Predictors of maintaining cardiac rehabilitation’s benefits after a year for a coronary patient

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Introduction Prognosis of coronary heart disease depends on correction of cardiovascular risk factors and long-term maintenance. Little data exist on the relationship between the patient’s profile and durable adhesion to the new learned behaviors in cardiac rehabilitation. The aim of our study was to investigate predictors of maintaining the cardiac rehabilitation program benefits at one year.

Methods From November 2012 to December 2013, 127 patients undergoing cardiac rehabilitation after a coronary event were included. One year after the end of the program, four main goals (smoking cessation, body mass index <25, regular physical activity and professional recovery) were collected. We analyzed their relationship with clinical and socio-demographic data.

Results Smoking cessation was significantly associated with regular physical activity. Body mass index <25 was significantly associated with absence of diabetes (p=0.016) and dyslipidemia (p=0.005). Regular physical activity was significantly associated with BMI lower (28.8 vs27,p=0.046). Professional recovery was significantly associated with Left Ventricular Ejection Fraction >55% (p=0.037), dyspnea NYHA 1 (p=0.015) and better functional abilities at the end of rehabilitation cycle (8.1 mets vs 6.4 mets, p<0.001) and one year later (7.4 mets vs 5.1 mets p=0.001).

Conclusion LVEF preserved, low degree of dyspnea, functional abilities >6 METs appear as positive prognostic factors for professional recovery. Our study highlights the constant interaction between correction of cardiovascular risk factors and adaptation of lifestyle (activity, diet). Patients with many cardiovascular risk factors fail in achieving or maintaining the goals acquired during cardiac rehabilitation program, since several simultaneous changes in behavior are required. Because of the chronic and multifactorial nature of coronary artery disease, new personalized monitoring strategies should be thoughtful, to ensure personalized care.

The author hereby declares no conflict of interest

Benefits and safety of early referral to cardiac rehabilitation after acute coronary syndrome

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Background Cardiac rehabilitation (CR) is recommended after acute coronary syndrome (ACS), as it reduces morbidity and improves quality of life. In France, about 20 to 30% of patients are referred to CR after ACS. The aim of our study is to evaluate if early referral (<7 days) is safe and if it provides immediate further benefits.

Methods From April 2014 to April 2015, thirty nine patients were referred to CR after their discharge from cardiac care unit (one center). The early referral group (ERG) included 16 patients, all of them had their first medical contact in CR within 7 days after ACS. The late referral group (LRG) included 23 patients. All patients had physical examination, electrocardiogram, echocardiography and exercise test (ExT) before and at the end of CR.

Results 21% of patients hospitalized for ACS were referred to CR. Mean age was 55.5±9.8 years with only 3 females (7.6%). The characteristics of each group are summarized in table.

Abstract 0487 – Table: Characteristics of each group

<table>
<thead>
<tr>
<th></th>
<th>ERG (n=16)</th>
<th>LRG (n=23)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Years)</td>
<td>58.8±10.8</td>
<td>53.5±9.7</td>
<td>P=0.04</td>
</tr>
<tr>
<td>BMI (Kg/m2)</td>
<td>25.6±2.7</td>
<td>25.08±2.6</td>
<td>NS</td>
</tr>
<tr>
<td>Hypertension (%)</td>
<td>37.5</td>
<td>34.7</td>
<td>NS</td>
</tr>
<tr>
<td>Diabetes (%)</td>
<td>18</td>
<td>17.3</td>
<td>NS</td>
</tr>
<tr>
<td>Smoking (%)</td>
<td>81.2</td>
<td>69.56</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>ACS complications</td>
<td>12.5</td>
<td>21.7</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>Delay ACS-First medical CR contact (days)</td>
<td>5.8±1</td>
<td>13.7±8.6</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>Delay ACS-CR starting (days)</td>
<td>18.4±15</td>
<td>25.4±14</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>LV EF (%)</td>
<td>54.2±6.6</td>
<td>60.8±7.7</td>
<td>NS</td>
</tr>
<tr>
<td>ExT before CR</td>
<td>7±1.1</td>
<td>6.9±1.6</td>
<td>NS</td>
</tr>
<tr>
<td>METS</td>
<td>128.7±27.3</td>
<td>126.5±34.7</td>
<td>NS</td>
</tr>
<tr>
<td>Workload (watts)</td>
<td>11.1±2.2</td>
<td>11.4±2.4</td>
<td>NS</td>
</tr>
<tr>
<td>Number of CR sessions</td>
<td>0</td>
<td>8%</td>
<td>NS</td>
</tr>
<tr>
<td>Complications during CR (%)</td>
<td>8.4±2.7</td>
<td>8±1.9</td>
<td>NS</td>
</tr>
<tr>
<td>Ext after CR</td>
<td>152.8±32</td>
<td>151.3±43.3</td>
<td>NS</td>
</tr>
<tr>
<td>METS</td>
<td>Workload (watts)</td>
<td>128.7±27.3</td>
<td>126.5±34.7</td>
</tr>
</tbody>
</table>

No complications occurred during CR in ERG, for the LRG 2 patients had chest angina due to an incomplete initial revascularization procedure.

Conclusion Referral rate to CR after ACS is in the range of French national rates. Benefits of CR are similar independently from referral delay. CR is also safe even when started early after ACS.

The author hereby declares no conflict of interest

High-intensity interval training versus moderate continuous training in coronary artery disease. A randomized controlled trial

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Background Exercise-based cardiac rehabilitation increases peak oxygen uptake (peak VO2), which is the most important prognostic factor in cardiac patients. However, the most effective training strategies (interval training (IT) or moderate continuous training (MCT)) have yet to be identified in coronary artery disease patients. Our objective was to compare the effectiveness and the tolerance of those two modes of exercise during cardiac rehabilitation after an acute coronary syndrome (ACS) in a large single-center randomized study.

Methods From July 2014 to April 2015, one hundred and three patients (88% male, mean age 62 years, mean LVEF 56%) performed 20 sessions, 2-3 sessions/week, including 35min of biking, after a randomization to either high-intensity IT (6 cycles of 2min at 90% peak VO2, alternating with active recovery) or to MCT (at 1st ventilatory threshold).

Results Baseline characteristics between the 2 groups (49 in IT and 54 in MCT) were comparable. Both exercise programs demonstrated significant
positive effects on aerobic capacity. Compared to MCT, IT program tended to increase mean peak VO$_2$ and the peak workload (weighted mean difference $+4.3 \pm 3.3$ vs $+2.7 \pm 4$ ml/kg/min, $p=0.06$ and $+22.8 \pm 14.6$ vs $+22.8 \pm 14.6$ Watt, $p=0.09$ respectively). No adverse event was reported during training sessions.

**Conclusion** Interval Training was more effective for the improvement of peak VO$_2$ than MCT.

The author hereby declares no conflict of interest

0238

**Short-term impact of an ambulatory cardiac rehabilitation program on arterial rigidity**

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**Background** If the positive impact of cardiac rehabilitation on metabolic profile and exercise tolerance is well documented in the literature, very few studies evaluated the impact of these rehabilitation programs on arterial rigidity.

**Purpose** The main objective of this study was to determine if a short and intense 4-week cardiac rehabilitation program could yield a positive impact on arterial rigidity.

**Method** A cohort study was performed on Leopold Bellan foundation. One hundred and ninety eight cardiac patients referred for cardiac rehabilitation program after acute events were included in this study. Arterial stiffness is defined by a PWV value greater or equal to 10.

**Results** At the beginning, 59% of our patients have rigid arteries. After 20 sessions of cardiac rehabilitation, this number is significantly reduced to 51% ($p<0.12$). Patients with arterial stiffness have accumulated more major cardiovascular risk factors, and have had less exercise capacity than others. However they benefit similarly from the cardiovascular rehabilitation program.

**Conclusion** We observed that arterial stiffness, as reflected by the PWV, tends to decrease after short-term ambulatory cardiac rehabilitation program. Short ambulatory cardiac rehabilitation program for cardiac patient after an acute event has a positive effect on arterial rigidity.

The author hereby declares no conflict of interest

0240

**Cardiac rehabilitation in diabetic patients**

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**Introduction** Diabetes mellitus (DM) is increasing in prevalence in France and is now more common in patients entering cardiac rehabilitation (CR). Only a few studies have focused on the effects of cardiac rehabilitation in patients with DM but it is still unclear if they gain the same benefit from a CR program as do non diabetics.

**Objectives** The aim of this study was to compare the effects of exercise-based CR on cardiac risk factors and exercise parameters in a series of diabetic and non diabetic individuals.

**Methods** Between 2009 and 2013, 386 patients were consecutively referred to our institution after an acute cardiac event. Our CR program consists of 4 weekly sessions of 5 weeks (20 sessions) of CR program.

**Results** The prevalence of diabetics, in our ambulatory cardiac rehabilitation center was 29% (113 patients). Hypertension, obesity, and dyslipidemia were more common in diabetic vs non diabetic participants ($p<0.001$ for all). Diabetic patients had increased SBP, triglyceride concentrations, weight and carotid femoral pulse wave velocity (PWV), but decreased HDL concentrations compared with non diabetics at the start of CR ($p<0.05$ for all). Initial exercise capacity parameters (Wpeak, VO$_2$ peak/kg, 6 minute walk test) were lower in diabetics vs nondiabetics ($p<0.001$). Both diabetics and non diabetics showed significant improvement in quality of life, SBF, DBP, lipid profile, and exercise capacity after CR.

**Conclusion** This study emphasizes similar beneficial effects of multidisciplinary CR program on exercise capacity and quality of life in patient with or without type 2 diabetes mellitus. A significant benefit can be seen after 5 weeks (20 sessions) of CR program.

The author hereby declares no conflict of interest

0242

**Inhibition of platelet function with aspirin and P2Y12 receptors antagonists in stable coronary patients undergoing intense physical activity**

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**Background** According to European guidelines, patients with stable coronary disease should undergo moderate-to-vigorous intensity exercise. Intense physical activity may have a negative impact on platelet aggregation and the protective effect of antiplatelet (AP) drugs is not documented. The aim of our study was to assess the effect of aspirin (ASA) and P2Y12 receptors antagonists (P2Y12-RA), before and immediately after intense physical activity.

**Methods** We performed a prospective single center cross-over study. Patients had to be treated with dual AP therapy including ASA and P2Y12-RA (Clopidogrel or Prasugrel), at least 6 months after an acute coronary syndrome (ACS) but less than the recommended one year, in the absence of significant left ventricular sequelae or residual ischemia. A first Stress test was done with ASA and Clopidogrel or Prasugrel, then, after 2 weeks, the P2Y12-RA was switched (Prasugrel instead of Clopidogrel and vice versa) and a second Stress test was performed. Platelet responses were analyzed by Aspirin Reaction Units (ARU) and P2Y12 Reaction Units (PRU) measurements, before and immediately after Stress test.

**Results** 23 patients (all men; mean age 57, 7 years) undertaking dual AP therapy (ASA-75mg plus Prasugrel-10mg or ASA-75mg plus Clopidogrel-75mg per day) were recruited. Mean Peak Activity reached was 164, 8 Watts. Mean exercise duration was 11.5 minutes. Mean Maximal Heart Rate reached was 135 beats per minute. Before and after stress test: PRU (reference range ¿250) was 124.5 and 112.8 ($p=0.5$) and 56.7 and 54.8 ($p=0.8$) respectively with Clopidogrel and Prasugrel, ARU (reference range ¿550) was 433.2 and 398.7 ($p=0.01$).

**Conclusion** In patients treated after an ACS, inhibitory effects of dual AP therapy are not modified during physical activity. The inhibitory effect of ASA seems even better immediately after a stress test. This is for a resumption of intense physical activity after six months.

The author hereby declares no conflict of interest

0255

**Gender related differences on cardiac rehabilitation benefits for heart failure**

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**Background** Female heart diseases are underdiagnosed and undertreated. They are also probably under referred to cardiac rehabilitation (CR). The aim of our study is to compare CR benefits between men and women.

**Methods** A total of 442 patients suffering from heart failure were referred to our center for CR between 2010 and 2014. Only 67 were women (15%). All patients had physical examination, electrocardiogram, echocardiography and a cardio-pulmonary exercise test (CPET) before and at the end of CR.