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Coronary Artery Disease (Chronic) / Chronic Coronary Syndromes (CCS) – Clinical

Premature coronary artery disease in all-comers undergoing first PCI

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Background: The prevalence of coronary artery disease (CAD) increases with age, yet some individuals develop obstructive CAD at younger age.

Purpose: The present analysis aimed to assess differences in baseline risk profile and 3-year adverse event risk between patients undergoing percutaneous coronary intervention (PCI) for premature or non-premature CAD.

Methods: We pooled patient-level data of four randomized PCI trials in all-comers (TWENTE (clinicaltrials.gov: NCT01066650); DUTCH PEERS (NCT01331707); BIO-RESORT (NCT01674803); and BIONYX (NCT02508714)), who had no previous coronary revascularization (by PCI or coronary artery bypass surgery) or myocardial infarction (MI). Premature CAD was defined as CAD in men <50 years and in women <55 years, while non-premature CAD was classified as CAD in older patients. Main clinical endpoint was major adverse cardiac events (MACE), a composite of all-cause mortality, any MI, emergent coronary bypass surgery, or clinically indicated target lesion revascularization.

Results: Of all 6,171 PCI patients with first revascularizations, one out of seven (n=887, 14.4%) had premature CAD. These patients had lower rates of diabetes (10.6% vs. 16.6%, p<0.001), hypertension (32.7% vs. 50.7%, p<0.001), hypercholesterolemia (35.9% vs. 40.3%, p=0.012), and peripheral arterial disease (2.0% vs. 6.6%, p<0.001). Yet, they were more often overweight (76.2% vs. 69.8%, p<0.001), smoker (60.7% vs. 26.4%, p<0.001), and had more often a family history of CAD (59.8% vs. 44.5%, p<0.001). Patients with premature CAD suffered more often from acute ST-segment elevation MI and underwent less often treatment of calcified or bifurcated lesions (Table 1).

At 3-year follow-up, the main endpoint MACE did not differ significantly between patients with premature and non-premature CAD (6.6% vs. 9.4%; adj.HR:0.86, 95%-CI:0.65-1.16, p=0.33; Figure 1). All-cause mortality was lower in patients with premature CAD (0.8% vs. 4.4%; adj.HR:0.23, 95%-CI:0.10-0.52, p<0.001). Yet, in patients with premature CAD the rate of repeated target vessel revascularization was higher than in patients with non-premature CAD (6.1% vs. 4.3%; adj.HR: 1.63, 95%-CI:1.18-2.26, p=0.003). In addition, their definite stent thrombosis risk was higher (1.0% vs. 0.5%; adj.HR:3.20, 95%-CI:1.39-7.38; p=0.006) than in patients with non-premature CAD.

Conclusions: One out of seven patients who were treated with PCI had premature CAD, and these patients had less complex risk profiles. Patients with premature CAD had higher risks for repeated revascularization and stent thrombosis, but the 3-year all-cause mortality risk was lower. In patients with premature CAD, long-term outcome after PCI might be improved by addressing modifiable risk factors such as smoking and overweight.

Table 1: Baseline and procedural characteristics

	Premature coronary artery disease		p-value
	Yes (n=887)	No (n=5,284)	
General characteristics			
Age (years)	45.7±4.7	65.7±8.8	
Women	269 (30.3 %)	1,515 (28.7 %)	0.31
Body-Mass Index (>25 kg/m²)	607/797 (76.2 %)	3,410/4,883 (69.8 %)	<0.001
Smoker	535/881 (60.7 %)	1,375/5,192 (26.4 %)	<0.001
Diabetes mellitus	94 (10.6 %)	875 (16.6 %)	<0.001
Hypertension	289 (32.7 %)	2,666 (50.7 %)	<0.001
Hypercholesterolemia	316/881 (35.9 %)	2,112/5,235 (40.3 %)	0.012
Peripheral arterial disease†	18 (2.0 %)	346 (6.6 %)	<0.001
Family history of coronary artery disease	523/875 (59.8 %)	2,294/5,153 (44.5 %)	<0.001
Clinical syndrome at presentation			<0.001
Stable angina pectoris	177 (20.0 %)	1,696 (32.1 %)	
STEMI	358 (40.4 %)	1,464 (27.7 %)	
Non-STEMI	224 (25.3 %)	1,277 (24.2 %)	
Unstable angina pectoris	128 (14.4 %)	847 (16.0 %)	
Procedural characteristics			
Multivessel treatment	117 (13.2 %)	984 (18.6 %)	<0.001
Calcified lesion treatment	91 (10.3 %)	1,070 (20.2 %)	<0.001
Bifurcated lesion treatment ‡	263 (29.7 %)	1,841 (34.8 %)	0.003

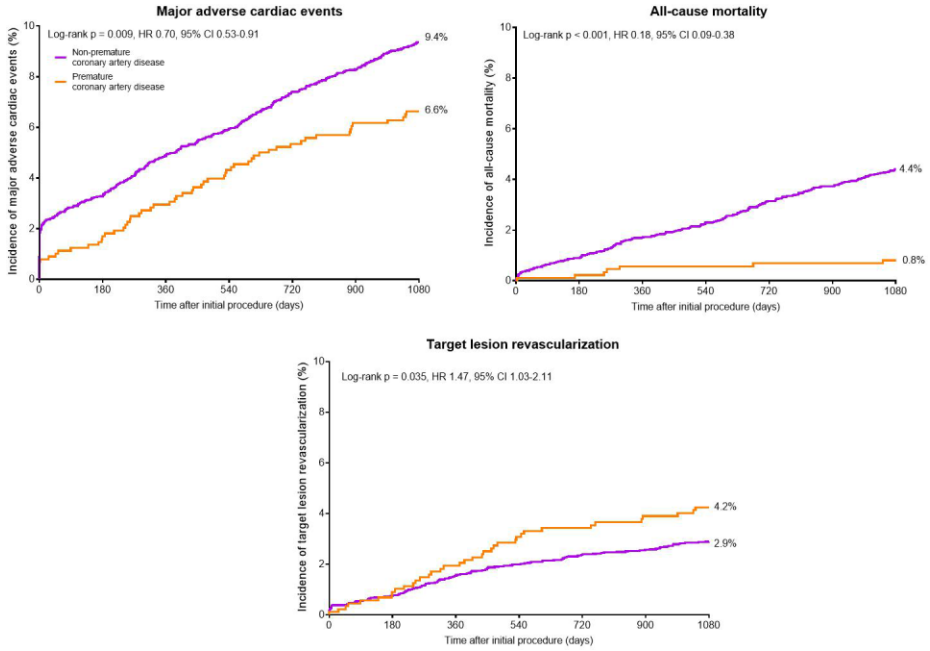

Figure 1: Kaplan-Meier cumulative event