Cardiac Rehabilitation
- How are we doing?

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President of the Danish Society of Cardiology
Odense University Hospital and Aalborg University
Cardiac Rehabilitation 2012

- Definition
- Evidence
- Core components
- How are we doing in Europe?
- Barriers
- Future
Definition

Cardiac rehabilitation programs were developed to ensure the best possible physical, psychological, and social conditions so that patients after a heart attack may preserve or resume their proper place in society.

Today cardiac rehabilitation programs should consist of a multi-faceted and multi-disciplinary approach to overall cardiovascular risk reduction, including secondary prevention programs with the assessment and modifications of risk factors.
# Three Phases

<table>
<thead>
<tr>
<th>Phase I</th>
<th>Phase II</th>
<th>Phase III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management at CCU</td>
<td>Cardiac Rehabilitation/secondary prevention</td>
<td>Follow-up in co-operation primary health care</td>
</tr>
</tbody>
</table>
What’s the overall impact of CR on events?

- **Relative Risk**
  - 0.50
  - 0.75
  - 1.0
  - 1.25

**Need for PTCA**
- N=12 trials

**Need for CABG**
- N=23 trials

**Non fatal MI**
- N=33 trials

**Cardiac Mortality**
- N=31 trials

**Total mortality**
- N=41 trials

FAVOURS REHABILITATION
Core components 2012

- Patient assessment with medical control
- Physical activity counselling
- Prescription of exercise training
- Diet/nutritional counselling
- Weight control management
- Lipid management
- Blood pressure monitoring and management
- Smoking cessation
- Vocational support
- Psychosocial management
Objectives

To describe

- The current status of cardiac rehabilitation in Europe

- Whether participation in CRP results in healthier lifestyle and risk factor control, and in more appropriate use of prophylactic drug therapies in patients with established CHD.
### EUROASPIRE III

**Distribution by age, gender and diagnostic category**

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>8845</td>
</tr>
<tr>
<td>females</td>
<td>25%</td>
</tr>
<tr>
<td>≥ 60 years</td>
<td>64%</td>
</tr>
</tbody>
</table>

**Diagnostic category**

- CABG: 20%
- PCI: 42%
- AMI: 19%
- Ischaemia: 19%

*OUH Odense Universitetshospital*
Advise to follow a CRP programme* by country

* Within 3 months of discharge following the index event or procedure

All patients: 45%
Men 46%
Women 42%
EuroCaReD: The European Cardiac Rehabilitation Database

- Web-database
- To collect information on service provision and outcomes in CR in European Centres
- 1,236 patients from 8 countries (October and November 2010)
Predictors of drop-out from cardiac rehabilitation programs in Europe


Background

Substantial numbers of patients participating in cardiac rehabilitation (CR) do not complete their programs prescribed because of early discontinuation. The purpose of this study was to assess reasons and predictors of drop-out from different CR programs focused on European countries.

Methods

European Cardiac Rehabilitation Database (EuroCaReD) was introduced to get information on service provision and outcomes in CR across Europe. In 16 European countries participating in EuroCaReD, CR program could be compared into the database. Among the 1,236 patients, 360 patients (29%) were included in the study. Reasons for non-completion of the CR program were analyzed (55% CI).

Results

273/360 patients (70%) completed the CR program whereas 87 patients (24%) did not complete the CR program. An analysis of factors significantly related to non-completion was performed (p<0.05, OR 2.24 (1.06-4.79)). Higher body weight (p=0.05), higher blood pressure (p<0.01) and lower METs achieved at program start (p=0.05) were also predictors of early drop-out from a CR program. Age, gender, and the initiating event did not influence the drop-out rate.

Conclusion

In European countries, 30% of patients referred for CR did not complete their programs as prescribed. This result identifies the need for measures to reduce drop-out rates in CR. Patients who have to interrupt their program because of interferences must frequently be readmitted as soon as possible. Because of the drop-out risk in patients with special comorbidities, particularly renal failure and history of stroke, and in patients with higher cardiovascular risk burden and lower exercise capacity, these subgroups should receive special attention. The high percentage of patients with unspecified reasons of CR program interruption needs further investigation.

- 273/360 patients (70%) completed the CR programme
- 30% drop outs

Fig. 1: EuroCaReD - 1st snapshot countries and patients

Table 1: Reasons for drop-out from CR programs

<table>
<thead>
<tr>
<th>CR program completed</th>
<th>76%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR program not completed</td>
<td>24%</td>
</tr>
<tr>
<td>- Renal failure</td>
<td>66%</td>
</tr>
<tr>
<td>- Patient non-compliance</td>
<td>11%</td>
</tr>
<tr>
<td>- Others</td>
<td>11%</td>
</tr>
</tbody>
</table>

Table 2: Indicators and events leading to drop-out from CR programs

<table>
<thead>
<tr>
<th>Indicators for drop-out</th>
<th>Initiating event for drop-out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renal failure</td>
<td>P=0.03</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>PCF</td>
</tr>
<tr>
<td>Lower METs achieved</td>
<td>P=0.05</td>
</tr>
<tr>
<td>Initial event</td>
<td>Others</td>
</tr>
<tr>
<td>CV death</td>
<td>2</td>
</tr>
<tr>
<td>Non-CV death</td>
<td>1</td>
</tr>
<tr>
<td>CAG</td>
<td>1</td>
</tr>
<tr>
<td>PCI</td>
<td>1</td>
</tr>
<tr>
<td>CV death</td>
<td>1</td>
</tr>
<tr>
<td>Non-CV death</td>
<td>1</td>
</tr>
<tr>
<td>Others</td>
<td>1</td>
</tr>
</tbody>
</table>
### EuroCaReD
**1st snapshot: drop-outs before end of program**

<table>
<thead>
<tr>
<th>CRP completed [%]</th>
<th>70</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CR not completed [%]</strong></td>
<td>30</td>
</tr>
<tr>
<td>Recurrent event</td>
<td>6.3</td>
</tr>
<tr>
<td>Patient non compliance</td>
<td>25.3</td>
</tr>
<tr>
<td>Others</td>
<td>68.4</td>
</tr>
</tbody>
</table>

[Visit www.escardio.org/EACPR](http://www.escardio.org/EACPR)
**EuroCaReD**

1st snapshot: drop-out indicators and events

<table>
<thead>
<tr>
<th>Indicators for drop-out</th>
<th>Initiating event for drop-out</th>
</tr>
</thead>
<tbody>
<tr>
<td>High blood pressure</td>
<td>p &lt; 0.01</td>
</tr>
<tr>
<td>High Hb</td>
<td>p &lt; 0.05</td>
</tr>
<tr>
<td>Lower Max’s achieved</td>
<td>Non CV death</td>
</tr>
<tr>
<td>Renal failure</td>
<td>CV death</td>
</tr>
<tr>
<td>History</td>
<td></td>
</tr>
</tbody>
</table>

- **There is need to reduce drop-outs, particularly in most fragile patients**
- **PCI should not be plausible reason**
- **The majority of unknown causes needs further investigation**
Barriers

- **Patient-related barriers**, i.e. patient refusal, depression, social isolation, limited finances and lack of transportation

- **System-related barriers**, i.e. related to the healthcare system and/or social barriers (e.g. lack of a CR programme, lack of insurance coverage, poor transport infrastructure)
Posttraumatic stress disorder in first-time myocardial infarction patients

Susanne Schmidt Pedersen, PhD, Berrie Middel, PhD, and Mogens Lytken Larsen, MD, Tilburg and Groningen, The Netherlands, and Aarhus, Denmark

OBJECTIVES: The objectives of this study were to investigate the prevalence of posttraumatic stress disorder in patients with a first myocardial infarction compared with a random sample of healthy controls and to determine variables associated with the disorder.

DESIGN: A questionnaire was distributed to 112 consecutive patients 4 to 6 weeks after infarction and to 115 healthy controls selected randomly from the general population. Objective clinical measures were obtained from the patients' medical records.

RESULTS: Twenty-five (22%) patients qualified for a diagnosis of posttraumatic stress disorder (PTSD) compared with 8 (7%) controls with patients being more than a three-fold (OR: 3.84; 95% CI: 1.65 to 8.94) risk of having the disorder. When adjusting for other variables, the risk was reduced to above a two-fold risk (OR: 2.71; 95% CI: 0.99-7.41). In patients and controls, depression and neuroticism were associated with a diagnosis of PTSD adjusting for other variables. In patients, anxiety was associated with a diagnosis of PTSD adjusting for other variables. Left ventricular ejection fraction and symptoms of angina pectoris were not related to a diagnosis of PTSD in the patient group.

CONCLUSIONS: Given that previous research has shown that persons with PTSD are at increased risk of cardiovascular diseases, cardiac patients with the disorder may be at a higher risk of recurrent cardiac events. Although longitudinal studies are needed to confirm such a relationship, this disorder should not be overlooked because of its potential role in reinfarctions and mortality. (Heart Lung® 2003;32:300-7.)
Socially differentiated cardiac rehabilitation: Can we improve referral, attendance and adherence among patients with first myocardial infarction?

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