

Comparative Effectiveness of Conservative and Invasive Treatment of Myocardial Infarction in Elderly and Old Patients

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Old age is one of the most important factors influencing the outcome of myocardial infarction (MI). According to several studies, over 50% of MI-related deaths occur in patients over 75 years old. The authors performed a comparative analysis of the effectiveness of conservative and invasive treatment in 656 patients with MI aged from 60 to > 90 years. It was found that emergency invasive tactics is a method of choice for the treatment of MI in high-risk patients, the majority of whom are elderly and old patients.

Keywords: myocardial infarction, elderly and old patients, invasive tactics.

Introduction

The 20th century has been marked by demographic aging of population in the industrial countries — the redistribution of age structure of population with the increase of the share of elderly and old people. According to the prognoses made by American researchers, by 2025 there will be over 1 billion of people over 60 in the world population (1). The increase of the number of older age groups is a challenge for modern medicine. It is related to the particularities of elderly and old age (involutional changes in the organism, polymorbidity, atypical course of the diseases, changes in social and psychological status), as such patients, as a rule, are at high risk of death. For this reason the choice of the method of treatment should be made with caution and based on the "risk / benefit" ratio.

Elderly and old age of patients is one of the most important risk factors influencing the outcome in myocardial infarction (MI). According to several authors, over 50% of death from MI occur in patients over 75 years old (1-3).

Purpose of study

To compare the effectiveness of conservative and invasive treatment of MI in elderly and old age.

Material and methods

We have compared the effectiveness of conservative and invasive treatment in 656 patients with MI. The patients have been assigned to age groups in accordance with the classification of the periods of aging and old age of the European regional bureau of the World Health Organization (WHO) (4). At first admission clinical characteristics of patients with MI

have been determined with the use of the classification suggested by the All-Union Cardiological Scientific Center of the Academy of Medical Sciences of the USSR (1984), developed on the base of WHO expert guidelines (5).

370 patients were aged from 60 to 74 years, 284 — from 75 to 89 years, and there were 2 patients aged 90 and more. Non ST-elevation MI (nSTEMI) was diagnosed in 344 patients, while 312 had ST-elevation MI (STEMI). In 48,6% of cases MI involved the anterior left ventricular wall, in 43,5% — the inferior/posterior wall, in 7,9% of cases it had another localization. Primary MI was diagnosed in 449 (68,4%) patients: nSTEMI in 203 (30,9%), and STEMI in 246 (37,5%). 207 patients (31,6%) had repeated MI: nSTEMI in 141 (21,5%), and STEMI in 66 (10,1%). 16% of all patients were women. Comorbidities included: arterial hypertension in 73,8% of patients, diabetes mellitus in 20%, signs of chronic heart failure in 49,6%, signs of chronic renal failure in 3,1%; 6,7% of patients had a history of surgical myocardial revascularization.

Conservative treatment in conformity with national and international guidelines for the treatment of MI (6-9) was applied in 530 cases. 48,3% of patients were in the elderly age group (60-74 years), 51,7% — in the old age group (75-89 years). Primary MI was diagnosed in 369 patients (166 — nSTEMI, 203 — STEMI), repeated MI — in 161 patients (113 — nSTEMI, 48 — STEMI).

Invasive treatment (coronary angioplasty with stenting) was applied in 126 cases — among them 91% from the elderly and 9% from the old age group. Among these patients 65 had nSTEMI and 61 had STEMI. Primary MI was diagnosed in 80 (63,5%) patients: nSTEMI — 29,4%, STEMI — 34,1%; repeated MI — in 46 (36,5%): nSTEMI — 22,2%, STEMI — 14,3%. Coronary angiography revealed significant (>79%) single vessel disease in 19,5% of patients, two-vessel disease in 32,5%, three-vessel disease — in 43,9% of patients; isolated lesion of the left main coronary artery was found in 4,1% of patients. In 41% of cases occlusive and stenotic lesions involved the LAD, in 31,4% — the right CA, in 26,8% — the

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circumflex artery. In the presence of the occlusion of the infarct-related artery (IRA) we have performed mechanical recanalization with a guidewire with subsequent predilatation of the occluded area and stenting of the residual stenosis. In cases of subtotal stenosis of the IRA also the predilatation of the involved area and stenting of the residual stenosis were performed. Direct stenting of the IRA was performed in cases of 70-90% stenosis. In 78% of cases we have used bare metal stents «Tsunami Gold» («Terumo», Japan), «Multi-Link Vision» («Abbot Vascular», USA), in 22% — drug-eluting stents: «Cypher» («Johnson & Johnson», USA), «Xience V» («Abbot Vascular», USA), «Taxus» («Boston Scientific», USA). Not later than 6 hours before coronary angioplasty or no later than 2 hours before the intervention the patients received oral Plavix («Sanofi-Synthelabo», France) — 300 mg or 600 mg, respectively. Patients who previously were on Aspirin, received 500 mg, and those who did not intake it — 250 mg of oral Aspirin («Bayer», Germany) not later than 2-6 hours prior to the intervention. At the beginning of coronary angioplasty the patients received an intraarterial bolus of non-fractionated heparin (NFH) (70-100 MU/kg) with subsequent administration of additional dose of NFH to keep the activated clotting time (ACT) within the limits of 250-300 sec. An inhibitor of glycoprotein IIb/IIIa platelet receptors «Monafra» (Framon, Russia) was used during coronary angioplasty in 19,5% of cases. The dosage was calculated at the rate of 0,25 mg per 1 kg of body weight, and the medication was administered as intravenous bolus 10 — 30 minutes prior to the intervention on the coronary arteries. The NFH was administered before the start of coronary angioplasty as an intraarterial bolus (5000 U) and during the whole intervention the ACT was kept within the limits of 200-300 sec. After the intervention the patients received subcutaneously

average doses of low-molecular heparin: enoxaparine sodium — «Klexan» («Sanofi-Aventis», France) or nadroparin calcium — «Fraxiparine» (Glaxo Wellcome Production», USA) for 24 hours; after that the patients received the recommendations to continue oral Aspirin (100 mg) and Clopidogrel (75 mg) daily for 12 months.

Statistical analysis of variance was performed with the use of STATGRAPHICS software (Statistical Graphics System; Version: 2.6; Serial Number: 710240) on IBM/AT. The significance of difference of the studied parameters was assessed using Student test. $P < 0,05$ was considered as statistically significant.

Results and discussion

Comparative characteristics of hospital mortality associated with conservative and invasive treatment of MI in elderly and old patients are presented in Table 1.

Of 530 patients receiving conservative therapy, 115 (21,7%) died during in-hospital stay. Herewith the mortality among elderly patients was 19,9%, and among old patients — 23,4%. Primary MI was associated with 15,4% mortality, repeated MI — with 36% mortality.

In the group of patients ($n=126$), who underwent coronary angioplasty with stenting, the mortality rate was 1,6% (2 patients). Both patients were elderly (1,7%), there were no deaths in the old age group. There were 10 (7,9%) complications related to endovascular intervention on the coronary arteries. Intraoperative MI developed in 1,6% of cases, bleeding from the access artery — in 6,5%, including 2 cases (1,6%) with mild anemia not requiring replacement transfusion.

Conclusions

1. Emergency invasive tactics of the treatment of myocardial infarction, contributing to the restoration

Table 1.
Comparative characteristics of hospital mortality associated with conservative and invasive treatment of myocardial infarction in elderly and old patients

Patients' age (years)	Number of patients (abs.)	Mortality distribution by the forms of MI Abs. (%)				Mortality in age groups	
		nSTEMI primary	nSTEMI repeated	STEMI promary	STEMI repeated	abs.	%
CONSERVATIVE THERAPY							
60 – 74	256	8 (3,1)	23 (9)	15 (5,8)	5 (1,9)	51	19,9
75 – 89	272	9 (3,3)	15 (5,5)	25 (9,2)	15 (5,5)	64	23,4
90 >	2	—	—	—	—	—	
CORONARY ANGIOPLASTY WITH STENTING							
60 – 74	115	—	—	—	2 (1,7)	2	1,7
75 – 89	11	—	—	—	—	—	—

of the infarct-related coronary artery, is the method of choice for high-risk patients, including the majority of elderly and old patients. The mortality associated with percutaneous coronary interventions is 13,5 fold lower than with conservative therapy ($p < 0,001$).

2. The expansion of the network of the departments of endovascular diagnostics and treatment will allow to significantly decrease mortality from myocardial infarction in the population with this pathology in whole, including among elderly and old patients.

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