



Journées Pharmaceutiques Internationales de Paris

Gynéco JPIP 2022

Lundi 28 novembre 2022, Faculté de pharmacie de Paris, Université Paris Cité

Thème :

Santé de la femme : actualités 2022 – Accompagnement par le pharmacien

Santé cardiovasculaire - Cœur de femme : spécificités et conséquences

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ACTION Group**

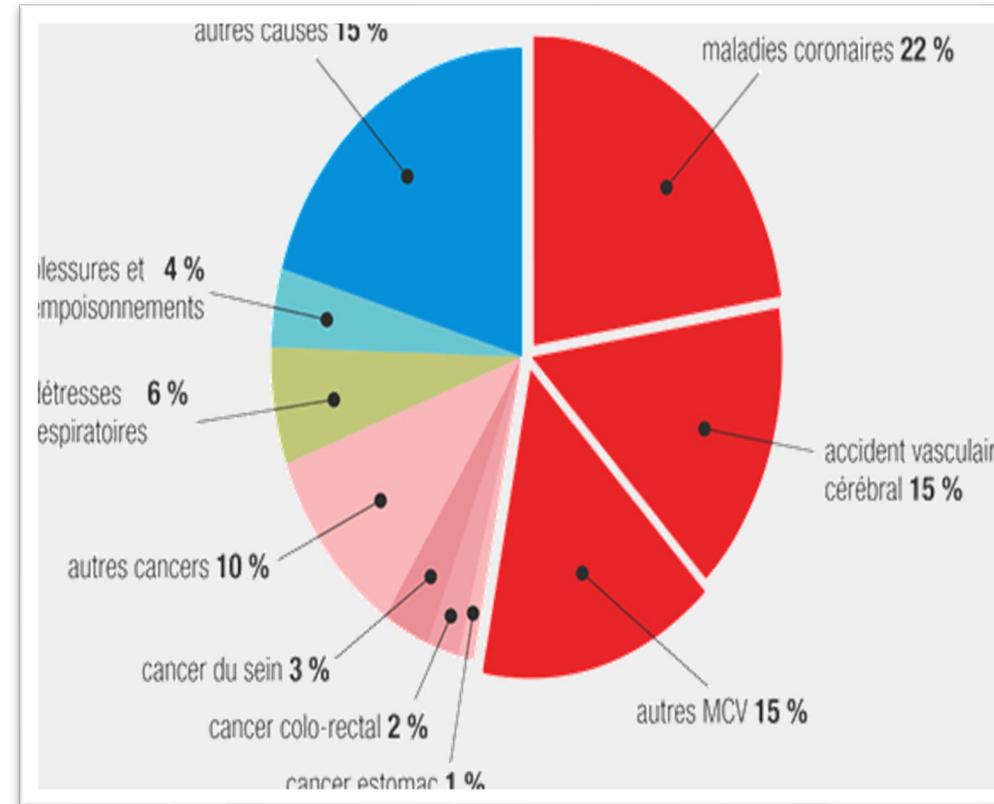
Paris, France

Déclaration d'intérêt

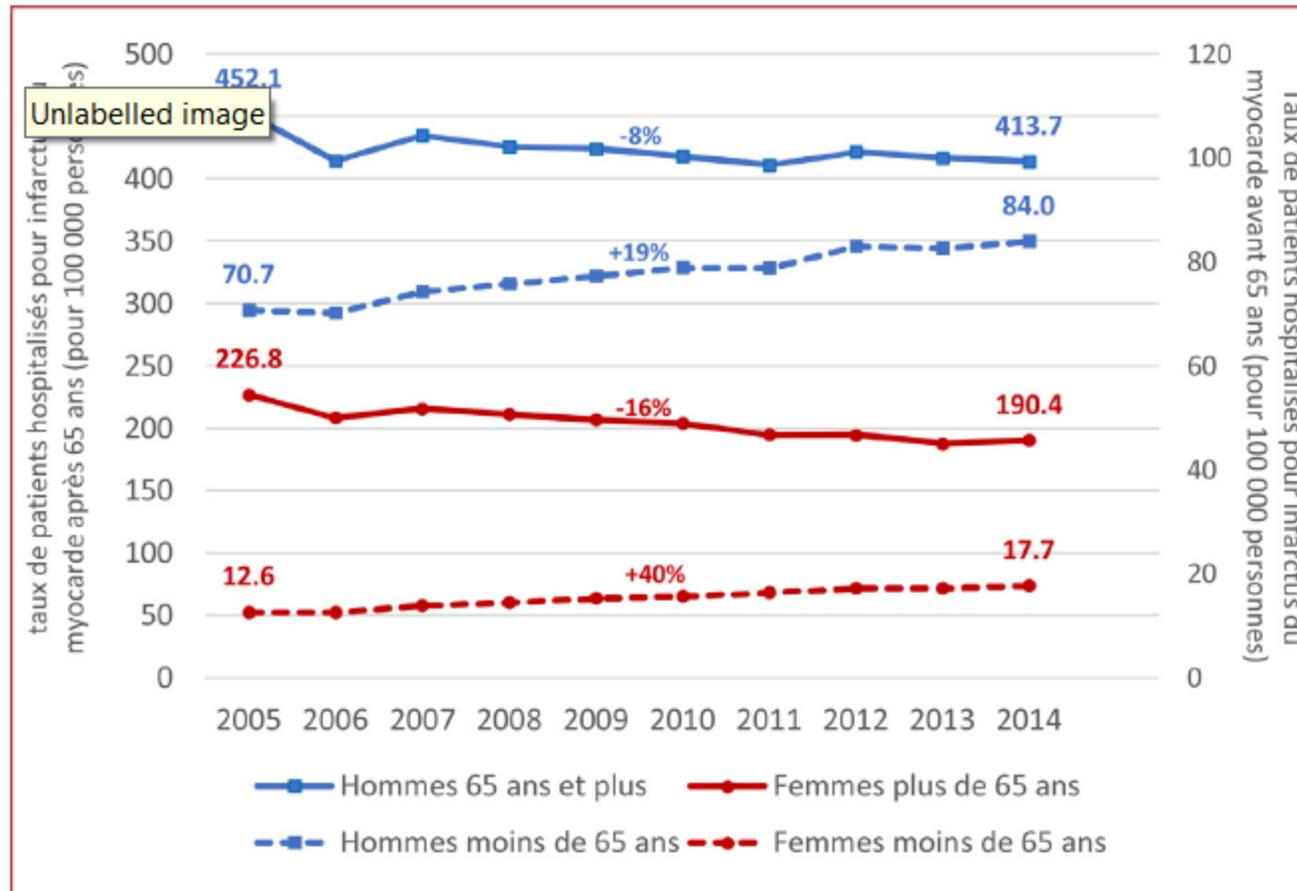
- Intervenant, Board : AstraZeneca, Biotronik, Bayer, Boehringer Ingelheim, Novo Nordisk, BMS, Organon, Exeltis, Novartis
- Bourse de recherche SFC : Abbott, AstraZeneca, Bayer, Boston Scientific France, Daiichi Sankyo, Novartis, Pfizer
- Subvention hôpital: Bayer, Novo Nordisk

Une alerte rouge, un fait de société !

- première cause de décès chez la femme :
- 50,1 % des causes de décès en Europe
- 30,1 % des causes de décès en France
- 6 fois plus que le cancer du sein sur les 147 000 décès/an en France, 54 % sont des femmes.

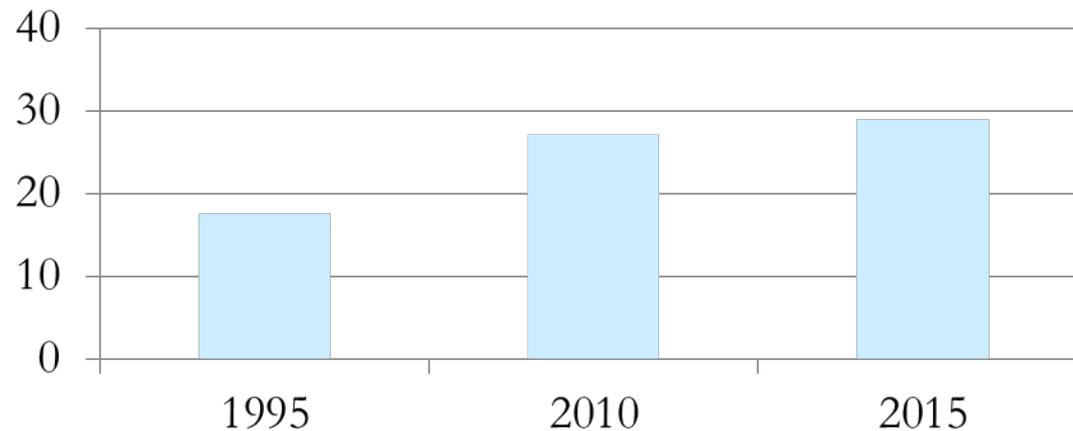


Infarctus du myocarde chez la femme : évolutions des taux d'hospitalisation et de mortalité, France, 2005-2014



FAST MI 2015

- Femmes: 25% et 30% des patients victimes d'un infarctus avec ou sans sus décalage ST.
- Diminution % femmes STEMI: de 25 à 22%, entre 2010 et 2015.
- Augmentation constante des femmes de moins de 60 ans victimes d'un STEMI:



*EVALUER LE RISQUE CARDIO-
VASCULAIRES*

Limite du FRS

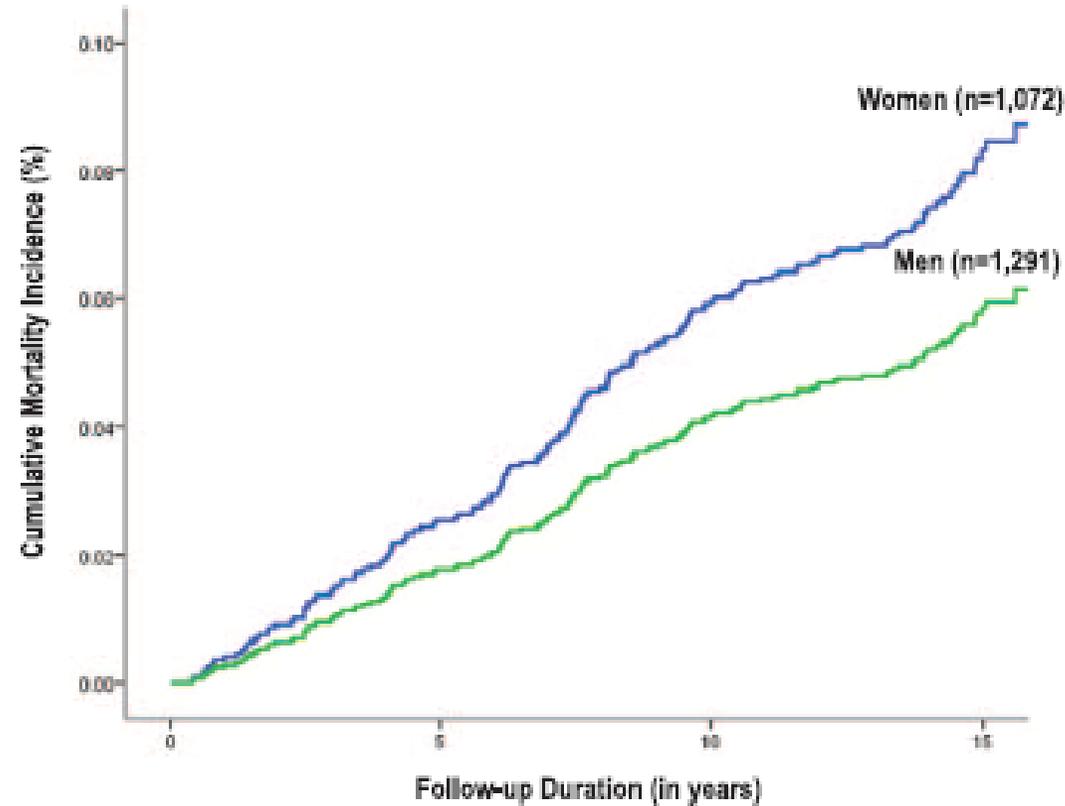


Figure 2. Cumulative all-cause mortality in women and men with low-intermediate Framingham risk scores.

Ces scores de risque ne sont pas adaptés!

- ✦ Etablis avec des cohortes où les **femmes sont sous représentées**.
- ✦ **Sous estiment le risque réel** chez la femme avec des conséquences thérapeutiques.
- ✦ **20 % des évènements coronaires** chez la femme surviennent en l'absence des facteurs de risque majeurs utilisés dans le score de Framingham.
- ✦ **Aucune femme française** n'est incluse dans la construction du score européen et la validation externe a porté sur 12 femmes décédées.
- ✦ Aucune prise en compte des **spécificités du risque hormonal**.

FACTEURS DE RISQUE CARDIO-VASCULAIRES

Facteurs de risque/comorbidités : STEMI

Table 1
Patient characteristics.

| | Men (N = 12,712) | Women (N = 4021) | Total (N = 16,733) | p Value |
|--|---------------------|---------------------|-----------------------|---------|
| <i>Registry n (%)</i> | | | | |
| FAST 2010 | 978 (76.4) | 302 (23.6) | 1280 | |
| F comt | 1344 (70.1) | 573 (29.9) | 1917 | |
| ORBI | 3122 (77.4) | 911 (22.6) | 4033 | |
| Resca31 + | 369 (75.8) | 118 (24.2) | 487 | 0.48 |
| RESCUe | 3003 (76.2) | 937 (23.8) | 3940 | |
| RESURCOR | 2983 (78.3) | 828 (21.7) | 3811 | |
| RICO | 913 (72.2) | 352 (27.8) | 1265 | |
| <i>Clinical characteristics</i> | | | | |
| Age (mean ± SD) | 60.6 ± 13.2 | 70.6 ± 14.3 | 63 ± 14.2 | <0.001 |
| Age < 50 years n (%) | 2785 (86.8) | 424 (13.2) | 3209 | |
| Age > 80 years n (%) | 1152 (46.5) | 1327 (53.5) | 2479 | |
| Type-2 diabetes ^a n (%) N = 12,764 | 1476 (15.4) | 623 (19.6) | 2099 (16.4) | <0.001 |
| HBP ^b n (%) N = 12,511 | 3651 (38.8) | 1826 (58.7) | 5477 (43.8) | <0.001 |
| Current smoker ^c n (%) N = 12,848 | 4475 (46.2) | 820 (25.9) | 5295 (41.2) | <0.001 |
| Previous CAD ^d n (%) N = 16,366 | 2466 (19.9) | 662 (16.8) | 3128 (19.1) | <0.001 |
| Previous CABG ^e n (%) N = 12,768 | 350 (3.6) | 87 (2.8) | 437 (3.4) | 0.03 |

| Variable | Overall (n=314) | STEMI | | | NSTEMI | | | p (4-way comparison) |
|---|--------------------|---------------------|--------------------------------|-------|--------------------|--------------------------------|------|--------------------------------|
| | | ≤35 years (n=25) | >35 to ≤50 years (n=166) | p | ≤35 years (n=8) | >35 to ≤50 years (n=115) | p | |
| Age minimum, years | 19 | 19 | | | 25 | | | 0.13 |
| Age, years (Mean+SD) | 42.9 (5.7) | 42.6 (6.2) | | | 43.6 (4.9) | | | |
| Cardiovascular risk factors | | | | | | | | |
| Smoker (≤3 months) | 237 (75.5) | 19 (76.0) | 129 (77.7) | 0.18 | 6 (75.0) | 84 (73.0) | 0.79 | 0.30 |
| Diabetes | 46 (14.6) | 3 (12.0) | 29 (17.5) | | 0 (0) | 14 (12.2) | 0.60 | 0.39 |
| Insulin treated | 21 (6.7) | 3 (12.0) | 15 (9) | 0.50 | 0 (0) | 3 (2.6) | | |
| Dyslipidaemia | 83 (26.4) | 3 (12.0) | 43 (25.9) | 0.13 | 2 (25.0) | 32 (27.8) | 0.86 | 0.42 |
| Hypertension | 83 (26.4) | 1 (4.0) | 49 (29.5) | 0.006 | 1 (12.5) | 32 (27.8) | 0.34 | 0.04 |
| Family history of premature cardiovascular disease* | 110 (35.0) | 11 (44.0) | 55 (33.1) | 0.29 | 4 (50.0) | 40 (34.8) | 0.39 | 0.52 |
| Obese (BMI ≥30 kg/m ²) | 88 (28.0) | 4 (16.0) | 43 (25.9) | 0.28 | 3 (37.5) | 40 (34.8) | 0.88 | 0.11 |
| Sedentary (<30 min/d) | 126 (40.1) | 8 (32.0) | 68 (41.7) | 0.36 | 2 (25.0) | 47 (41.6) | 0.47 | 0.50 |
| No SMURF | 44 (14.0) | 4 (16.0) | 21 (12.7) | 0.49 | 3 (37.5) | 16 (13.9) | 0.11 | 0.26 |

| Variable | Overall (n=314) | STEMI | | | NSTEMI | | | p (4-way comparison) |
|---|--------------------|---------------------|-----------------------------|--------|--------------------|-----------------------------|------|----------------------------|
| | | ≤35 years (n=25) | >35 to ≤50 years (n=166) | p | ≤35 years (n=8) | >35 to ≤50 years (n=115) | p | |
| Other | | | | | | | | |
| Creatine clearance <60 mL/min/1.73 m ² | 8 (2.5) | 1 (4.0) | 5 (3.0) | 0.57 | 0 | 3 (2.6) | 0.99 | 0.93 |
| Depression (patient reported) | 87 (27.7) | 6(24.0) | 52 (31.1) | 0.45 | 0 | 29 (25.4) | 0.20 | 0.15 |
| Excessive alcohol consumption† | 18 (5.7) | 1 (4.0) | 11 (6.7) | 0.99 | 0 | 6 (5.2) | 0.99 | 0.82 |
| Cannabis use | 33 (10.5) | 8 (32.0) | 13 (7.8) | <0.001 | 0 | 11 (9.6) | 0.99 | <0.001 |
| Systemic disease‡ | 9 (2.9) | 0 | 5 (3.0) | 0.99 | 0 | 4 (3.5) | 0.99 | 0.77 |
| Neoplasia | 13 (4.1) | 0 | 4 (2.4) | 0.99 | 1 (12.5) | 8 (7.0) | 0.47 | 0.11 |
| Migraine | 60 (19.1) | 3 (12.0) | 57 (34.3) | 0.025 | 6 (75.0) | 39 (34.5) | 0.02 | 0.01 |
| Gynaecological and obstetric history | | | | | | | | |
| Number of pregnancies, mean | 2.8 (2.2) | 1.8 (1.9) | 2.9 (2.5) | 0.14 | 2.7 (1.9) | 2.7 (1.8) | 0.99 | 0.15 |
| Pregnancy with complication§ | 98 (31.2) | 6 (24.0) | 59 (35.5) | 0.42 | 2 (25.0) | 31 (26.9) | 0.99 | 0.15 |
| Menopause¶ | 49 (15.6) | 0 | 30 (18.1) | 0.02 | 0 | 19 (16.5) | 0.35 | 0.07 |
| Hormonal contraception | 115 (36.6) | 15 (60.0) | 60 (36.1) | 0.15 | 3 (37.5) | 37 (32.2) | 0.99 | 0.095 |
| Assisted reproduction | 19 (6.1) | 3 (12.0) | 13 (7.8) | 0.49 | 0 | 3 (2.6) | 0.99 | |
| Recent emotional stress | 173 (55.1) | 14 (56.0) | 84 (50.6) | 0.62 | 5 (62.5) | 71 (61.7) | 0.99 | 0.26 |
| EPICES score >30 | 145 (46.2) | 8 (32%) | 76 (45.8) | 0.19 | 3 (37.5) | 55 (47.8) | 0.72 | 0.54 |

IDM et AVC femmes < 50 ans

**Comparaison âge,
facteurs de
risques AVC/SCA
entre 2009-2019**

| | SCA 2009-2019 N = 77/295 26% | AVC 2009-2019 N=218/295 74% | P value |
|---|------------------------------------|-----------------------------------|---------|
| Facteurs de risques | | | |
| Hypertension artérielle | N=29/77 (38%) | N=36/218 (17%) | < 0.001 |
| Diabète | N=10/77 (13%) | N=8/218 (3,7%) | 0.008 |
| Dyslipidémie | N=39/77 (51%) | N=15/218 (6,9%) | < 0,001 |
| Tabagisme | N=45/77 (58%) | N=75/218 (34%) | < 0,001 |
| Obésité | N=18/77 (23%) | N=19/218 (8,7%) | 0.002 |
| Surpoids | N=16/77 (21%) | N=21/218 (9,6%) | 0.019 |
| Hérédité cardiovasculaire | N=22/77 (29%) | N=19/218 (8,7%) | <0,001 |
| Nombre médian de facteurs de risques classiques modifiables [Q25-Q75] | 2 [1,3] | 1 [0, 1] | < 0,001 |
| Age médian (Q25-Q75) | 46.0 [41.0; 48.0] | 40 [34,0 ; 45.0] | <0,001 |

Courtesy of Dr Britany Kimbimbi

TABAC et femmes

UK, 2009-2014

3,343 patients

Pic STEMI femmes: 70-79 ans Pic STEMI

Homme : 50-59 ans

Tabac associé augmentation STEMI

Femmes > Hommes (IRR: **6.62**; 95% [CI]:
5.98-7.31, vs. 4.40; 95% CI: 4.15- 4.67).

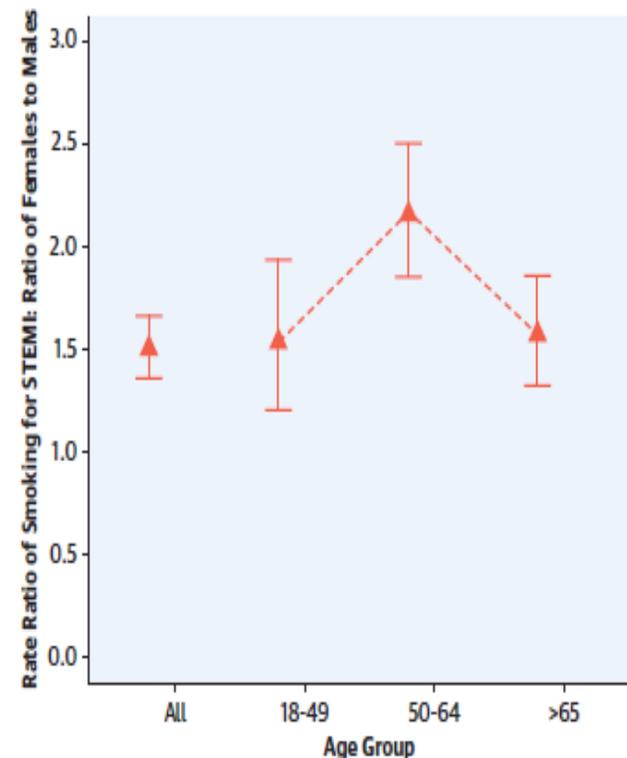
Le surrisque maximal du tabac : femmes

18-49 ans

(IRR: **13.22**; 95% CI: 10.33-16.66,

vs. 8.60; 95% CI: 7.70- 9.59)

FIGURE 4 Relative Risk of Acute STEMI in Female Smokers Compared With Male Smokers



DIABETE et femmes

Risque cardiovasculaire: **femme Diabétique x 7 vs femme non diabétique**

Homme diabétique: x3 vs homme non diabétique

Risque Coronaropathie **femme Diabétique x 3 vs femme non diabétique**

Risque Cardiopathie Ischémique : 44% plus important que les hommes diabétiques

Risque AVC ischémique : **femme Diabétique x 2,3 vs femme non diabétique**

Risque relatif AVC est de 27% plus important chez les femmes comparativement aux hommes

Risque AVC jeunes femmes diabétiques : x2 vs patientes de plus de 60 ans non diabétiques

Facteurs de risque: spécifiques

Table. Female Sex and Cardiovascular Disease Risk Factors

| Female-Specific CVD Risk Factors | Female-Predominant CVD Risk Factors |
|--------------------------------------|-------------------------------------|
| Adverse pregnancy outcomes | Autoimmune inflammatory diseases |
| Pregnancy-related hypertension | Rheumatoid arthritis |
| Gestational hypertension | Systemic lupus erythematosus |
| Preeclampsia | Scleroderma |
| Eclampsia | |
| Gestational diabetes mellitus | |
| Preterm delivery | |
| Low birth weight for gestational age | |
| Polycystic ovarian syndrome | Breast cancer |
| Functional hypothalamic amenorrhea | |
| Reproductive hormones | |
| Oral contraceptives | |
| Hormone replacement | |

CVD indicates cardiovascular disease.

Modified from Gulati.¹⁸ Copyright © 2017, American Heart Association, Inc.

2021 ESC Guidelines on cardiovascular disease prevention in clinical practice

Recommendations for cardiovascular disease assessment in specific clinical conditions

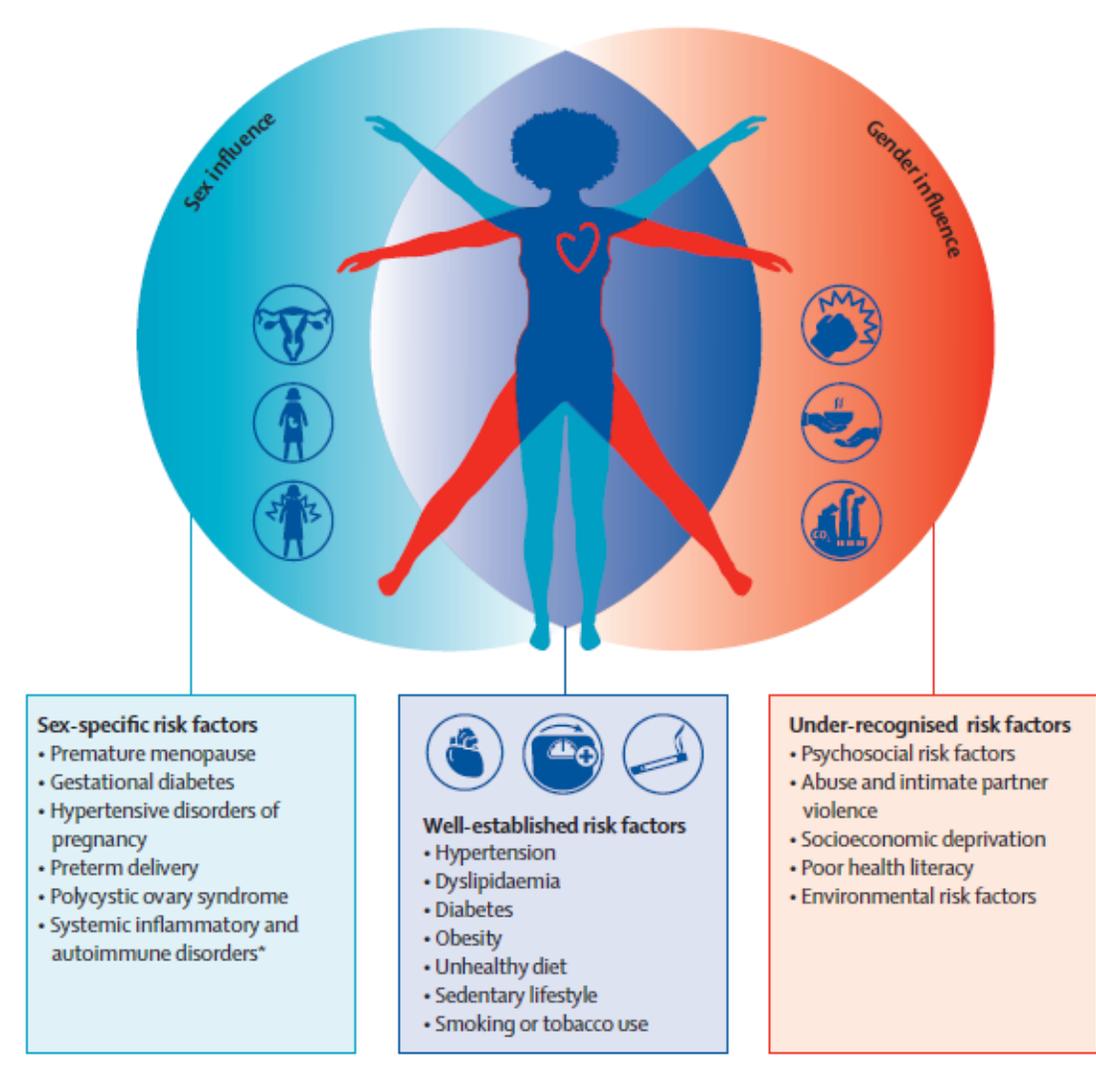
| Clinical condition | Recommendations | Class ^a | Level ^b |
|-------------------------|---|--------------------|--------------------|
| Inflammatory conditions | Assessment of total CVD risk may be considered in adults with chronic inflammatory conditions. ¹⁷⁶ | IIb | B |
| | Multiplication of calculated total CVD risk by a factor of 1.5 should be considered in adults with rheumatoid arthritis. ^{177,178} | IIa | B |
| Migraine | Presence of migraine with aura should be considered in CVD risk assessment. ^{179–181} | IIa | B |
| | Avoidance of combined hormonal contraceptives may be considered in women with migraine with aura. ^{182,183} | IIb | B |

2021 ESC Guidelines on cardiovascular disease prevention in clinical practice

Recommendations for cardiovascular disease assessment in specific clinical conditions

| Clinical condition | Recommendations | Class ^a | Level ^b |
|-------------------------|---|--------------------|--------------------|
| Sex-specific conditions | In women with a history of pre-eclampsia and/or pregnancy-induced hypertension, periodic screening for hypertension and DM should be considered. ^{184–187} | IIa | B |
| | In women with a history of polycystic ovary syndrome or gestational DM, periodic screening for DM should be considered. ^{188–191} | IIa | B |
| | In women with a history of premature or stillbirth, periodic screening for hypertension and DM may be considered. ^{192,193} | IIb | B |
| | Assessment of CVD risk should be considered in men with ED. | IIa | C |

Facteurs de risque: particularités de sexe, de genre et d'impact



PRÉSENTATION CLINIQUE

Les symptômes spécifiques de la femme

- La douleur thoracique reste présente dans 70 % des cas dans les 2 sexes
- Une femme présentant un STEMI a 1,51 plus de chance qu'un homme de ne pas présenter de douleur thoracique



Sex Differences in the Presentation and Perception of Symptoms Among Young Patients With Myocardial Infarction

Evidence from the VIRGO Study (Variation in Recovery: Role of Gender on Outcomes of Young AMI Patients)

- Les femmes présentent plus et plus fréquemment des symptômes **associés** :
 - Indigestions, nausées, maux d'estomac
 - Douleur (ou inconfort) : mâchoire, cou, bras, entre les omoplates
 - Souffle court (essoufflement à l'effort ou au repos)

- **WAMIF:**
- 91.6% Typical chest pain
- 59.7% had associated symptoms

La perception des patientes lors du SCA

- **54 % des femmes** pensent que leurs symptômes **ne sont pas dus** à un problème cardiaque
- La moitié d'entre elles rattachent leurs symptômes à un problème gastrique, une indigestion ou un stress

Sex Differences in the Presentation and Perception of Symptoms Among Young Patients With Myocardial Infarction

Evidence from the VIRGO Study (Variation in Recovery: Role of Gender on Outcomes of Young AMI Patients)

| | Overall | | | Among Patients With STEMI | | | Among Patients With NSTEMI | | | Among Patients With No Chest Pain | | |
|--|----------------|-------------|--------|---------------------------|-------------|--------|----------------------------|-------------|--------|-----------------------------------|-------------|-------|
| | Women (n=2009) | Men (n=976) | P* | Women (n=922) | Men (n=563) | P* | Women (n=1087) | Men (n=413) | P* | Women (n=261) | Men (n=102) | P* |
| Individual symptoms, % | | | | | | | | | | | | |
| Chest pain, pressure, tightness, or discomfort | 87.0 | 89.5 | 0.185 | 87.3 | 91.5 | 0.092 | 86.8 | 86.9 | 1 | | | |
| Dizziness | 28.0 | 26.3 | 0.774 | 29.5 | 28.1 | 1 | 26.7 | 23.8 | 0.999 | 21.9 | 22.8 | 1 |
| Epigastric: indigestion, nausea, or stomach pain, pressure, burning, or discomfort | 61.5 | 50.2 | <0.001 | 67.1 | 53.1 | <0.001 | 56.8 | 46.2 | 0.003 | 55.2 | 51.0 | 1 |
| Pain/discomfort in jaw, neck, arms, or between shoulder blades | 64.9 | 58.1 | 0.002 | 67.7 | 58.6 | 0.003 | 62.6 | 57.3 | 0.293 | 55.4 | 48.5 | 1 |
| Palpitations | 18.7 | 12.5 | <0.001 | 15.4 | 11.0 | 0.103 | 21.5 | 14.6 | 0.022 | 8.5 | 11.9 | 1 |
| Shortness of breath | 52.8 | 47.6 | 0.043 | 51.2 | 48.7 | 1 | 54.2 | 46.1 | 0.035 | 41.2 | 42.6 | 1 |
| Sweating | 53.3 | 55.5 | 0.774 | 62.1 | 63.1 | 1 | 45.8 | 45.1 | 1 | 39.2 | 40.6 | 1 |
| Weakness or fatigue | 45.2 | 40.9 | 0.142 | 46.1 | 43.7 | 1 | 44.4 | 37.1 | 0.068 | 31.9 | 32.7 | 1 |
| Confusion | 12.1 | 11.2 | 0.774 | 13.3 | 12.6 | 1 | 11.0 | 9.2 | 0.999 | 10.0 | 4.0 | 0.496 |
| Number of associated, non-chest pain symptoms | | | | | | | | | | | | |
| Mean (SD) | 3.4 (2.0) | 3.0 (1.9) | <0.001 | 3.5 (1.9) | 3.2 (1.9) | 0.001 | 3.2 (2.0) | 2.8 (1.9) | <0.001 | 2.6 (1.7) | 2.5 (1.5) | 0.582 |
| 0 symptoms, % | 5.6 | 6.7 | <0.001 | 4.2 | 5.7 | 0.009 | 6.8 | 8.0 | <0.001 | 4.2 | 4.9 | 0.801 |
| 1–2 symptoms, % | 32.5 | 38.5 | | 29.8 | 36.8 | | 34.7 | 40.9 | | 49.4 | 50 | |
| 3–4 symptoms, % | 33.0 | 33.4 | | 36.2 | 33.6 | | 30.2 | 33.2 | | 31.8 | 34.3 | |
| >4 symptoms, % | 29.0 | 21.4 | | 29.7 | 24.0 | | 28.3 | 17.9 | | 14.6 | 10.8 | |

Atteintes coronaires particulières

Physiopathologie

- Femme jeune: + FdR, + sévère
- Physiopathologie ≠ 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

Données anatomiques

- Artères de tailles inférieures *(Canos JACC 2004, Schampaert JACC 2004)*
 - Moins de succès de revascularisation
 - Majore le risque d'ischémie
- Remodelage positif plus fréquent
- Fréquence de l'absence d'atteinte coronaire obstructive:
 - 60% des patientes symptomatiques ou preuve d'ischémie par test non invasif vs 17% hommes *(WISE, JACC. 1999)*

Dissection coronaire spontanée

• Incidence ?

- 0.07–0.2% toutes coro
- 2–4% si SCA
- 24% si SCA + Femme+ <50 ans
- 36% si SCA + Femme+ <60 ans+ < 1FdR
- Grossesse et peripartum < 10%
- SCAD 50% évènements coronaires et 25% des IDM lors Grossesse et peripartum

Table 3. Prevalence of spontaneous coronary artery dissection among acute coronary syndrome cases at our institution during the 2012-2014 period.

| | ACS | SCAD | Ratio (%) (SCAD/ACS) | NSNDS |
|----------------------|-------|------|----------------------|-------|
| All comers | 3,224 | 36 | 1.1 | 90 |
| Women | 969 | 36 | 3.7 | 27 |
| Women <60 years | 234 | 27 | 11.5 | 9 |
| Women <50 years | 111 | 17 | 15.3 | 7 |
| Women <60 ≤2 CRF | 132 | 26 | 19.7 | 5 |
| Women <60 non-smoker | 64 | 18 | 28.2 | 4 |
| Women <60 ≤1 CRF | 56 | 20 | 35.7 | 3 |

ACS: acute coronary syndrome; CRF: cardiovascular risk factors; NSNDS: number of patients admitted for acute coronary syndrome needed to diagnose one case of spontaneous coronary artery dissection; SCAD: spontaneous coronary artery dissection

- 18-84 ans
- Age moyen: 44-53 ans
- 90% femmes
- FdR?

Table 1 Demographics and risk factors of patients with spontaneous coronary artery dissection (SCAD) in contemporary case series (studies with $n > 20$)

| | Max N | Age (years) | Gender (female, %) | HTN (%) | Chol (%) | Smoking (%) | DM (%) | FH (%) | P-SCAD (%) |
|-----------------------------|-------|-------------|--------------------|---------|----------|-------------|--------|--------|------------|
| Mayo Clinic ³ | 189 | 44 ± 9 | 92 | 31 | 22 | 15 | 2 | NA | 15 |
| Saw ⁴ | 168 | 52 ± 9 | 92 | 39 | 24 | 13 | 5 | 29 | 2 |
| Lettieri ⁵ | 134 | 52 ± 11 | 81 | 51 | 33 | 34 | 2 | 25 | NA |
| Faden ⁶ | 79 | 33 ± 5 | 100 | 17 | 18 | 17 | 11 | NA | 100 |
| Rogowski ⁷ | 64 | 53 ± 11 | 94 | 45 | 52 | 28 | 0 | 19 | 5 |
| Nakashima ⁸ | 63 | 46 ± 10 | 94 | 33 | 23 | 32 | 0 | 8 | 8 |
| Motreff ¹³ | 55 | 50 | 100 | 27 | 11 | 22 | 4 | 22 | 4 |
| McGrath-Cadell ⁹ | 40 | 45 ± 10 | 95 | 18 | 10 | 8 | 5 | 28 | 8 |
| Roura ¹⁰ | 34 | 47 ± 12 | 94 | NA | NA | NA | NA | | 15 |
| Alfonso ¹¹ | 27 | 52 ± 10 | 85 | 37 | 33 | 52 | 4 | NA | 4 |
| Ito ¹² | 23 | 45 ± 11 | 100 | 57 | 22 | 30 | 4 | NA | 30 |
| Vanzetto ¹⁴ | 23 | 46 ± 9 | 74 | 26 | 39 | 43 | 13 | 13 | 0 |
| Mortensen ¹⁵ | 22 | 49 ± 9 | 81 | 38 | NA | 57 | 0 | 40 | 10 |
| Rashid ¹⁶ | 21 | 53 ± 9 | 95 | 48 | 48 | 47 | 5 | 24 | 0 |

Data are given as mean ± standard deviation or percentages.

HTN, hypertension; Chol, dyslipidaemia; DM, diabetes mellitus; FH, family history of coronary artery disease; NA, not available; P-SCAD, pregnancy-associated coronary artery dissection.

- Influence hormonale: P-SCAD
 - Multiparité, hormone, pré-éclampsie
 - T3 principalement
 - Post partum plutôt précoce
 - Plus sévère STEMI 64% Choc 24% Arret 14% décès 4,5%
- Dysplasie fibromusculaire
- Inflammation
- Exercice extrême: plutôt hommes
- Stress émotionnel: plutôt femmes
- Anomalies du tissus conjonctif

Présentation

- Douleur thoracique 60-90%
- Irradiations:
 - bras 49%
 - Cou 22%
 - Nausées, vomissements 23%
 - Dyspnée 19%
 - Douleur dorsale 12%
- Atypies : brûlures 9%, pleural 3% positionnel 1%
- Prise en charge souvent retardée

Physiopathologie

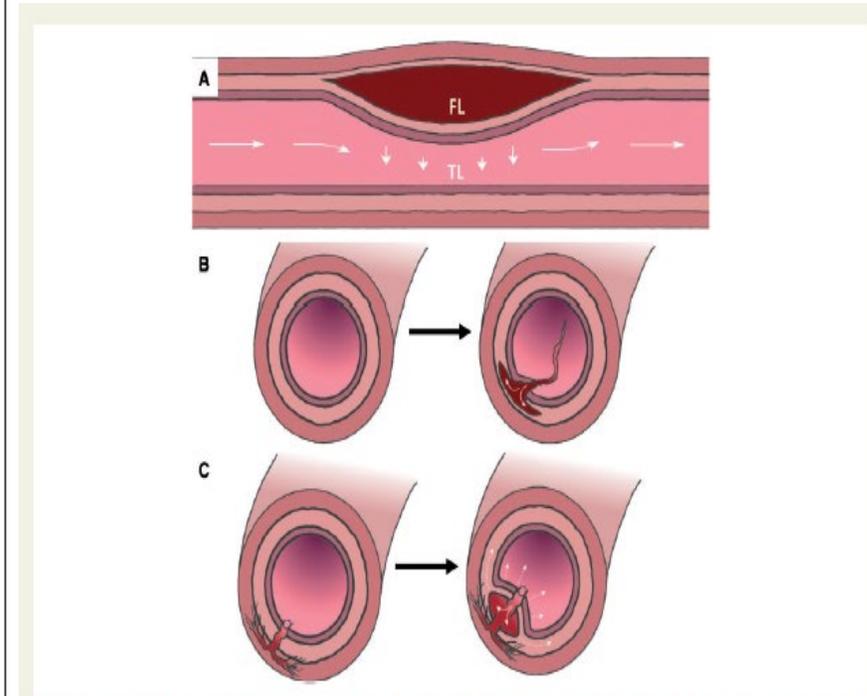
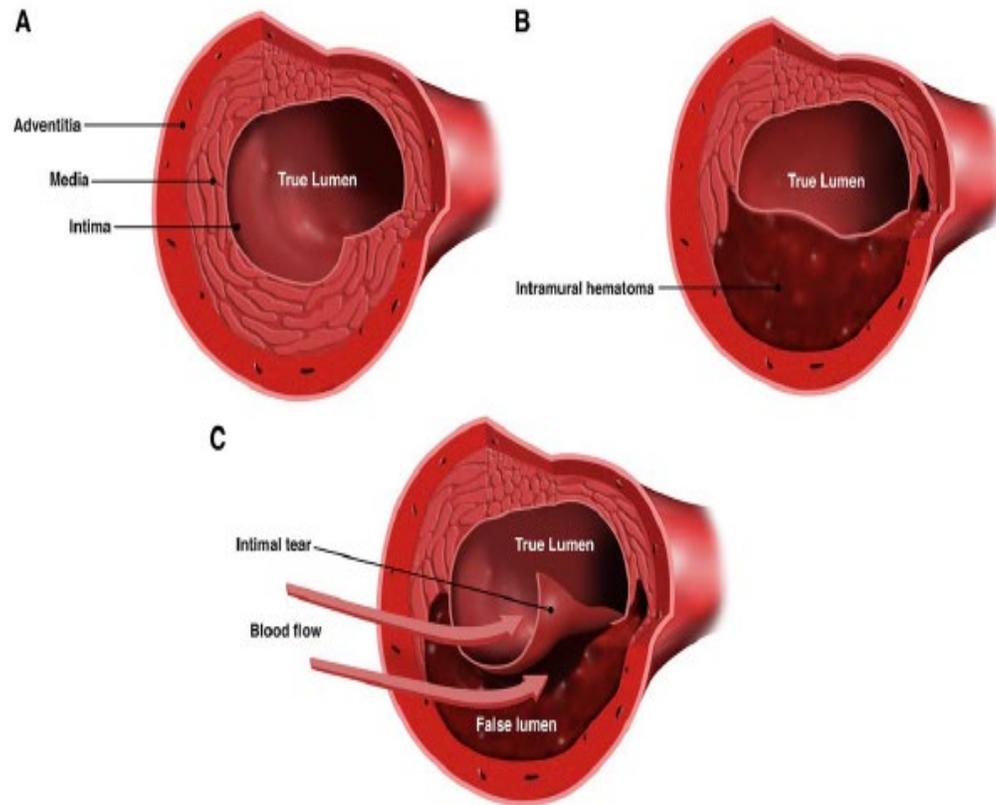
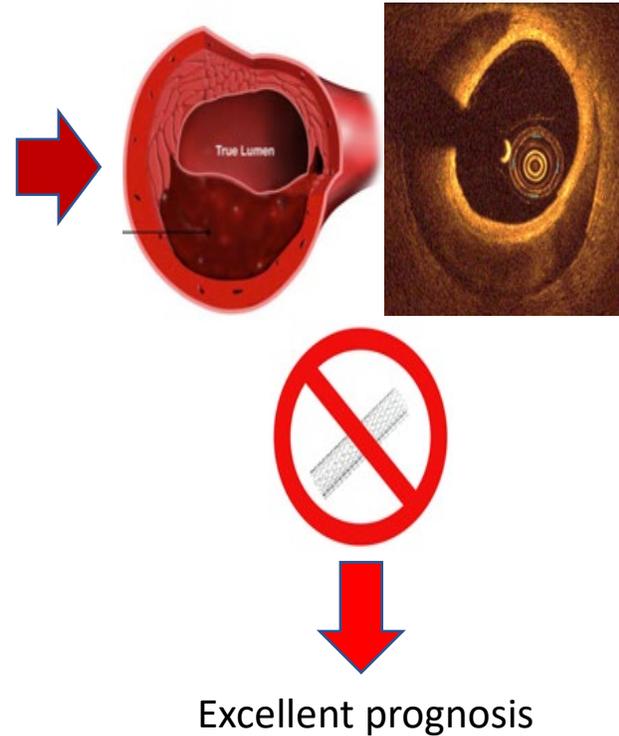


Figure 1 Schematic illustration of spontaneous coronary artery dissection. Accumulation and axial propagation of blood forms a false lumen in the outer third of the tunica media leading to external compression of the true lumen (A). Blood may enter through an endothelial-intimal disruption or 'tear' (B) or as a result of bleeding from a microvessel within the vessel wall (C) leading to an expanding and compressing false lumen (dotted arrows).

| Coronary Angiograms (n=373) | | |
|-----------------------------|-------------|-------------|
| No atheroma | 361 | 96.8% |
| Monotrucular | 351 | 94.1% |
| LAD/ Cx / RCA | 199/ 97/ 55 | 57% 28% 16% |
| TIMI 0 or 1 Flow | 104 | 25.7% |
| Hematoma | 313 | 83.9% |
| Dissection | 61 | 16.3% |
| Initial Treatment | | |
| Conservative | 315 | 84.4% |
| PCI | 57 | 15.3% |
| Bypass | 0 | 0% |
| Circulatory Assistance | 1 | 0.3% |
| Prognosis | | |
| Hospital Mortality | 0 | 0% |
| Mortality @ 1 year | 0 | 0% |
| MACE @ 1 year | 23 | 6.0% |
| Recurrence @ 1 year | 12 | 2.9% |



MINOCA

MINOCA: MI with Non Obstructive Coronary Arteries

1. ***Acute MI diagnosis (Third Universal Definition)***
 - a. Rise/Fall cardiac marker (Preferably Troponin)
 - b. Corroborative clinical evidence of infarction
 - i.e. Ischaemic symptoms or ECG changes
2. ***Non-obstructive coronary arteries on angiography***
 - i.e. no coronary artery stenosis $\geq 50\%$

MINOCA in main stream

EXPERT CONSENSUS DOCUMENT

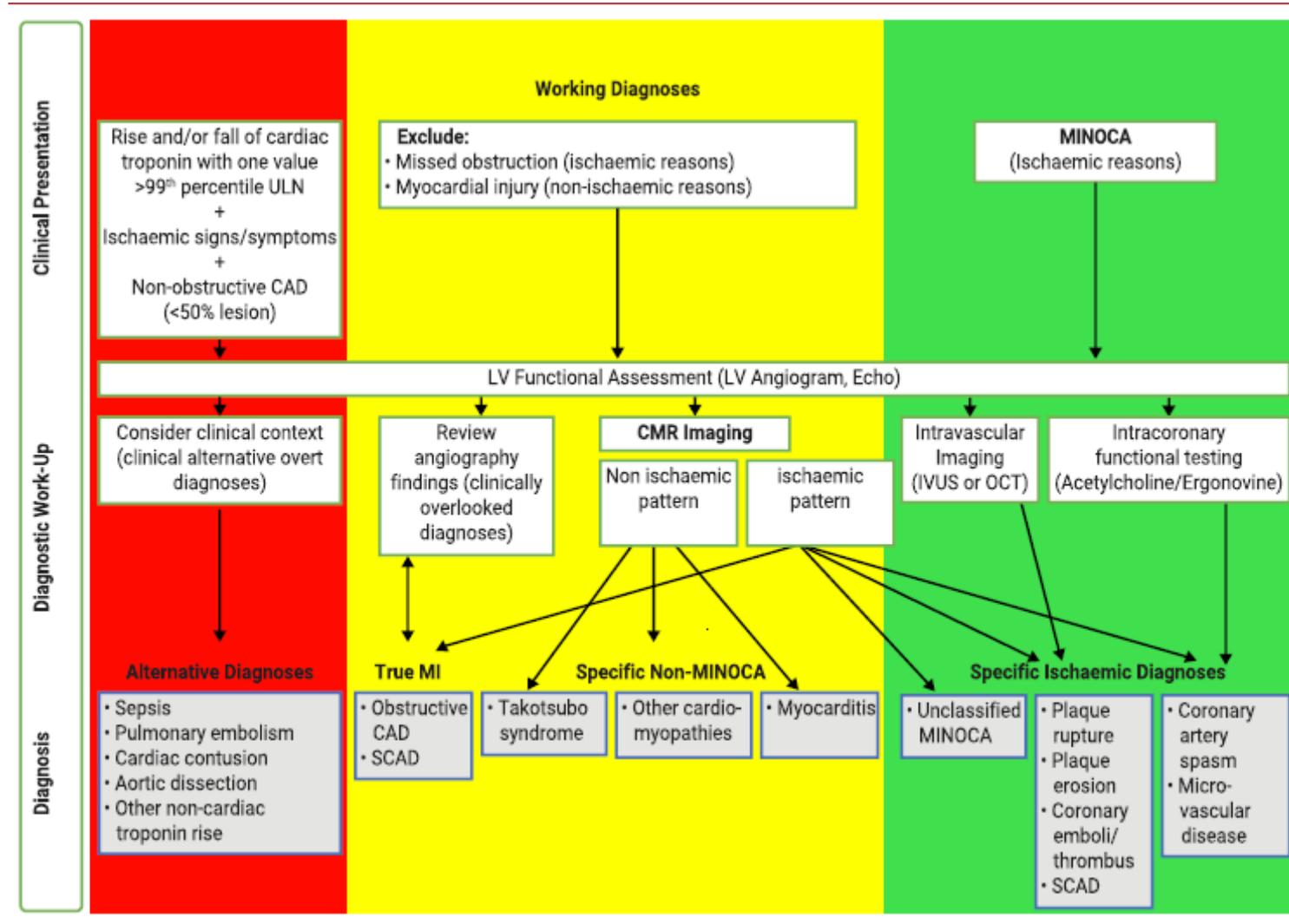
Fourth Universal Definition of
Myocardial Infarction (2018)

- MI = Myocardial injury + Myocardial Ischemia
- MINOCA = Myocardial injury due to ischemic mechanism
 - Plaque disruption ± thrombus
 - Coronary artery spasm
 - microvascular dysfunction
 - Coronary embolism
 - Coronary artery dissection

20. MYOCARDIAL INFARCTION WITH NON-OBSTRUCTIVE CORONARY ARTERIES

It is increasingly recognized that there is a group of MI patients with no angiographic obstructive CAD ($\geq 50\%$ diameter stenosis in a major epicardial vessel), and the term myocardial infarction with non-obstructive coronary arteries (MINOCA) has been coined for this entity (95,96). The diagnosis of MINOCA, like the diagnosis of MI, indicates that there is an ischaemic mechanism responsible for the myocyte injury (i.e. non-ischaemic causes such as myocarditis have been excluded). Furthermore, the diagnosis of MINOCA necessitates that obstructive CAD has not been inadvertently overlooked (e.g. spontaneous coronary artery dissection)

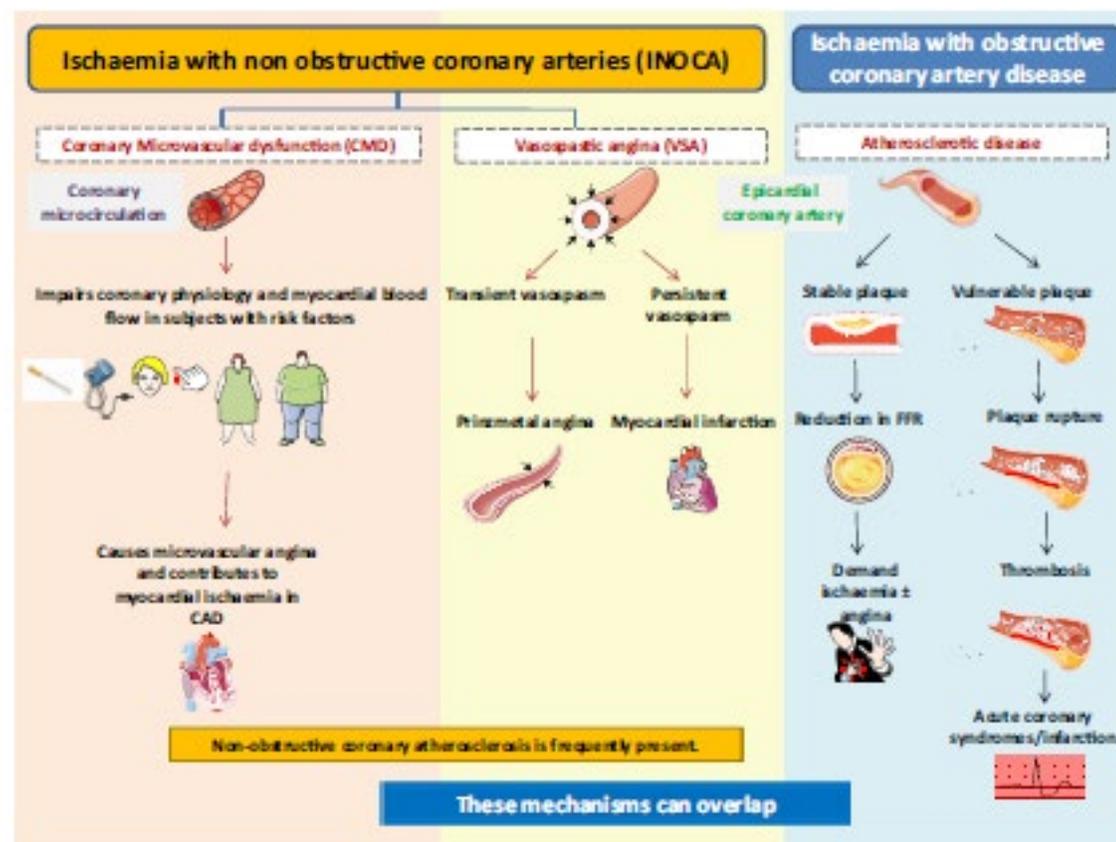
MINOCA



- Les MINOCA ne sont pas rares : 6-8% % des SCA (1 à 14%)
- MINOCA Femmes 5x + que les hommes (VIRGO MINOCA = Women had 5 times higher odds of having MINOCA than men (14.9% versus 3.5%; odds ratio: 4.84; 95% confidence interval, 3.29–7.13)
- Plus fréquemment sans facteurs de risque traditionnel (8.7% versus 1.3%; $P < 0.001$) comparé aux MI-CAD (infarctus avec obstruction)
- Pronostic meilleur que la « coronaropathie obstructive mais mortalité à 12 mois à 4,7% sauf chez les plus jeunes (< 50 ans : pronostic relativement comparable 12-mois: 0.6% and 2.3% [$P = 0.68$], respectively)
- HARP-MINOCA: 85% Dg avec OCT + IRM

An EAPCI Expert Consensus Document on Ischaemia with Non-Obstructive Coronary Arteries in Collaboration with European Society of Cardiology Working Group on Coronary Pathophysiology & Microcirculation Endorsed by Coronary Vasomotor Disorders International Study Group

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Une prise en charge différente?

LE SCA de la femme: délais et traitements

- Délai appel : + 15 min en moyenne ajustée (*Manzo-Silberman et al, Int J Cardiol 2018*)
- Délai système: pas de différence
- Moins d'exploration/revascularisation
- Moins d'anti agrégants, de statines, d'IEC (*Simon T et al, EHJ 2006; Schiele et al, Am J C2011*)

Délais STEMI

| | Unadjusted Analysis* | | | Adjusted Analysis** | | |
|----------------------------|----------------------|---------------|--------|---------------------|--------------|--------|
| | Men | Women | P | Men | Women | P |
| PATIENT DELAY | n = 12,427 | n = 3,859 | | n = 12,426 | n = 3,859 | |
| Mean ± SD* Or EMM ±SE** | 122.3 ± 140.6 | 149.2 ± 153.2 | | 134.6 ± 1.6 | 150.1 ± 2.5 | |
| Mean difference (95%CI) | 26.8 (21.4-32.3) | | <0.001 | 14.4 (9.3-19.5) | | <0.001 |
| ISCHEMIC DELAY | n = 10,979 | n = 3,151 | | n = 10,972 | n = 3,151 | |
| Mean ± SD* Or EMM ±SE** | 293.3 ± 798.5 | 360.7 ± 794.1 | | 385.6 ± 10.7 | 404.4 ± 16.2 | |
| Mean difference (95%CI) | 16.1 (35.8-98.8) | | <0.001 | 18.8 (-13.4-51.0) | | 0.25 |
| SYSTEM DELAY | n = 10,979 | n = 3,151 | | n = 10,978 | n = 3,151 | |
| Mean ± SD* Or EMM ±SE** | 186.1 ± 780.3 | 233.0 ± 773.1 | | 281.1 ± 10.5 | 287.5 ± 15.8 | |
| Mean difference (95%CI) | 15.7 (16.2-77.6) | | 0.003 | 6.4 (-25.2-37.9) | | 0.69 |

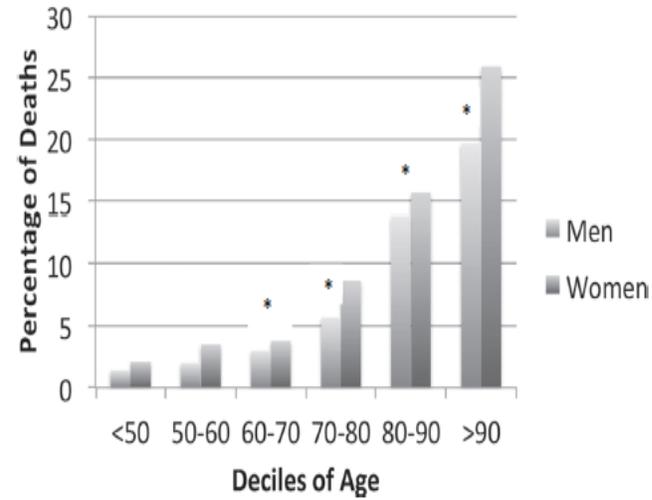
| | Men (N = 12,712) | Women (N = 4021) | Total (N = 16,733) | p Value |
|--|---------------------|---------------------|-----------------------|---------|
| <i>ST-elevation management</i> | | | | |
| Use of emergency call number n (%) | 8729 (68.7) | 2555 (63.5) | 11,284 (67.4) | <0.001 |
| Pre-hospital aspirin n (%) N = 10,000 | 7278 (94.9) | 2177 (93.4) | 9455 (94.6) | 0.018 |
| Pre-hospital P2Y12 inhibitors n (%) N = 9616 | 6457 (87.7) | 1916 (85) | 8373 (87.1) | 0.004 |
| Pre-hospital GPIIb/IIIa inhibitors n (%) N = 10,837 | 2783 (33.5) | 716 (28.3) | 3499 (32.3) | <0.001 |
| Reperfusion n (%) | | | | <0.001 |
| Fibrinolysis only | 774 (6.2) | 170 (4.4) | 944 (5.8) | |
| Primary PCI | 8396 (67.6) | 2574 (66.7) | 10,970 (67.4) | |
| Rescue PCI | 1815 (14.6) | 408 (10.6) | 2223 (13.6) | |
| No reperfusion | 1442 (11.6) | 707 (18.3) | 2149 (13.2) | |

CABG: coronary aortic bypass grafting; CAD: coronary artery disease; HBP: High Blood Pressure; PCI: percutaneous coronary intervention; SD: standard deviation.

^a N indicates the number of patients with available data.

Un pronostic spécifique post SCA

Mortalité hospitalière



| | <50 | 50-59 | 60-69 | 70-79 | 80-89 | >90 |
|------------|------|---------------|---------------|---------------|----------------|-----------------|
| Female (n) | 383 | 463 | 589 | 937 | 1024 | 174 |
| Male (n) | 2423 | 2948 | 3110 | 1921 | 1860 | 84 |
| OR | ref | 1.44 | 2.11 | 4.59 | 11.24 | 20.35 |
| IC | | 0.99- 2.12 | 1.47- 3.04 | 3.27- 6.45 | 8.07- 15.64 | 13.29- 31.16 |
| P value | | 0.06 | <0.001 | <0.001 | <0.001 | <0.001 |

Fig. 2. In-hospital mortality rate according to age in deciles. Univariate odds ratio and interquartile range for in-hospital mortality.

Sex Differences in Short-, Long-term Mortality Among Patients With STEMI Treated With PCI

Meta-analysis of data from 35 studies including 41,766 patients (18,555 women) treated with primary PCI within 12 hours of symptom onset.

Mortality Risk:

Women vs Men

In-Hospital

Unadjusted

RR

95% CI

P Value

1.93

1.75-2.14

< .001

Adjusted

1.48

1.07-2.05

.02

At 1 Year

Unadjusted

1.58

1.36-1.84

< .001

Adjusted

0.90

0.69-1.17

.42

Conclusion: Women are more likely than men to die in-hospital after PCI for STEMI, perhaps due to modifiable risk factors.

- IDM femme <60 ans : une incidence croissante
- 85% FdR traditionnels « modifiables »
- 75% tabac
- 25% dyslipidémie « classique », <1/3 traitée

- **Evaluation adaptée du risque CV**
- **Place dépistage**
- **Collaboration MG-Gyn-Cardio**
- **Diagnostic précis SCA:**
 - **Imagerie endocoronaire**
 - **Imagerie en coupes**
- **Prévention secondaire adaptée**

Merci de votre attention,
A vos questions!

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