The natural history of premature coronary artery disease over 20 years: the AFIJI registry


Pitie-Salpetriere Hospital, Sorbonne University Paris 6 (UPMC), ACTION Study Group, INSERM UMR5_1166, Institut de Cardiologie, Paris, France

jean-philippe.collet@aphp.fr www.action-coeur.org

Abstract

Background: The long-term natural history of premature coronary artery disease (CAD), defined as ischemic heart disease before 45 year-old, is unknown.

Purpose: The primary objective was to describe the evolution of premature CAD over 20 years of follow-up and determine the risk of recurrent major adverse cardiovascular events (MACE) defined as death, MI, ischemic stroke and revascularization. The second objective was to assess the independent correlates of this primary endpoint.

Methods: The multicenter prospective AFIJI (Appraisal of risk Factors in young Ischemic Patients Justifying aggressive Intervention) registry was started in January 1996 enrolling all consecutive patients presenting with angiographically established CAD before the age 45. The last follow-up was obtained in January 2017.

Results: A total of 880 patients were enrolled and followed up on average for 9.6 years (IQR). Patients were mainly males (88%) active smokers (77%) aged 41 years (36-43) presenting with an acute MI (79%) due to single vessel CAD (60%). Family history of CAD (40%) and hypercholesterolemia (51%) were common while diabetes (11%) and systemic inflammatory disease (10%) were less frequent. The vast majority of patients (97%) underwent coronary revascularization predominantly with drug-eluting stents (51%). One out of three patients (n=263, 29.9%) presented a recurrent event (total number of MACE: 398). Myocardial infarction (n=209, 23.8%) and coronary revascularization (n=126, 14.3%) were the most frequent events predominantly related to the occurrence of new coronary atherothrombotic lesions (15.4% vs. 7.5%, p<0.001, HR=2.1, 95% CI [1.5-2.6] for new versus initial lesion, respectively) (Figure). All-cause death (n=55, 6.3%) occurred within a median time of 8.4±5 years while ischemic stroke (n=9, 0.9%) was less frequent. Independent correlates of MACE were smoking continuation, the presence of a concomitant chronic inflammatory disease, a multi-vessel CAD status and diabetes.

Table 1: Baseline characteristics

<table>
<thead>
<tr>
<th>N=880 patients</th>
<th>1st recurrence</th>
<th>Time to Event</th>
<th>2nd recurrence</th>
<th>Recurrences ≥ 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age ≥ 35</td>
<td>198 (22.5)</td>
<td>8.4</td>
<td>40 (4.5)</td>
<td>38 (4.3)</td>
<td>209 (23.8)</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>26.1 ± 4</td>
<td>28 (3.2)</td>
<td>287 (32.4)</td>
<td>127 (14.4)</td>
<td></td>
</tr>
<tr>
<td>Clinical presentation</td>
<td>693 (78.8)</td>
<td>10 (1.1%)</td>
<td>6 (0.7)</td>
<td>5.4</td>
<td>2 (0.2)</td>
</tr>
</tbody>
</table>

Ethnic background
- Caucasian: 638 (72.5)
- Sub-Saharan Africa: 46 (5.2)
- Asian: 30 (3.4)
- Northern Africa & Middle East: 166 (18.8)

Risk factors
- Familial history of CAD: 359 (40.8)
- Active smoking: 679 (77.1)
- Dyslipidemia: 443 (50.3)
- Arterial Hypertension: 178 (20.2)
- Diabetes: 94 (10.7)
- Chronic Inflammation: 87 (9.8)

Coronary Anatomy and Revascularization
- Single vessel: 529 (60.1)
- Two vessels: 179 (20.3)
- Three vessels: 172 (19.5)
- Coronary dissection: 10 (1.1)
- Sport-related plaque rupture: 11 (1.3)
- Drug eluting stent: 478 (54.4)
- Bare metal stent: 304 (34.7)
- Thromboaspiration w/o stent: 11 (1.3)
- Coronary artery bypass graft: 57 (6.5)
- Optimal medical treatment: 30 (3.4)

Conclusion: Premature coronary artery disease is an aggressive and chronic disease with a high rate of recurrences and a frequent evolution towards multivessel disease.

Table 2: major adverse cardiovascular events.

![Figure 1](image1.png)

**Figure 1:** Primary endpoint according to new lesions versus initial culprit lesion.

**Figure 2:** HR plot for multivariate Cox Model using repeated measurements for multiple recurrences.

![Figure 2](image2.png)