Benefit of cardiac rehabilitation programme in revascularized coronary patient

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Abstract

Objective: Evaluating the cardiovascular risk profile in revascularized coronary patients at 16 months after revascularization (PCI+CABG). Material and method: We evaluated the cardiovascular risk profile, compliance to the secondary prevention measures and reaching guideline targets in revascularized coronary patients included in EuroASpire III Romania. The patients were divided in two groups: the selection criteria was the adherence to cardiac rehabilitation programme (CRP+/CRP-). Result: The prevelence of cardiovascular risk factors was about 76%, with an increased significance in CRP- group (p<0.05). The evaluation of lipidic risk factors in the whole lot showed increased values in total cholesterol (182+52.61mg/dl), LDL-cholesterol (109.72+44.60mg/dl) and serum triglyceride (163.94+99.98mg/dl). The group with CRP+ registered significant smaller values of total analised variables compared to those who did not participate in CRP (p<0.05). 31% of integral lot received the indication for inclusion in CRP. The total lot compliance was about 19%. Patients in CRP+ group had reached the recommended guideline targets for cardiometabolic and hemodynamic profile in a significant proportion (p<0.05, OR<1). No significant statistic difference was observed between the two groups regarding smoking cessation and the normalize anthropometric parameters that define obesity (p>0.05, OR>1). Conclusion: At 16 months after revascularisation, the patients still present a high risk. The level of cardio-metabolic and hemodynamic risk are maintained the same by unreaching the targeted values recomended by ESC prevention guideline. The patients in CPR+ group had a significant improvement of cardiovascular risk factors. Indication but also compliance to structured cardiac rehabilitation programme after myocardial revascularisation remains at a suboptimal level.

*Key word*s: *cardiac rehabilitation, secondary prevention, revascularized coronary patient.*

Rezumat

Obiectiv: Evaluarea profilului de risc cardiovascular al coronarianului la 16 luni post revascularizare (PCI+CABG). Material şi metodă: Am evaluat profilul de risc cardiovascular, complianţa la măsurile de profilaxie secundară şi atingerea ţintelor la coronarienii revascularizaţi incluşi în studiul EuroAspire III România, în funcţie de participarea sau nu la programul comprehensiv de recuperare cardiovasculară (PR+/PR-). Rezultate: Prevalenţa factorilor ce definesc riscul cardiovascular a fost de 76%, cu creştere semnificativă în lotul PR- (p<0.05). Evaluarea factorilor de risc lipidic în lotul integral a evidenţiat valori crescute ale colesterolului total (182+52.61mg/dl), LDL-colesterolului (109.72+44.60mg/dl) şi ale trigliceridelor serice

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(163.94±99.98mg/dl). Lotul cu PR+ a înregistrat valori semnificativ mai mici pe toate variabilele analizate comparativ cu non-participanţii la PR (p<0.05). Indicaţia de includere în programul de recuperare a fost facută la 31% din lot, iar complianţa a fost de 19%. Pacienţii incluşi în programul de recuperare au atins ţintele conform recomandărilor de ghid pentru profilul cardio-metabolic şi hemodinamic într-o proporţie semnificativ mai mare decât cei care nu au participat la PR (p<0.05, OR<1). Nu s-au observat diferenţe semnificative statistic între cele două loturi, în ceea ce priveşte renunţarea la fumat şi normalizarea indicilor antropometrici ce definesc obezitatea (p>0.05, OR>1). Concluzii: La 16 luni post revascularizare, coronarienii rămân încă la risc cardiovascular foarte înalt. Riscul cardiometabolic şi cel hemodinamic sunt menţinute de neatingerea valorilor ţintă conform recomandărilor ghidului SEC de prevenţie. Doar cei din lotul PR+ au ameliorare semnificativă a riscului cardiovascular. Indicaţia, dar şi complianţa la un program structurat de recuperare post-revascularizare rămân la un nivel subliminal.

Cuvinte cheie:reabilitare cardiacă, prevenţie secundară, pacient coronarian revascularizat.

Introduction

Today myocardial revascularization has become a common modality in treating patients with coronary heart disease (CHD).

Revascularization procedures (PCI/CABG) assure the saving of ischemic myocardium but doesn't influence the risk and the evolution of atherosclerosis process.

EuroAspire I (1995-1996) and II (1999-2000) demonstrated that lifestyle and risk factors management is far from the optimal level in revascularisesed coronary patients and that exist a considerable potential in risk reducing still exist. Improvement in life expectancy indicate a different necessity to expand and implement some actions that are needed in secondary prevention in an organised cost efficient manner (1, 2, 3, 4, 5).

Our main objective is to determine if revascularized coronary patients included in a comprehensive cardiac rehabilitation programme achieve a better risk profile versus non-participants, beyond revascularization.

The „target values" of the studied variables were setteled according to European Guideline of Cardiovascular Prevention (1).

Statistic analysis: the following variables were expressed as medium value ± standard deviation;

Material and method

We evaluated the cardiovascular risk profile, the compliance to the secondary prevention measures and reaching guideline goals in 463 revascularized coronary patients (percutaneous transluminal coronary angiography with stent/coronarian aortic by-pass graft) included in EuroAspire III Romania study.

The patients were clasified in two groups according to their participation into comprehensive CRP.

In the evaluation of cardiovascular profile risk, we included: the antropometric parameters (body mass index, waist circumference), the cardiometabolic parameters (glycemia a jeun, serum triglyceride, total cholesterol, HDL-cholesterol and LDL-cholesterol) and hemodinamic parameters (systolic and diastolic blood pressure).

The biochimic parameters were expresed in mg/dl. We mention that the biological evaluation technic were up to the standard. We utilised questioner method in order to quantify the secondary prevention measures that patients benefited in the rehabilitation programme.

we calculated percentage from lot; subgroup comparison were validated using test T Student for parametric variables and test Chi square for categoric variables (p<0.05 was considered significant from statistic point of view). Statistic

analysis was performed using the statistic program Epi Info 6 (version 6.04d).

Results

Interventional revascularized patients predominate (69.3%), in comparison to surgical revascularized patients (30.7%). Majority of the subjects were males (74.3%) and medium age in integral lot was 61 ± 9.68 years (figure 1). The study lot was characterised by supraponderals (BMI= 29.43 ± 4.30kg/m²) and the medium systolic arterial pressure were 143.52 ± 22.09 mmHg. Metabolic evaluation showed an increase in total cholesterol (182.19 ± 52.61), serum trigluceride (163.94 ± 99.98) and blood fasting glicemia (134.68 ± 48.68). Basal characteristics of the lot study are represented in table I.
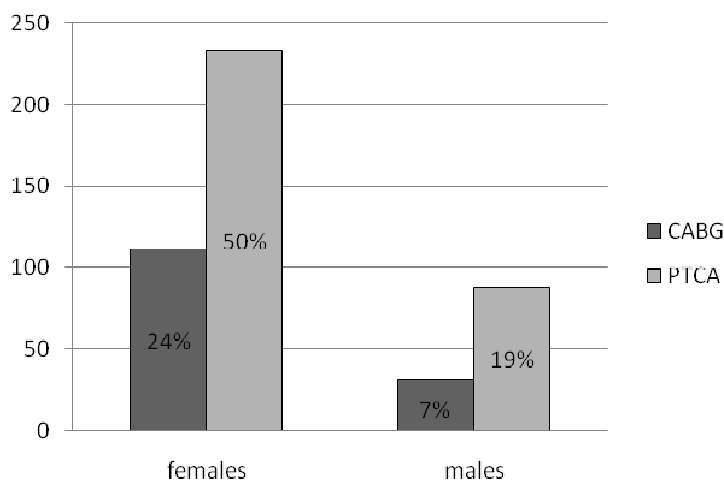

Figure 1. Lot structure in function of sex and revascularisation method

Table I. Integral lot basal characteristics

Variables	Medium values± standard deviation	Minimum values	Maximum values
Age	61.48 ± 9.68	31	86
BMI (kg/m²)	29.43 ± 4.30	18.11	44.24
Circumference (cm)	101.9 ± 11.21	68	140
SBP (mmHg)	143.52 ± 22.09	96	233
DBP (mmHg)	82.57 ± 11.98	53	123
TC (mg/dl)	182.19 ± 52.61	94.23	437.69
LDL (mg/dl)	109.72 ± 44.60	45.02	336.02
HDL (mg/dl)	40.74 ± 8.7	22.69	74.23
TG (mg/dl)	163.94 ± 99.98	36.36	775.45
Glycemia (mg/dl)	134.68 ± 48.67	84.54	470.90

BMI – body mass index; SBP – systolic blood pressure DBP – diastolic blood pressure, TC - total cholesterol, LDL-low density cholesterol, HDL – high density cholesterol, TG – triglyceride

Epidemiologic profile of analised lot indicated an increased frequency of traditional risk factors (obesity, smoking, dislypidemia, arterial hypertension and diabetes mellitus) and non modifiable risk factors (family history of premature coronary heart disease in grade I realtive and age over 55 years old for men and 65 for women) as shown in figure 2.
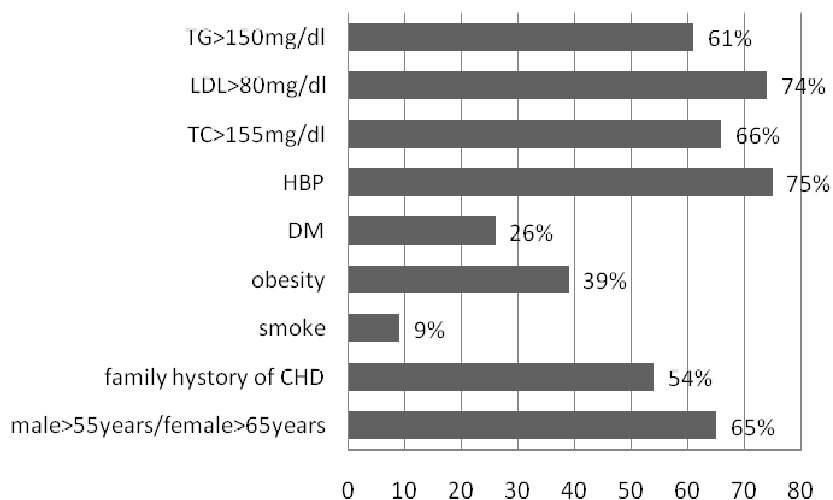
Figure 2. Epidemiological profile of integral lot

After the revascularisation procedure, cardiac rehabilitation programme (CRP) were recomended in 144 patients (42 surgical revascularised and 102 interventional revascularised), and only 61% of them were compliant and benifited from the secondary prevention program; we mention that the rest of patients did not receive any indication for cardiovascular rehabilitation (figure 3).

The indication of cardiac rehabilitation was higher post PTCA (31%) versus surgical revascularisation (29%) and CABG patients were more responsive to secondary prevention measures than those with PTCA, also males (19%) versus females (17%).
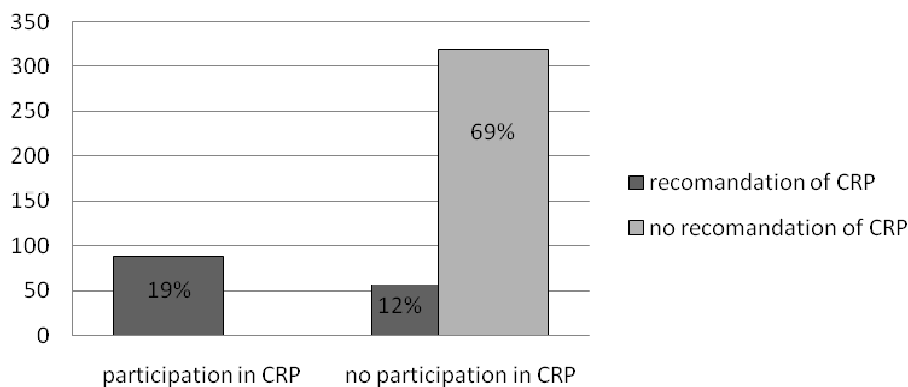

Figure 3. Recomandation and compliance in CRP

Table II. Secondary prevention measures included during CRP

Secondary prevention measures	Frequency (n)	Percent (%)
Educational materials	12	13.63
Instruction sessions for health promotion	23	26.13
Smoking cessation	36	40.90
Diet modification/wight control	81	92.04
Surpervised program of physical activity	88	100.0
Stress modification and relaxation technics	27	30.68
Pharmacologic treatment	88	100

We utilised questioner method in order to quantify the secondary prevention measures that patients benefited in the rehabilitation programme; data obtained are presented in table II.

There was no significant difference of basal characteristics in the rehabilitation group versus non-rehabilitation group (p>0.05).

Patients included in the CPR reached the recommended targets for LDL-cholesterol, HDL-cholesterol, serum triglyceride, fasting glycemia and arterial blood pressure in a higher proportion than those who didn't participate in the CPR (p<0.05; OR<1).

Table III. Proportion of patients reaching guidelines

Variabiles	CPR- n=375	CPR+ n=88	p	OR	IC
Smoking cessation	77	15	0.330	1.26	0.66-2.43
Waist <88 (female); <102 (male)	158	30	0.206	1.41	0.84-2.36
BMI <25kg/m^2	55	10	0.527	1.34	0.63-2.96
TC <155mg/dl	121	50	0.00006	0.38	0.23-0.62
LDL <80mg/dl	96	39	0.0008	0.43	0.26-0.72
HDL >40mg/dl (bărbaţi); >50mg/dl (femei)	146	49	0.006	0.51	0.31-0.83
TG <150mg/dl	218	61	0.007	0.61	0.36-1.04
Glycemia <110mg/dl	103	21	0.0058	0.50	0.30-0.83
BP <130/80mmHg	80	38	0.00004	0.36	0.21-0.60

CPR+ = participation in cardiac rehabilitation program; CPR- = no participation in cardiac rehabilitation program; OR=odds ratio; IC – confidence interval

Discussions

The cardiovascular risk profile of revalcularized coronary patients, at 16 months after revascularisation reamains high due to increase prevelance of cardiovascular risk factors and from inability to reach the target value reccomended by current guidelines.

EuroAspire studies I and II showed that implementing the secondary prevention measures in revascularized coronaries is modest and adherence to the comprehensive rehabilitation programme is still poor represented (4,5).

Since the results of our study showes that targets are reached in a small proportion of patients at 1.4 years after revascularization (33,91% for total cholesterol, 26.14% for LDL-cholesterol, 38.66% for HDL-cholesterol, 58.96% for serum triglyceride and 25.26% for fasting glycemia), there is a strong need for reinforcing secondary prevention measures; this point of view is emphasize even in anterior studies

as much as in recent guideline of cardiology prevention.

EuroASpire III study results were recently published and showed that in Romania, a limited number of patients with coronary heart disease were included in the complex cardiac rehabilitation programme, that associate supervised physical activity, pharmacologic and non pharmacologic measures. The results were similar in the great majority of european countries (15).

Eric Peterson et al demonstrated that revascularized coronary patients who performed supervised physical training are more responsive to the secondary prevention measures, respectively weight control, diet, drug treatment. Usually these preventive measures are not sufficiently implemented in the first phase of the rehabilitation programme following revascularisation (2,7,8).

Patients from our study included in CRP reached the target according to the recommended guideline for LDL-cholesterol, HDL-cholesterol, serum triglyceride,

blood fasting glycemia and blood pressure in a higher poroportion than those who didn't participate in the CRP (p<0.05; OR<1).

In the same contex, Joep perk showed lipid profile improvement in revascularised coronary patients in direct relation with participation at the comprehensive CRP, independent of the prescribed hipolipemiant treatment (8, 11, 12).

Comprehensive cardiovascular rehabilitation is probably a more efficient approach for reducing cardiovascular risk and long term management of revascularised coronariens (14, 16).

Conclusions

After 16 months post revascularisation, the patients with coronary heart disease remain at high cardiovascular risk. Cardio-metabolic and hemo-dynamic risk is maintain due to the inability to reach the target value that is recomended by the 2007 ESC prevention guideline.

Only those who participated in a comprehensive CRP proved significant cardiovascular risk improvement.

Indication and also compliance to structured rehabilitation programme after revascularization remains at a suboptimal level.

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