

ОТДАЛЕННЫЕ РЕЗУЛЬТАТЫ АОРТО-КОРОНАРНОГО ШУНТИРОВАНИЯ ПОСЛЕ СТЕНТИРОВАНИЯ КЛИНИКО-ЗАВИСИМОЙ АРТЕРИИ ГОЛОМЕТАЛЛИЧЕСКИМИ СТЕНТАМИ У БОЛЬНЫХ С ОСТРЫМ КОРОНАРНЫМ СИНДРОМОМ И МНОГОСОСУДИСТЫМ ПОРАЖЕНИЕМ

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Неоптимальные отдаленные результаты эндоваскулярных вмешательств с использованием голометаллических стентов при их широком применении в России при остром коронарном синдроме (ОКС) обуславливают актуальность проблемы влияния вышеуказанных вмешательств на результаты аортокоронарного шунтирования (АКШ), выполненного после стентирования клиничко-зависимой артерии у больных ОКС и многососудистым поражением.

Цель. Изучение результатов АКШ, проведенного в нашем отделении в ранние сроки после стентирования клиничко-зависимой артерии по поводу ОКС голометаллическими стентами, в сравнении с результатами стентирования с использованием стентов с лекарственным покрытием 2-го поколения по данным исследования NORSTENT.

Материалы и методы. Подведены итоги двухлетнего наблюдения пошагового лечения 97 пациентов с ОКС и многососудистым поражением, которым вначале сделано стентирование клиничко-зависимой артерии по жизненным показаниям и затем не позднее 90 сут – АКШ. Пациенты основной группы имели трехсосудистое поражение коронарных артерий, по шкале SYNTAX тяжесть поражения – $26,0 \pm 3,2$ баллов. Время от момента стентирования до выполнения полной реваскуляризации – 64 ± 17 суток. Клиничко-демографические показатели основной группы были статистически сопоставимы с таковыми в группе сравнения (данные исследования NORSTENT).

Результаты. За время наблюдения произошло 2 острых инфаркта миокарда. Повторная реваскуляризация потребовалась у 14 больных (14,4%). Частота событий MACCE – 0,1443. Отношение шансов риска возникновения событий MACCE составило 1,61 (95%ДИ [1,14;2,78]).

Заключение. Хирургическая реваскуляризация коронарного русла в ранние сроки после стентирования клиничко-зависимой артерии с использованием голометаллических стентов у больных с ОКС и многососудистым поражением имеет в 1,61 раза (95%ДИ 1,14;2,78) более высокий риск возникновения неблагоприятных сердечно-сосудистых событий по сравнению с эндоваскулярной реваскуляризацией с использованием стентов 2-го поколения с лекарственным покрытием.

Ключевые слова: острый коронарный синдром; голометаллический коронарный стент; аортокоронарное шунтирование; NORSTENT.

LONG-TERM RESULTS OF CORONARY ARTERY BYPASS GRAFT SURGERY AFTER STENTING OF OBSTRUCTED ARTERY WITH BARE METAL STENT IN PATIENTS WITH ACUTE CORONARY SYNDROME AND MULTIVESSEL DISEASE

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Non-optimal long-term results of endovascular interventions using bare metal stents and their wide use in Russia in acute coronary syndrome (ACS) make it important to study the influ-



ence of the mentioned interventions on the results of coronary artery bypass graft surgery (CABG) performed after stenting of the obstructed artery in patients with ACS and multivessel disease.

Aim. To study the results of CABG performed at our department in early periods of ACS after stenting of an obstructed artery with bare metal stents versus the results of use of drug coated stents of the 2nd generation, on the basis of the data of NORSTENT study.

Materials and Methods. The work presents the results of a two-year observation of stepwise treatment of 97 patients with ACS and multivessel disease who were performed stenting of an obstructed artery for life-saving indications followed by CABG not later than in 90 days. Patients of the main group had three-vessel disease of coronary arteries with severity of damage 26.0 ± 3.2 points on SYNTAX scale. The time from the moment of stenting to complete revascularization was 64 ± 17 days. Clinico-demographic parameters of the main group were comparable with those of the comparison group (data of NORSTENT study).

Results. During observation time two cases of acute myocardial infarction occurred. Repeat revascularization was required in 14 patients (14.4%). The rate of MACCE was 0.1443. Odd ratio (OR) of the risk of MACCE occurrence was 1.61 (95% CI [1.14;2.78]).

Conclusion. Surgical revascularization of the coronary bed in early periods after stenting of the obstructed artery with bare metal stents in patients with ACS and multivessel disease has 1.6 times (95% CI 1.14;2.78) higher risk for initiation of adverse cardiovascular events, in comparison with endovascular revascularization with use of drug coated stents of the 2nd generation.

Keywords: acute coronary syndrome; bare metal coronary stent; coronary artery bypass graft surgery; NORSTENT.

Ischemic heart diseases (IHD) is one the most common diseases making a considerable contribution to the primary disability and mortality [1]. Manifestations of IHD are diseases of the acute coronary syndrome (ACS) group. At present, the optimal strategy of medical care in ACS is surgical revascularization of the myocardium [2]. This strategy may be realized both by using endovascular method, and by the coronary artery bypass graft surgery (CABG) [3]. The long-term results of CABG depend on the condition of the patient, the type and severity of the comorbid pathology [4,5], use of artificial circulation [6,7], types of shunts used [8,9], duration of the surgical procedure. Results of endovascular treatment are first of all determined by type and generation of stents used, implantation technique, amount of implanted stents, length of the stented portion [10,11], existence of comorbid diabetes mellitus, adherence of a patient to treatment [12].

Use of bare metal stents considerably impairs the results of endovascular treatment for IHD, both in comparison with endovascular treatment using drug coated stents and with CABG [13].

In new recommendations of the European Society of Cardiologists [14] the results of randomized studies and meta-analyses are given [15-17] that show that a full one-stage revascularization of the coronary bed in patients with ACS does not reduce mortality and the risk for acute myocardial infarction (MI).

Thus, a choice of the optimal tactics of the coronary bed revascularization in ACS continues to remain a vital question of cardiology [18,19].

Non-optimal long-term results of percutaneous coronary interventions with use of bare metal stents (BMS) [20] and a wide use of them in ACS in Russia make it important to study the influence of these interventions on the results of CABG performed after stent-

ing of an affected artery in patients with ACS and multivessel disease.

Aim – to study the results of the coronary artery bypass surgery performed at our department in early periods of acute coronary syndrome after stenting of an affected artery with bare metal stents in comparison with stenting with drug coated stents of the 2nd generation according to the data of NORSTENT study.

Materials and Methods

The research was conducted on the base of E.I. Korolev Regional Clinical Hospital of Kostroma in the period from 2014 to 2018. All the patients gave consent for processing of the personal data and for medical intervention. The conducted research corresponds to the standards of Declaration of Helsinki. Since no additional medical interventions were performed beyond the frames of standard medical care rendered to the given contingent of patients, no approval of the Local ethical committee was required.

The results of a long-term (within 24 months) observation of stepwise treatment of 97 patients with ACS and multivessel disease in whom stenting of an affected artery was performed for life-saving indications and after that (not later than in 90 days) – CABG.

The first step was stenting of an affected artery with use of BMS (Sinus, Angioline, Russia) for ACS, the second step was full revascularization of the coronary bed using CABG not later than 90 days after stenting.

Withdrawal criteria were age under 18 years and above 80 years, previously implanted coronary stents, absence of adherence to treatment or contraindications to intake of anticoagulants and/or disaggregants, oncological diseases, diseases of blood system, chronic renal failure, low ejection fraction of the left ventricle (<30%), existence of comorbid pathology requiring surgical treatment, impossibility to perform CABG, severity of damage to coronary bed on SYNTAX scale

less than 22 or more than 33 points.

According to Holter ECG monitoring, all patients after stenting of the affected artery had ischemic alterations of the myocardium.

Monitoring of patients for evaluation of the combined end point MACCE (*Major Adverse Cardiovascular and Cerebrovascular Events*: cardiovascular mortality, MI, acute disorder of the cerebral circulation, repeated revascularization) was conducted in the hospital and outpatient stages with periodicity once a month.

The mean age of patients (n=97, 86% of men) was 59.8 ± 6.5 years. In 44 patients (45.4%) PCI of the affected artery was conducted for ACS with elevation of ST segment, in 53 patients (54.6%) – without elevation of ST segment.

The rate of risk factors, of comorbid diseases: hyperlipidemia – 92 patients (95%), arterial hypertension 94 (97%), stable angina of III-IV functional class by classification of Canadian Cardiovascular Society – 93 (96%), diabetes mellitus – 18 (19%), generalized atherosclerosis – 46 (47%), tobacco smoking – 29 (30%), MI in history – 30 (31%). The ejection fraction after PCI of the obstructed artery was $56 \pm 8\%$.

All patients included into the analysis had three-vessel disease of coronary arteries, with severity of damage 26.0 ± 3.2 points on SYNTAX scale. In 33 (34%) patients the obstructed artery was the anterior descending artery, in 31 (32%) patients – the circumflex artery, and in 33 (34%) – the right coronary artery. Revascularization of the obstructed artery required on average 1.15 ± 0.50 stents, the length of stented portion – 26.0 ± 7.5 mm, diameter of stents – 3.1 ± 0.5 mm.

Success of PCI was determined by the following criteria: TIMI flow 3, residual stenosis not more than 10%, disappearance of objective and subjective symptoms of acute ischemia of the myocardium after the intervention. The average time from the moment

of PCI of the affected artery to CABG was 64 ± 17 days. Before PCI the patients received the loading dose of clopidogrel and were also administered acetylsalicylic acid, clopidogrel, beta-blockers, statins and inhibitors of angiotensin-converting enzyme.

It should be noted that clinico-demographic parameters of our group of patients somewhat differed from the averaged

data of NORSTENT study [20] that demonstrated the results of endovascular revascularization with use of drug coated stents of the 2nd generation (Table 1). In particular, in our group there was a higher statistically significant rate of hyperlipidemia, arterial hypertension, past MI. However, we believe this was not a serious limitation in the interpretation of the obtained results.

Table 1

Clinico-Demographic Characteristics of the Analyzed Group of Patients in Comparison with NORSTENT Research [20]

Parameter	Our Group (n=97)	NORSTENT (n=4504)	p
Age, years	59.8 \pm 6.5	62.6 \pm 10.8	0.68
Men, %	86	75	0.24
Hyperlipidemia, %	95	54	<0.001
Arterial hypertension, %	97	43	<0.001
Stable angina III-IV functional class, %	96	99.6	0.97
MI in history, %	31	9.6	<0.001
Diabetes mellitus, %	19	13	0.15
Smoking, %	30	34	0.47

Statistical processing was conducted in Statistica 13.3 program (StatSoft Inc., USA). The quantitative variables were analyzed by calculation of the mean value and of standard deviation. The qualitative variables are given in %. The data were compared using the odd ratio for adverse cardiovascular events. Statistical significance was established with the probability of the first type error less than 5%.

Results and Discussion

During observation, 2 events of the cardiovascular death occurred due to acute MI (in the period of 9 to 12 months) after CABG surgery. Repeat revascularization was required in 14 (14.4%) patients. MACCE rate was 16.5% (16 cases); MACCE rate in NORSTENT research was 10.9% (491 cases).

The odd ratio for the risk of MACCE occurrence was ((95% confidence interval (CI) [1,14;2,78]), that is, the risk for adverse cardiovascular events in the group of CABG

with earlier successful revascularization of the obstructed artery by PCI method with use of BMS was 1.61 times that in the endovascular revascularization of the coronary vessels using drug coated stents of the 2nd generation.

In numerous research works for comparison of the results of endovascular revascularization using both BMS and drug coated stents excluding the latest-generation stents, with the results of CABG, endovascular revascularization is inferior to CABG in terms of MACCE criterion due to a high rate of repeat revascularizations [20-22]. With this, by the rate of revascularization the main cause of which being restenosis, BMS are inferior to drug coated stents.

The result obtained in the research that showed a higher risk for occurrence of adverse cardiovascular events (1.61 times higher) in the stepwise strategy of revascularization (stenting of the obstructed vessel with BMS

and full revascularization using CABG method) as compared with endovascular revascularization using the 2nd-generation drug coated stents, evidences that use of bare metal stents considerably impairs the long-term results of CABG and is inferior to PCI using the 2nd-generation drug coated stents (this conclusion is justifiable since we compared revascularization strategies in the same groups of patients).

In view of the above we think *it should be borne in mind that implantation of MBS into the obstructed artery of patients with ACS and multivessel disease impairs long-term prognosis of the surgical method of full revascularization of the myocardium.*

Unsatisfactory results of CABG are probably associated with a high rate of restenosis linked with use of BMS. The problem

may be solved by use of only drug coated stents in patients with ACS or by obligatory application of anastomose in CABG distally to the portion of the coronary bed stented with BMS, which will probably improve the result, but however, this matter requires further investigation.

Conclusion

Surgical revascularization of the coronary vascular bed in the early period after stenting of the obstructed artery in patients with acute coronary syndrome and multivessel disease using bare metal stents is associated with 1.61 times higher risk (95% CI 1.14;2.78) for adverse cardiovascular events in comparison with endovascular revascularization using 2nd-generation drug coated stents.

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Дополнительная информация [Additional Info]

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