and partially or intermittently occlusive. How clot grows, parts of thrombus are separated from the stem and may cause embolisation of coronary microcirculation. Patients with AMI, especially older ones, are at high risk of death. BB are drugs that are recommended for use in the early AMI, and for long-term use in the secondary prevention after AMI (2), except in the case of contraindications. Early therapy BB is recommended as part of the emergency treatment of AMI, especially if the patient is with tachycardia or is hypertensive. Due to the adverse effects of BBs, including bradycardia, hypotension, bronchospasm, there is no clear cardiologists consensus in terms of the appropriate duration of treatment with BB in the AMI patients with normal left ventricular function or requiring BB for hypertension or arrhythmia. Therefore, the use of BB indefinitely recommended in patients with reduced LVEF after AMI (3), and in patients with chronic heart failure NYHA II-IV (4). The reasons for non-use of BB could only be "classical" contraindication (PQ interval over 0.24, AVblock-II-III degree without pacemaker, cardiac frequency is less than 50 min, systolic blood pressure less than 90 mm Hg, chronic heart failure, asthma and chronic obstructive pulmonary disease).

OBJECTIVE: Analysis and monitoring of the effectiveness of BB in the treatment and prognosis of ACS.

CASE REPORT: 54 year old man comes in family medicine with a strong retrosternal pain and a feeling of lack of air. He has a long-standing hypertension, has been smoking for 39 years, overweight. In family history, mother died in the 58-year of ICV. He has been regularly taking the recommended antihypertensive therapy Lisinopril 10 mg 1x1 for seven years as well as ASS tablets

100 mg 1x1. At medical examination: RR 160/100 mm Hg, heart action tachycardiac, rhythmic, pulse 110 / min. ECG: ST elevation in the inferior leads. Given the elapsed time of 30 minutes from the onset of symptoms to first medical contact and setting up ECG diagnosis of STEMI, in the context of planning more optimally needed reperfusion and shortening the total ischemic time, and estimates that it can comply with the estimated time and conditions (120 minutes) to sale catheterization right in the prehospital setting, administered the necessary antiplatelet therapy with BB, statins and antianginal drugs, and emergency transport with ECG monitoring and monitoring of all vital parameters, and urgent admission to the Internal clinic Center Tuzla, while advising of duty teams for sale catheterization Clinic for cardiovascular Surgery. Ordered therapy in the family medicine: Clopidogrel tablets 600 mg orally, ASS tablets 300 mg orally, Atenolol tablets 50 mg orally, Atorvastatin tablets 10 mg orally, Nitrolingval sublingual spray, morphine 2.5 mg i.v. On ECG admission at Internal Clinic: ST elevation in the inferior leads, in which therapy Heparin 6000 IU iv. is administered and placed in the catheterization laboratory. The urgent coronary angiography will be done, which doesn't show significant coronary occlusion. In that case we will give up with revascularization and approaches to the management directed by medical therapy. After a three-day hospitalization at the Department of Cardiovascular Surgery Center Tuzla, with monitoring and additional diagnostics, the patient is released with a recommendation to continue with the hygienic dietary regimen with maximum control of all risk factors, Trandolapril tablets 2 mg 1X1, bisoprolol tablets 2.5 mg 1x1, Clopidogrel tablets 75 mg 1x1, aspirin tablets 100 mg 1x1, rosuvastatin tablets 20 mg 1x1. At check-ups by a cardiologist after a



month, then, after three and six months with the same treatment, the patient has no symptoms and he has stable condition, the continuation of the same treatment is recommended for next six months, when the new checkup is scheduled.

DISCUSSION: Numerous studies have shown that an early adoption of BB, already in the first hours of ischemia if there are no contraindications, improves survival and realizes mortality reduction (prevention and reduction of malignant heart rhythm disorders, reducing infarct zone).(5) Data from the Norwegian multi-center study has shown that BB increase survival and prevention of reinfarction in patients with non-Q myocardial infarction (MI) (6). American therapeutic guide for MI recommended BB as drugs and classes in patients in the acute phase of non-Q MI, and as a medication class IIa, in patients after myocardial non-Q MI.(7) Several large randomized clinical studies, involving thousands of patients with a history of heart attack, showed a significant reduction of morbidity and mortality (up to 25%), if BB is involved in therapy after hospital discharge in ongoing therapy, regardless of the presence of other comorbidities (diabetes mellitus, degree of heart failure, chronic lung disease, heart rhythm disorder). Optimum elapsed time from onset of symptoms until first medical contact and setting up ECG diagnosis of STEMI, in the context of planning more optimally needed reperfusion, and the early administration of BB, antiplatelet, statin therapy, and other prescribed therapy in the prehospital setting, (8) as well as the transportation and emergency reception at the Internal clinic Center Tuzla, while advising of duty team catheterization, our patient was shortened total ischemic time and improve the prognosis and treatment of ACS. Analysis and monitoring of patients in AMI who were subjected to emergent primary coronary intervention (PCI), (9) pointed to the significant reduction in

mortality if BB administered to patients before the intervention. Early use of BB in the treatment of ACS in our case, as well as their use in secondary prevention, showed their significant efficacy and safety.

CONCLUSION: The use of BB, unless contraindicated, should begin in the early stages in most patients with ACS, intravenously or orally. The use of BB is particularly justified in tachyarrhythmias and high blood pressure in the ACS, and as adjunctive therapy for the relief of angina attacks. Secondary prevention using hygienic dietary regimen and medical therapy BB, with maximum control of all risk factors, improves prognosis and reduces the complications of ACS.

Conflict of interest: none declared.

REFERENCES

1. Roth GA, Forouzanfar MH, Moran AE i sur. Demographic and epidemiologic drivers of global cardiovascular mortality. *N Engl J Med* 2015;372(14):1333-41.
2. Lopez-Sendon J, Swedberg K, McMurray , et al. Expert consensus document on beta-adrenergic receptor blockers. *Eur Heart J*. 2004;25(15):1341-62
3. Dargie HJ. Effect of carvedilol on outcome after myocardial infarction in patients with left-ventricular dysfunction: the CAPRICORN randomised trial. *Lancet*. 2001;357(9266):1385-90.
4. Packer M, Coats AJ, Fowler MB, et al. Effect of carvedilol on survival in severe chronic heart failure. *N Engl J Med*. 2001;344(22):1651-8.
5. Kjekshus JK. According to MIAMI and ISIS-I trials, can a general recommendation be given for beta blockers in acute myocardial infarction? *Cardiovasc Drugs Ther*. 1988;2(1):113-9.



6. Mason JW. A comparison of seven antiarrhythmic drugs in patient with ventricular tachyarrhythmias. *N Engl J Med* 1993;329: 452-9.
7. ACC/AHA/ACP-ASIM guidelines for the evaluation and management of chronic heart failure committee on management of patients with chronic heart failure: 2001. Available from: <http://www.acc.org/American Heart Association-www.americanheart.org>
8. Guideline for the Diagnosis and Management of Patients With Stable Ischemic Heart Disease. *Circulation*. 2012 Dec 18;126(25):e354-471)
9. B R Brodie , T D Stuckey. Mechanical reperfusion therapy for acute myocardial infarction: Stent PAMI, ADMIRAL, CADILLAC and beyond. *Heart*. 2002; 87(3): 191–192.)