

Urgence femmes : Prise en charge et traitements du SCA

*Quelles solutions pour changer le
pronostic ?*

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APPAC

ACTUALISATIONS ET PERSPECTIVES
EN PATHOLOGIE CARDIOVASCULAIRE

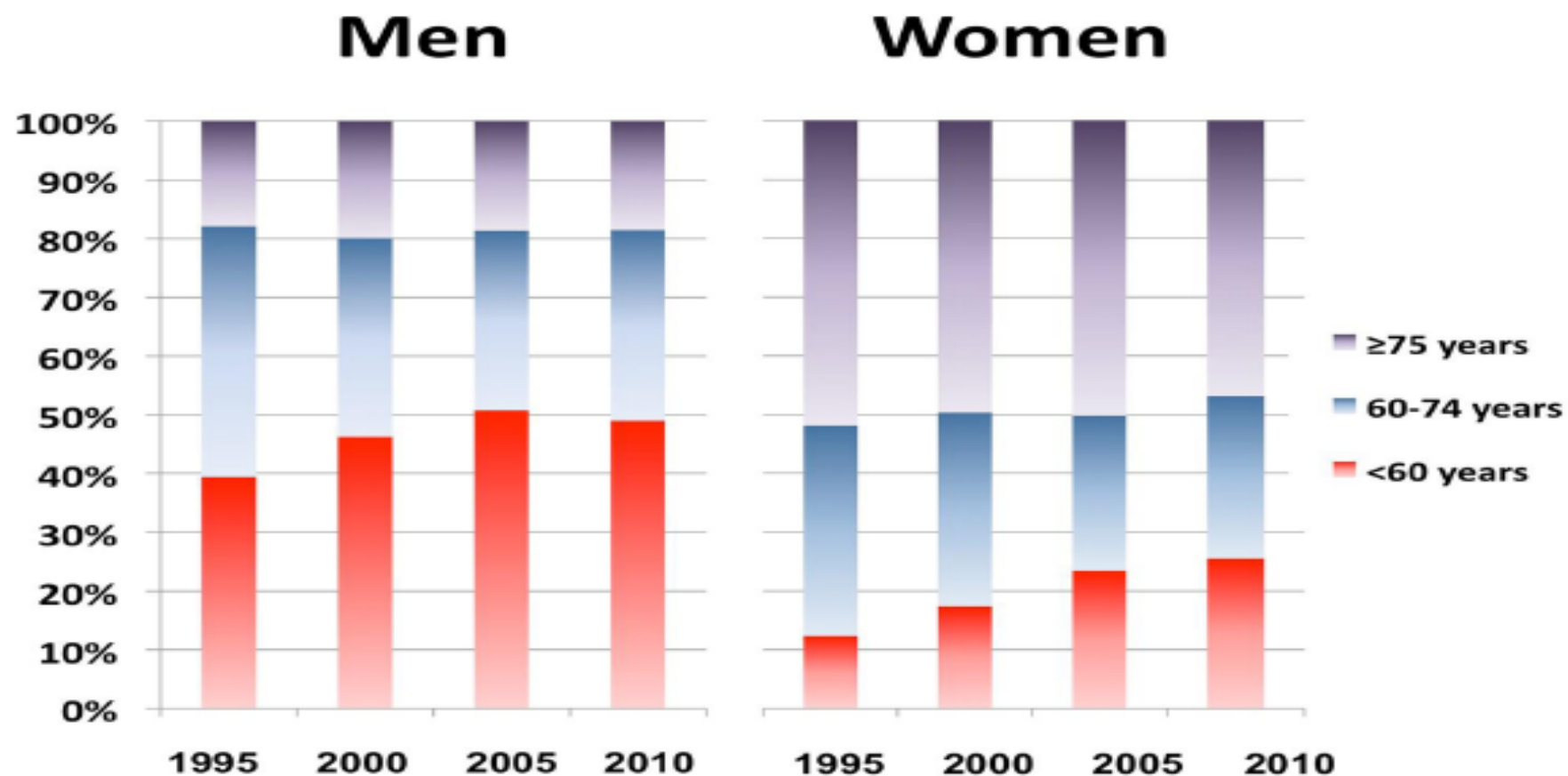


Research grants and fees for giving lectures and/or consulting :
Lilly, Daichi Sankyo, Abiomed, Saint Jude Medical, Biotronik,
Servier, Astra-Zeneca, Correvio

Population à risque

- 1^{ere} cause de mortalité
- 2003 Europe: cout globale pathologie coronaire 45 billion euro *Leal J Eur Heart J 2006*
- 1 million d'année de travail perdue due à la mortalité Coronarienne
- « Sudden cardiac death » chez la femme ménopausée 2.4/10 000/an, 50% coronaropathie non diagnostiquée *Bertoia et al. JACC 2012*

FAST MI, ESC 2012



Facteurs de risque/ comorbidités

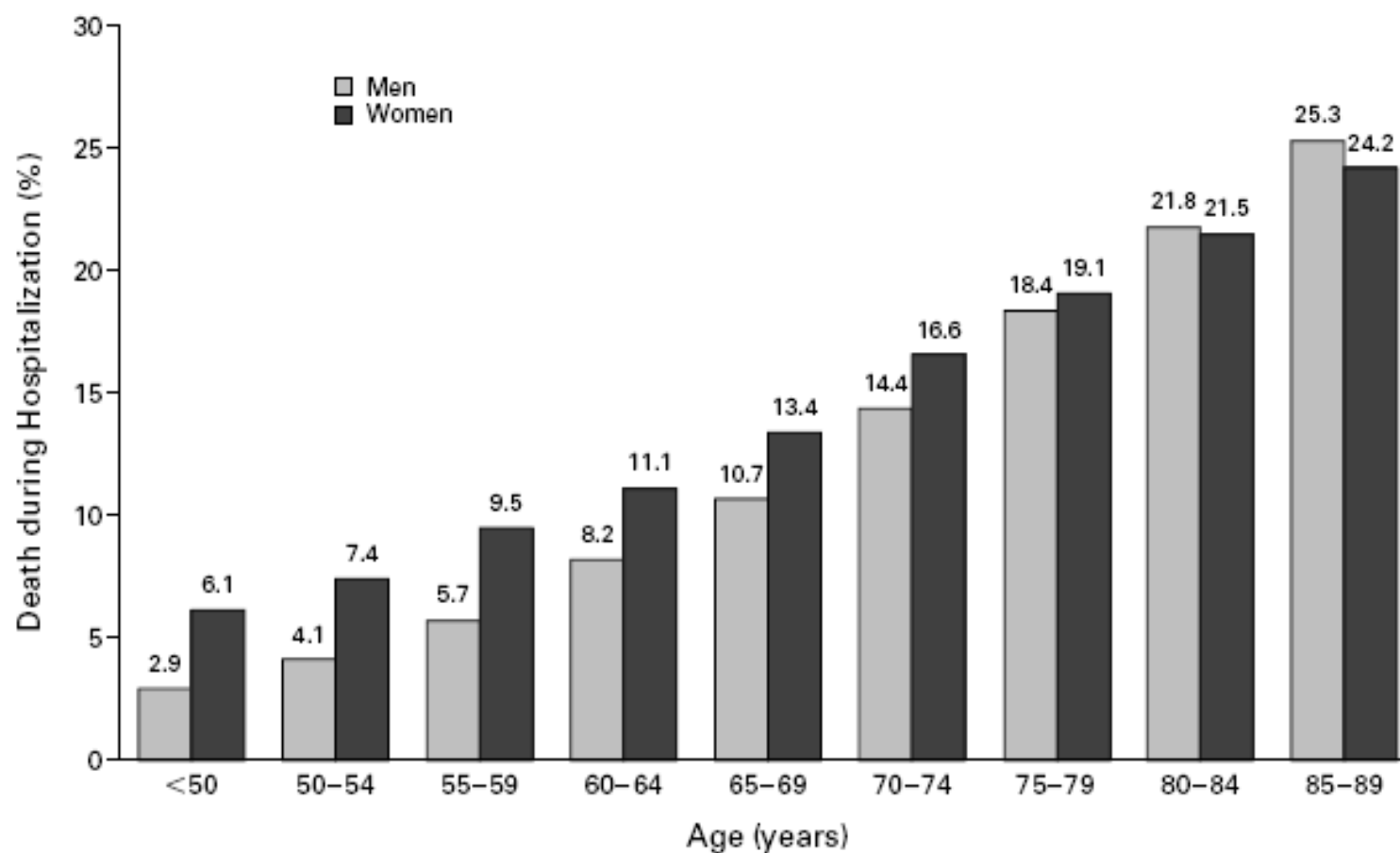
Variable	Women		Men		p Value	
Patients (n)			All (n=7385)	Male (n=5405)	Female (n=1980)	p-value
ST-segment elevation myocardial infarction						<0.0001
Non-ST-segment elevation myocardial infarction						0.0008
Age			63.7	62.3	67.4	<0.00001
Variable	Men (n = 2,615)	Women (n = 868)			p Value	
Age (yrs)	61.8 ± 11.9	67.6 ± 13.1			<0.001	
Body mass index (kg/m ²)	26.6 ± 3.7	26.3 ± 4.8			0.110	
Risk factors						
Non-insulin-dependent diabetes mellitus	214 (8.3%)	80 (9.3%)			0.346	
Insulin-dependent diabetes mellitus	50 (1.9%)	42 (4.9%)			<0.001	
Hypertension*	841 (32.5%)	394 (45.9%)			<0.001	
Hypercholesterolemia†	608 (23.6%)	187 (21.8%)			0.282	
Family history of cardiovascular disease‡	994 (40.2%)	335 (41.2%)			0.646	
Current smoking	1,222 (47.8%)	344 (40.6%)			0.001	
Number of risk factors	1.52 ± 1.05	1.60 ± 1.10			0.036	
Previous myocardial infarction	314 (12.1%)	61 (7.1%)			<0.001	
Previous PCI	238 (9.2%)	52 (6.0%)			0.004	
Previous coronary artery bypass grafting	76 (2.9%)	9 (1.0%)			0.002	
Previous peripheral vascular disease	136 (5.3%)	28 (3.3%)			0.016	
Previous cerebrovascular disease	157 (6.1%)	59 (6.9%)			0.418	
Previous malignancy	142 (5.5%)	68 (8.0%)			0.011	
Previous renal insufficiency§	86 (3.3%)	41 (4.8%)			0.053	
Anemia on admission, moderate to severe	41 (1.6%)	14 (1.6%)			0.911	
Out-of-hospital cardiac arrest	176 (6.7%)	48 (5.5%)			0.212	
Cardiogenic shock	162 (6.2%)	65 (7.5%)			0.181	

Champney et al 2009; Hvelplund et al 2010; Schiele et al, 2011; Jakobsen et al, 2012; Velders MA et al, 2013

Facteurs de risque

- Traditionnels:
 - Plus d'hypercholestérolémie > 50 ans
 - Diminution HDL après la ménopause
 - Hypertriglyceridémie
 - Diabète pronostic plus sombre
- Nouveaux:
 - CRP taux > dès la puberté (*Wong Prev Cardiol 2001*)
 - hsCRP (*Ridker NEJM 2002*)
 - Autres marqueurs d'inflammation serum amyloid A (*Johnson Circ 2004*)
 - Déficit en œstrogène (*Bairey Merz CN. JACC 2003*)
 - Résistance à l'insuline
 - Obésité androïde

Pronostic



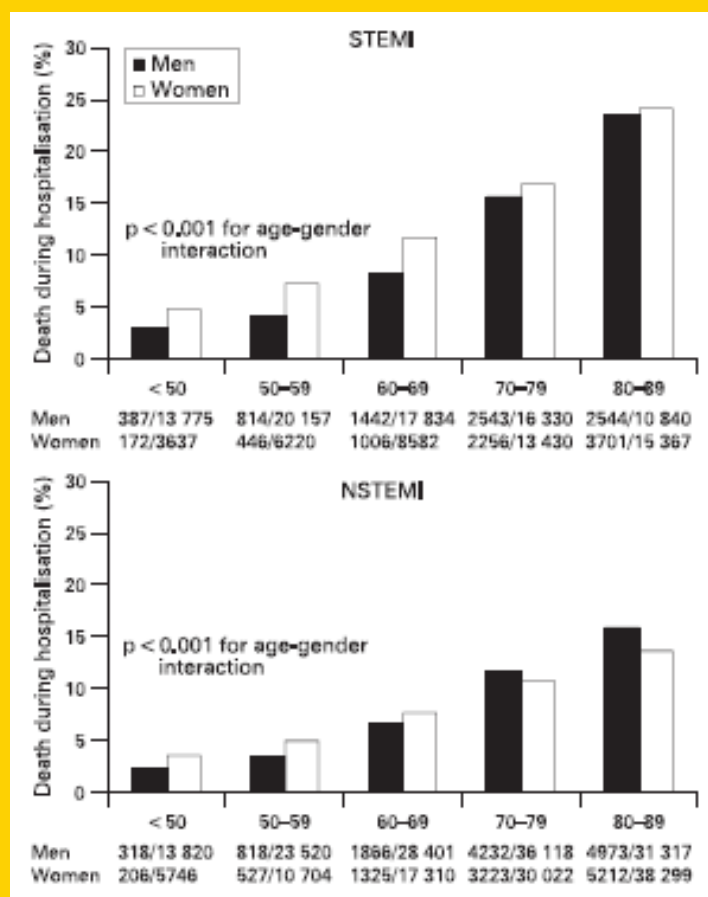
Vaccarino et al, NEJM 1999

Pronostic

		OR	[IC]	p
Female gender	Women vs Men	1.38	[1.16-1.63]	0.0002
Age	<55	1	-	<0.0001
	[55-65]	1.64	[1.24-2.16]	
	[65-75]	2.88	[2.21-3.75]	
	≥75	6.49	[5.08-8.30]	
Diabetes mellitus	Yes vs. No	1.36	[1.13-1.63]	0.001
Cardiogenic shock	Yes vs. No	20.67	[17.23-24.80]	<0.0001
Left main	Yes vs. No	2.06	[1.56-2.71]	<0.0001
CAD >50%	One vessel disease vs. <50%	0.64	[0.39-1.03]	0.002
	Two vessel disease vs. <50%	0.80	[0.50-1.28]	
	Three vessel disease vs. <50%	0.93	[0.58-1.49]	

CARDIO-ARHIF Registry, H Benamer,
 EuroIntervention 2011;6:1073-1079

Pronostic



Champney et al 2009

Pronostic

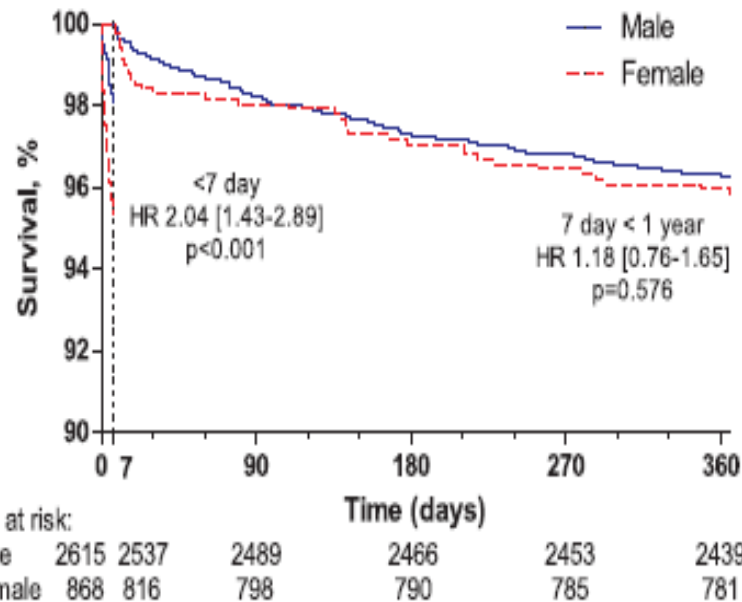
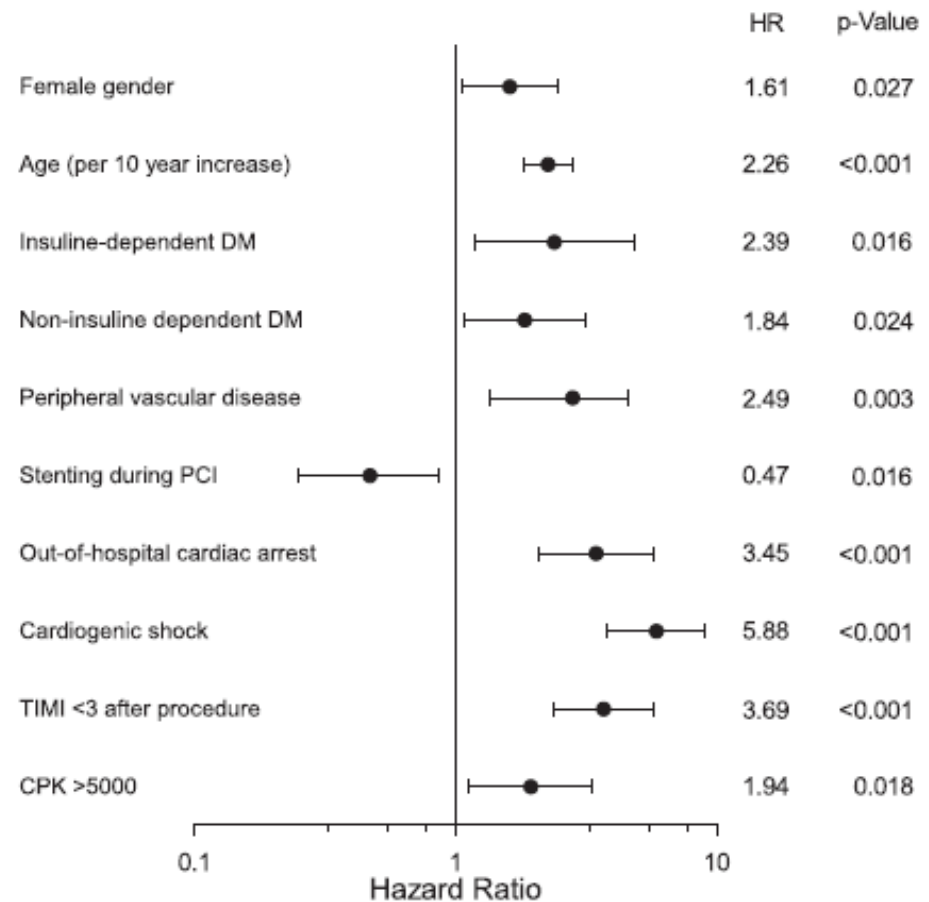
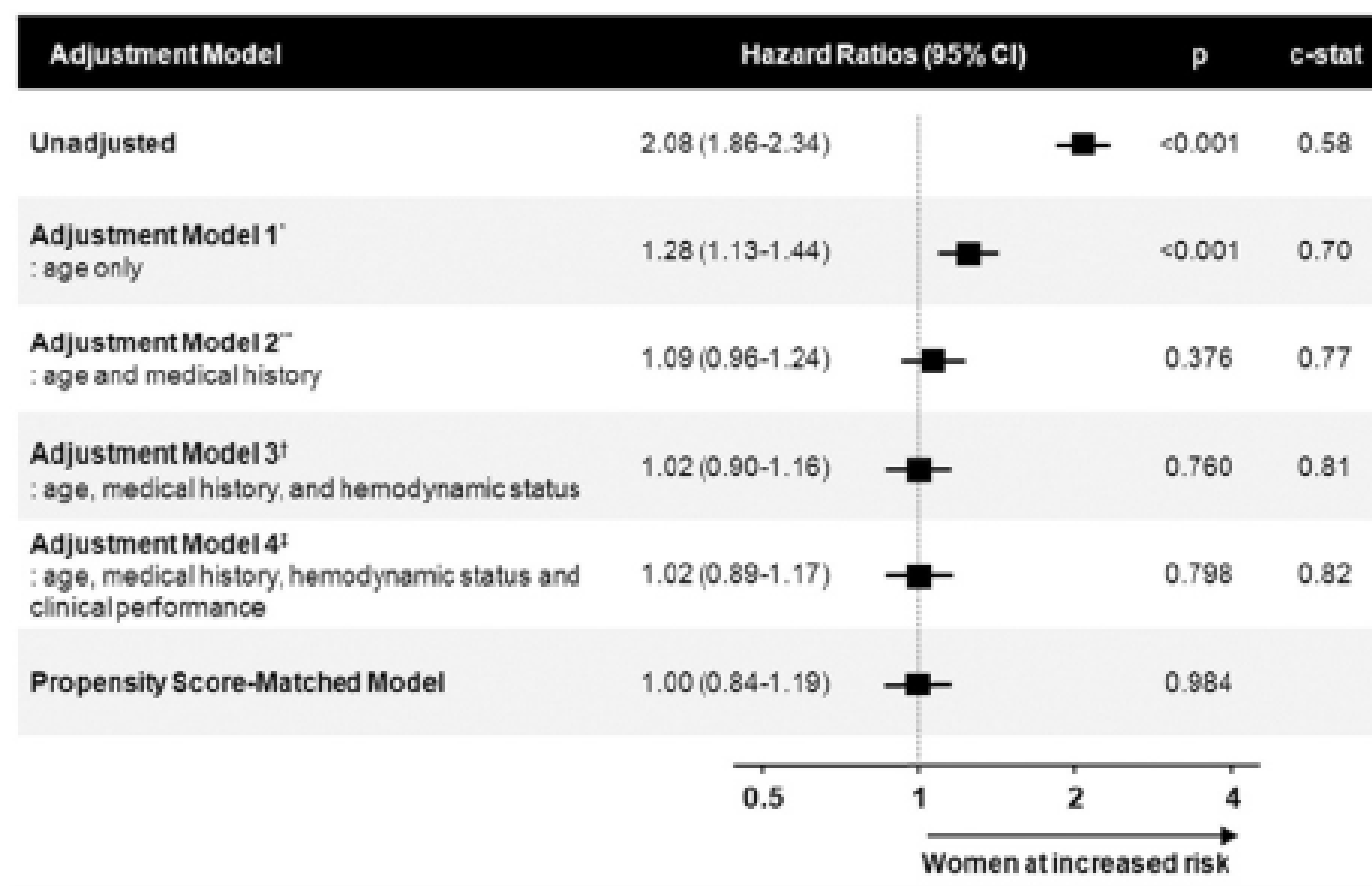


Figure 1. Landmark analysis of 1-year survival with 7-day cut-off.

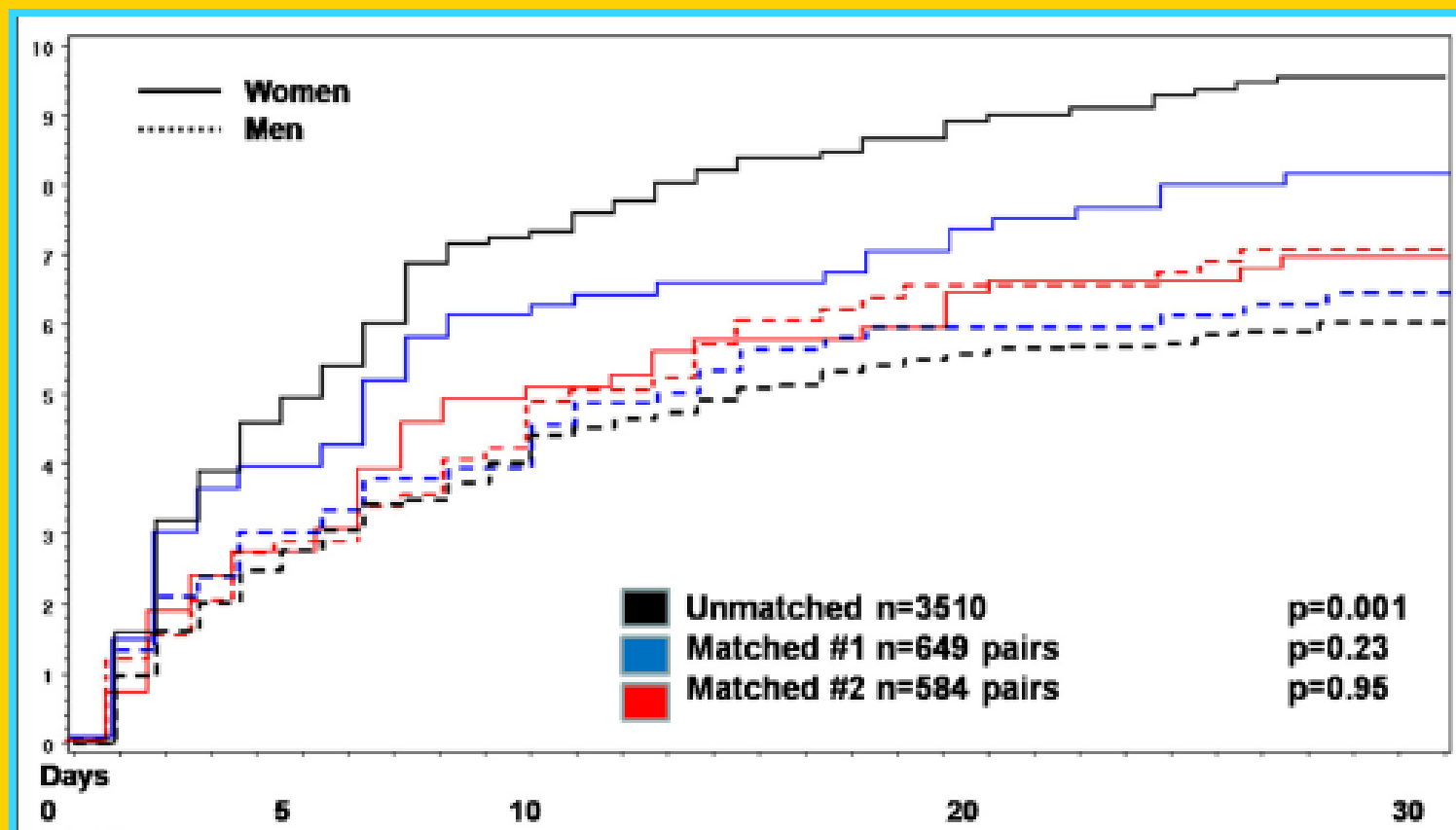


Sex Differences in Management and Mortality of Patients With ST-Elevation Myocardial Infarction (from the Korean Acute Myocardial Infarction National Registry)

Si-Hyuck Kang, MD^{a,b}, Jung-Won Suh, MD, PhD^{a,b}, Chang-Hwan Yoon, MD, PhD^{a,b}, Myeong Chan Cho, MD, PhD^c, Young Jo Kim, MD, PhD^d, Shung Chull Chae, MD, PhD^e, Jung Han Yoon, MD, PhD^f, Hyeon-Cheol Gwon, MD, PhD^g, Kyoo-Rok Han, MD, PhD^h, Joo Han Kim, MD, PhDⁱ, Young-Keun Ahn, MD, PhDⁱ, Myung-Ho Jeong, MD, PhDⁱ, Hyo-Soo Kim, MD, PhD^b, and Dong-Ju Choi, MD, PhD^{a,b,*}, on behalf of the KAMIR/KorMI Registry



Propensity Score-Matched Analysis of Effects of Clinical Characteristics and Treatment on Gender Difference in Outcomes After Acute Myocardial Infarction

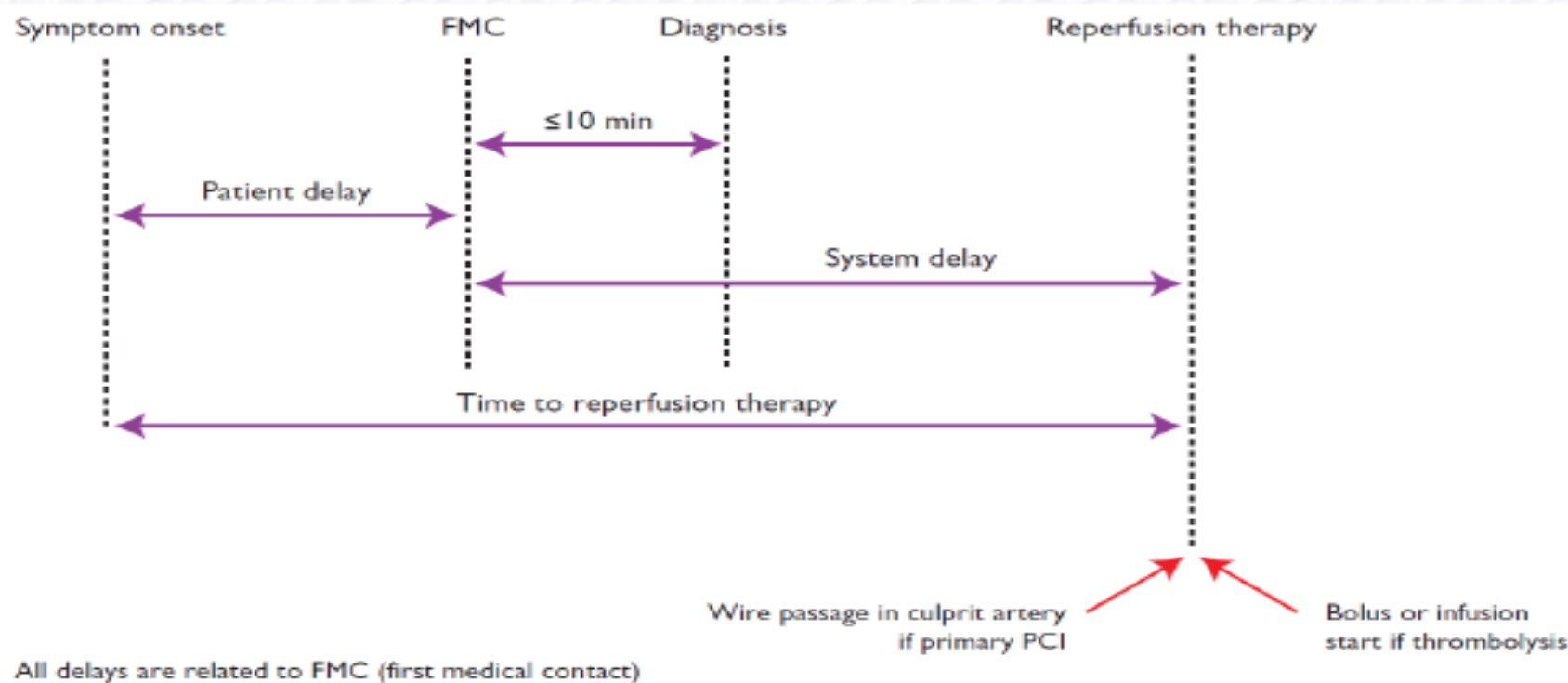


Multivariate analysis for events at two-year follow-up

	HR (95% CI)	p Value
Univariate model		
Women vs men	1.05 (0.72–1.52)	0.80
Multivariate model		
Women vs men	0.921 (0.63–1.35)	0.67
Age (per year)	1.031 (1.01–1.05)	0.0002
Diabetes mellitus	1.540 (1.11–2.213)	0.009
Hypertension	1.296 (0.87–1.93)	0.19
2- vs 1-vessel disease	1.110 (0.76–1.62)	0.59
3- vs 1-vessel disease	1.801 (1.22–2.85)	0.003

CI = confidence interval; HR = hazard ratio.

Components of delay in STEMI and ideal time intervals for intervention



Délais

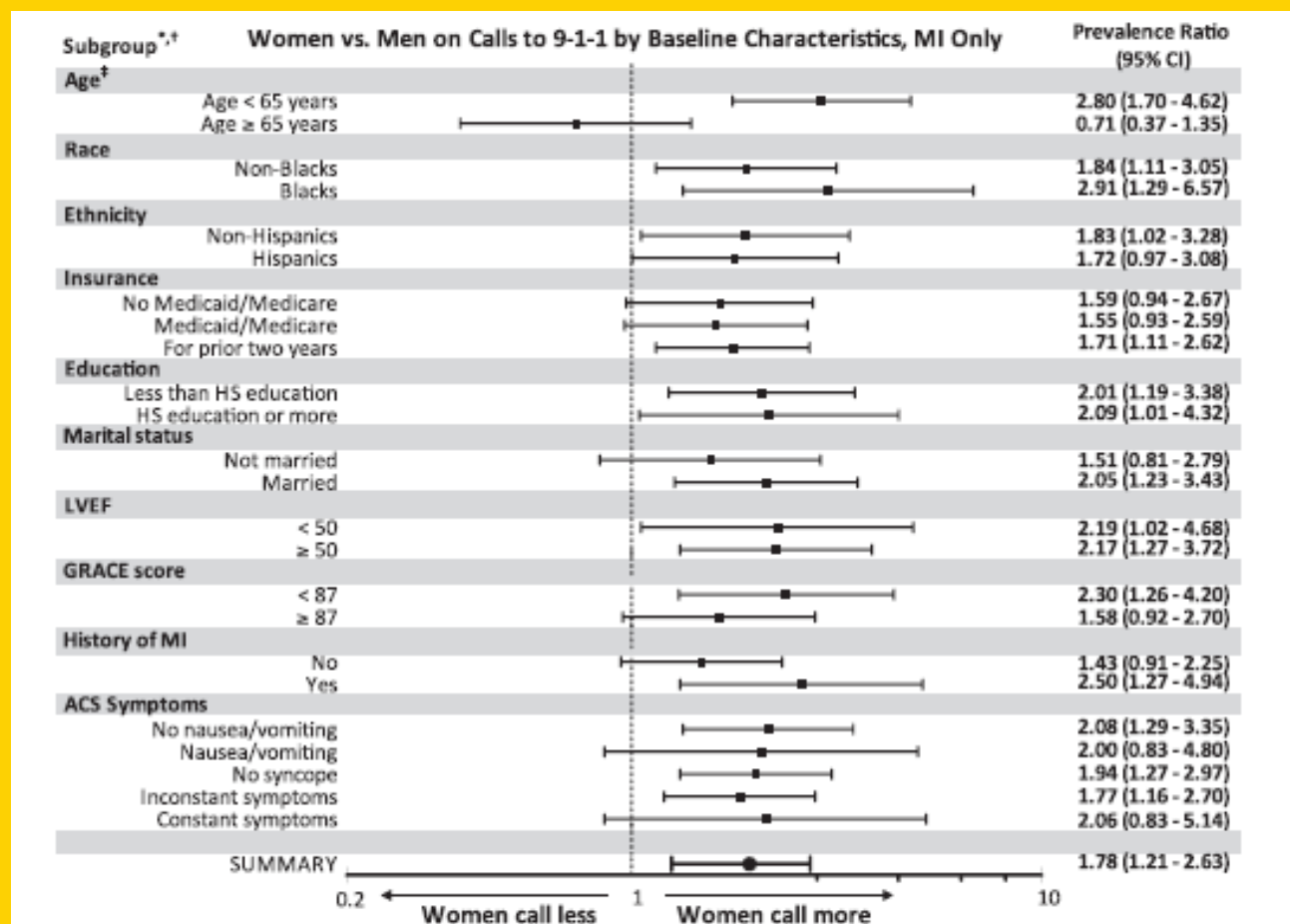
Variable	Men (n = 2,615)	Women (n = 868)	p Value
Age (yrs)	61.8 ± 11.9	67.6 ± 13.1	<0.001
Symptom-to-balloon time (minutes)	175 (128–279)	192 (141–286)	0.002
Diagnosis-to-balloon time (minutes)	78 (64–99)	81 (66–101)	0.037
Door-to-balloon time (minutes)	46 (33–67)	46 (33–68)	0.405

Velders MA et Al. Am J Cardiol 2013

	Hommes 8708 (22)	Femmes 2439 (78)	p
Age (années)	58.1 [50.1 - 69.2]	73.8 [60.1 - 81.8]	<.0001
Délai Symptômes-Appel SAMU (heures)	1.0 [0.4 - 2.6]	1.4 [0.5 - 3.8]	<.0001
Délai Appel SAMU-Arrivée SMUR (minutes)	19 [14 - 26]	20 [14 - 29]	0.0040
Pas de stratégie de reperfusion en pré-hospitalier (%)	555 (6.4)	324 (13.3)	<.0001
Mortalité hospitalière (%)	373 (4.4)	231 (10.0)	<.0001

Benamer H, SFMU 2012

Appel "15"



Prescription Use, Lifestyle, Stress Evaluation (PULSE) study at Columbia University Medical Center

Newman et al, AJC, 2013

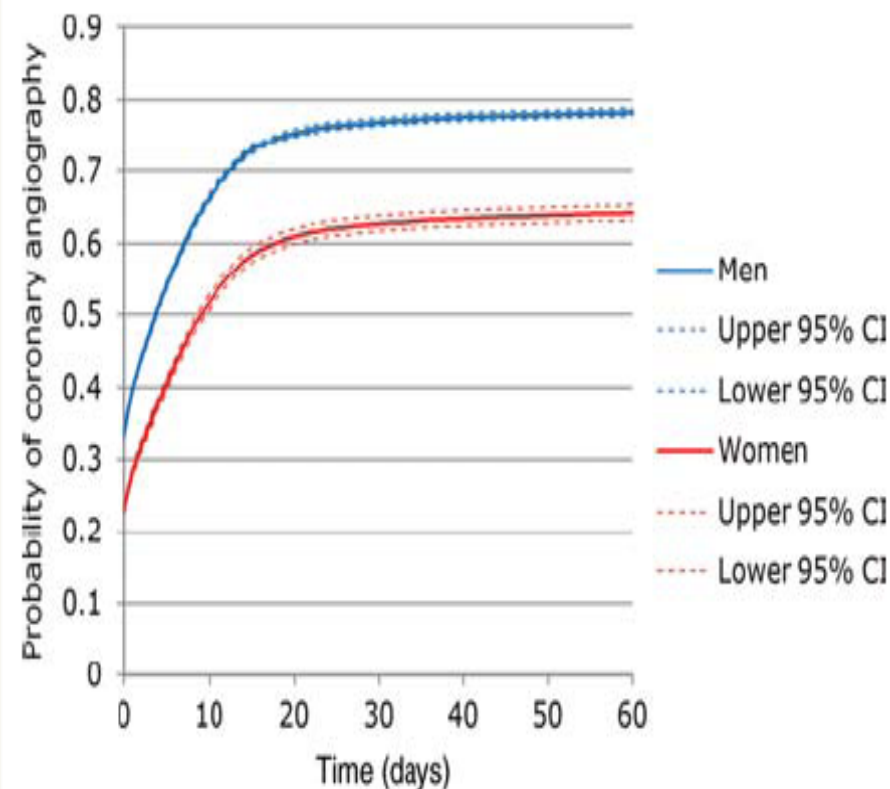
Explorations

Table 2. Rates of Coronary Angiography and Male-to-Female Relative Risks after Stratification for Potential Confounding Variables.*

VARIABLE	MASSACHUSETTS			MARYLAND		
	RATE IN MEN	RATE IN WOMEN	RELATIVE RISK (95% CONFIDENCE INTERVAL)	RATE IN MEN	RATE IN WOMEN	RELATIVE RISK (95% CONFIDENCE INTERVAL)
Principal diagnosis						
Myocardial infarction	17.2	9.3	1.85 (1.68–2.04)	16.6	9.8	1.69 (1.50–1.92)
Unstable angina	20.2	11.4	1.77 (1.63–1.93)	14.4	8.7	1.67 (1.48–1.87)
Angina pectoris	24.1	11.4	2.12 (1.88–2.39)	21.1	14.7	1.43 (1.24–1.66)
Chronic ischemia	62.0	60.5	1.03 (0.99–1.07)	63.3	57.3	1.11 (1.06–1.15)
Chest pain	8.4	11.0	0.76 (0.67–0.86)	10.5	15.7	0.66 (0.58–0.76)
Age (yr)						
30–49	29.2	21.5	1.36 (1.24–1.49)	27.8	20.6	1.35 (1.22–1.50)
50–69	31.9	21.8	1.46 (1.40–1.53)	33.5	23.8	1.41 (1.34–1.48)
70–89	17.0	9.6	1.77 (1.63–1.91)	17.8	9.5	1.89 (1.70–2.09)
Congestive heart failure						
Yes	15.6	9.0	1.73 (1.51–1.98)	13.3	8.6	1.55 (1.29–1.86)
No	29.0	17.4	1.67 (1.60–1.73)	30.4	19.2	1.58 (1.52–1.65)
Diabetes mellitus						
Yes	23.1	14.9	1.55 (1.42–1.70)	25.3	15.4	1.64 (1.47–1.83)
No	28.3	16.4	1.72 (1.65–1.79)	29.2	18.3	1.60 (1.53–1.67)
Race						
White	28.1	16.4	1.71 (1.65–1.78)	29.9	18.5	1.62 (1.55–1.69)
Nonwhite	19.7	12.9	1.52 (1.31–1.77)	21.8	14.8	1.47 (1.32–1.64)
Insurance status						
Insured	27.8	16.2	1.72 (1.66–1.79)	29.2	17.8	1.65 (1.58–1.72)
Uninsured	17.8	14.6	1.22 (0.96–1.55)	16.8	16.1	1.05 (0.81–1.36)

*Rates shown are the numbers of procedures per 100 admissions.

taux de coronarographie



HR: 0.84 , 95% CI [0.81-0.87], p<0.0001

European Heart Journal (2010) 31, 684–690

Reperfusion

Women with acute coronary syndrome are less invasively examined and subsequently less treated than men

- Moins de revascularisation

(Aklfredsson, Heart 2007; Lansky Circ 2005)

- Risque complication locale

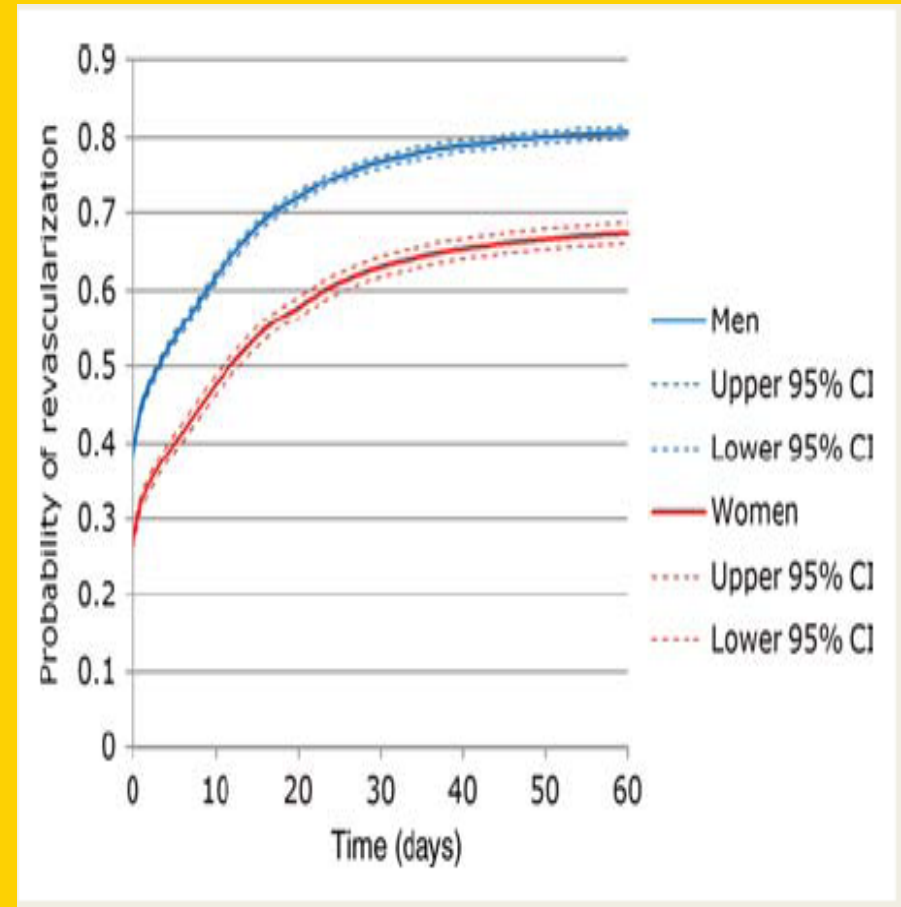
Applegate et al J Inv Card 2007

- Un bénéfice controversé:

➤ Frisc 2 (1999) , RITA 3 (2002), OASIS 5 (2009):

↑IDM et Décès bras stratégie invasive

➤ TACTICS-TIMI 18 (2004), méta analyse (JAMA 2008): ↑ pronostic surtout si haut risque



HR: 0.92 , 95% CI [0.88-0.96], p<0.0001

Angiographic findings

Variable	Men	Women	p Value
Arterial access site			
Femoral access	724 (58.0%)	247 (66.8%)	0.0025
Radial access	518 (41.9%)	122 (33.0%)	0.0036
Number of narrowed coronary arteries, mean $\pm$ SD	1.78 $\pm$ 0.76	1.64 $\pm$ 0.73	0.0014
1	542 (42.8%)	192 (51.8%)	0.0025
2	462 (36.7%)	122 (32.9%)	0.20
≥ 3	260 (20.5%)	57 (15.4%)	0.03
Number of treated vessels	1,253	363	
Mean $\pm$ SD	1.27 $\pm$ 0.32	1.21 $\pm$ 0.44	0.06
Number of coronary arteries treated			
1	956 (75.4%)	293 (78.8%)	0.19
2	255 (20.1%)	65 (17.5%)	0.39
≥ 3	42 (3.3%)	5 (1.3%)	0.051
Target vessel			
Right coronary artery	535 (28.1%)	167 (32.9%)	0.04
Left anterior descending coronary artery	783 (41.2%)	215 (42.4%)	0.61
Left circumflex coronary artery	515 (27.1%)	160 (20.9%)	0.0051
Left main coronary artery	26 (1.4%)	5 (1.0%)	0.66
Saphenous vein graft	43 (2.3%)	14 (2.8%)	0.51
Lesion characteristics			
Oral lesion	170 (10.5%)	46 (10.1%)	0.86
Aorto-ostial lesion	46 (3.2%)	19 (4.7%)	0.17
Eccentricity	1,316 (81.4%)	362 (79.4%)	0.34
Lesion angulation	148 (9.2%)	43 (9.4%)	0.85
Bifurcation	352 (21.8%)	57 (12.5%)	<0.0001
Lesion ulceration	165 (10.2%)	37 (8.2%)	0.21
Lesion occlusion	182 (11.5%)	54 (12.0%)	0.74
Moderate to severe tortuosity	123 (7.6%)	37 (8.1%)	0.69
Moderate to severe calcification	404 (25.0%)	128 (28.1%)	0.18
(Possible) thrombus in lesion	244 (15.1%)	69 (15.1%)	1
Lesion type			
A	45 (2.8%)	23 (5.1%)	0.02
B1	381 (23.6%)	121 (26.6%)	0.19
B2	678 (41.9%)	176 (38.7%)	0.22
C	513 (31.7%)	134 (29.5%)	0.36

Anatomie

	Men	Women	p Value
Baseline			
Reference vessel diameter	2.62 $\pm$ 0.58	2.57 $\pm$ 0.52	0.27
Minimal lumen diameter (mm)	0.79 $\pm$ 0.48	0.76 $\pm$ 0.49	0.11
Diameter stenosis	69.7 $\pm$ 17.1	70.6 $\pm$ 17.5	0.19
Lesion length	15.87 $\pm$ 9.08	15.34 $\pm$ 9.25	0.14
After percutaneous coronary intervention			
Reference vessel diameter	2.89 $\pm$ 0.51	2.83 $\pm$ 0.48	0.66
Minimal lumen diameter (mm)	2.51 $\pm$ 0.48	2.47 $\pm$ 0.46	0.84
Diameter stenosis	13.29 $\pm$ 7.19	12.73 $\pm$ 7.67	0.47
Quantitative coronary angiographic gain	1.72 $\pm$ 0.59	1.70 $\pm$ 0.59	0.82

Angioplastie

- Type de stent: Difference structurelle entre types de stents actifs:
 - Epaisseur des mailles EES (81µm) > SES (140 µm)
- Morice et al SPIRIT WOMEN Eurointervention 2012: EES vs SES
 - Moins de TVR et ST à 12 m: 0.59% vs 2.4%
 - Moins de TVR et ST à 24 m: 0.73% vs 3.6%
 - Faible épaisseur maille,
 - moins de lésion artérielle,
 - polymère générant moins de réaction d'hypersensibilité,
 - moindre dose de drogue antiproliférative

Pontages

- Sexe féminin: facteur prédictif indépendant de mortalité et de morbidité au décours de la

Patient related factors			Cardiac related factors		
Age ¹ (years)	0	0	NYHA	select	0
Gender	select	0	CCS class 4 angina ⁸	no	0
Renal impairment ² See calculator below for creatinine clearance	normal (CC >85ml/min)	0	LV function	select	0
Extracardiac arteriopathy ³	no	0	Recent MI ⁹	no	0
Poor mobility ⁴	no	0	Pulmonary hypertension ¹⁰	no	0
Previous cardiac surgery	no	0	Operation related factors		
Chronic lung disease ⁵	no	0	Urgency ¹¹	elective	0
Active endocarditis ⁶	no	0	Weight of the intervention ¹²	isolated CABG	0
Critical preoperative state ⁷	no	0	Surgery on thoracic aorta	no	0
Diabetes on insulin	no	0			
EuroSCORE II 0					
EuroSCORE II					
 Note: This is the 2011 EuroSCORE II	Calculate	Clear			

CREATE REGISTRY

Characteristic or outcome	Men	Women	p
Time from symptoms to hospital (min)	340	415	<0.0001
Angiography (%)	24	19.3	<0.0001
Any revascularization (%)	52.7	37.5	<0.0001
Thrombolysis (%)	44.9	30.9	<0.0001
Antiplatelet drugs (%)	98.3	97.6	0.003
Beta blockers (%)	60.5	59.7	0.314
ACE inhibitors/ARBs (%)	56.4	54.6	0.023
Lipid-lowering drugs (%)	53	50.6	0.004
Death at 30 d (%)	6.2	8.6	<0.0001

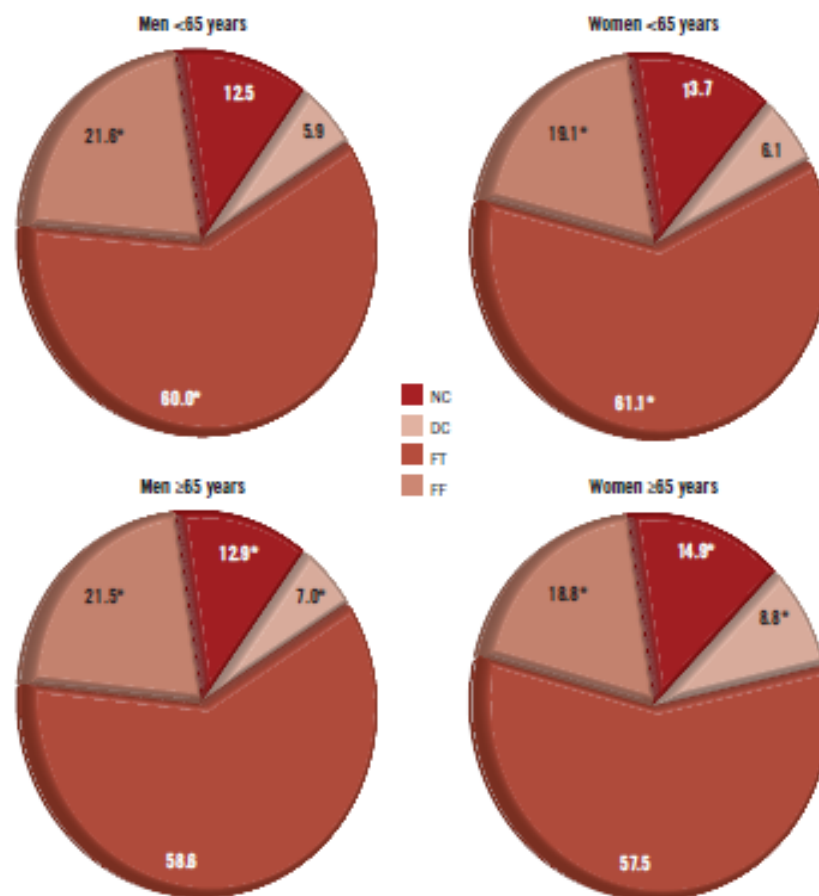
Autres différences

Physiopathologie $\neq$ des SCA selon statut hormonal Burke et al. Circ 1998

- Pré ménopause: érosion plaque, tabac++
- Post ménopause: rupture plaque, Cholestérol
- Coronaropathie non obstructive >:
 - 10-25% IDM : coro normale ou subnormale
 - remodelage, érosion, microembols WISE Bairey Merz et al. JACC 2006; Reynolds et al. Circ 2011
 - Spasme et embolie
- Formes particulières:
 - Dissections,
 - Coronarites...

Des plaques différentes?

- Core nécrotique
- Calcium dense
- Fibrose
- Fibro-lipidique



Age- and gender-related changes in plaque composition in patients with acute coronary syndrome: the PROSPECT study

Predictors of Early and Late Enrollment in Cardiac Rehabilitation, Among Those Referred, After Acute Myocardial Infarction

Susmita Parashar, John A. Spertus, Fengming Tang, Kathy L. Bishop, Viola Vaccarino, Charles F. Jackson, Thomas F. Boyden and Laurence Sperling

VA or Other insurance vs. Commercial/PPO/HMO
Medicaid vs. Commercial/PPO/HMO
No insurance vs. Commercial/PPO/HMO
PAD
Prior PCI
Hypertension
Female

Revascularization	0.81 (0.52, 1.24)
Chronic Lung Disease	0.81 (0.47, 1.39)
ENRICH Social Support Score per 5 unit increment	0.90 (0.76, 1.05)
Diabetes	0.90 (0.63, 1.30)
LV systolic function < 40	0.92 (0.64, 1.31)
Other Acute Non-Cardiac Condition	0.92 (0.26, 3.21)
Number of Eligible QOC Indicators	1.01 (0.87, 1.17)
Eligible QOC Indicators Received per 10 percentage	1.01 (0.91, 1.13)
PHQ Depression Score per 4 unit increment	1.08 (0.95, 1.23)
Age per 10 years increment	1.11 (0.95, 1.30)
BMI per 5 unit increment	1.13 (1.00, 1.27)
Working full or part time	1.15 (0.82, 1.61)
Caucasian	1.18 (0.73, 1.91)
SF PCS per 10 units increment	1.19 (1.02, 1.39)
Prior MI/CABG/PCI	1.26 (0.56, 2.84)
STEMI	1.30 (0.92, 1.82)
Family History of CAD	1.31 (0.97, 1.76)
High school	1.38 (1.04, 1.84)
Hypercholesterolemia	1.41 (1.05, 1.90)
Renal failure	1.41 (0.64, 3.12)
Married	1.46 (1.02, 2.09)
Avoid care due to cost	1.48 (0.97, 2.26)

0.36 (0.14, 0.91)
0.39 (0.08, 1.93)
0.39 (0.21, 0.71)
0.43 (0.22, 0.85)
0.55 (0.36, 0.83)
0.58 (0.43, 0.78)
0.61 (0.44, 0.86)

<<< less likely to participate

0.125 0.25 0.5 1 2 4 8
more likely to participate >>>

Des solutions?

- **Primaire:**

- Dépistage tous les facteurs de risque
- Traitement « agressif » des facteurs de risque
- Dépistage pathologie coronaire: test génétique?

PREDICT TRIAL: Lansky A. Am Heart J, 2012

- **Secondaire:**

- Sensibilisation Patients/ Médecins Urgence/ Cardio
- Exploration et Traitement invasif
- Ordonnance optimale
- Réadaptation

Ou simplement:

Recommendations for gender

Recommendations	Class ^a	Level ^b	Ref ^c
Both genders should be evaluated and treated in the same way.	I	B	246



European Heart Journal (2011) **32**, 2999–3054
doi:10.1093/eurheartj/ehr236

Table 17 Special subsets

Recommendations	Class ^a	Level ^b	Ref ^c
Both genders must be managed in a similar fashion.	I	C	-
A high index of suspicion for myocardial infarction must be maintained in women, diabetics, and elderly patients with atypical symptoms.	I	B	189



European Heart Journal (2012) **33**, 2569–2619
doi:10.1093/eurheartj/ehs215

Merci de votre attention