

Stress et Evènements cardio-vasculaires : marqueur ou facteur de risque ?

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C'est quoi le stress ?

- Définition OMS : Etat d'inquiétude ou de tension mentale causé par une situation difficile

C'est quoi la différence entre marqueur et facteur de risque ?

- Marqueur de risque : une caractéristique de l'individu associée à l'incidence d'une pathologie
- Pour devenir un facteur de risque, la caractéristique doit :
 - 1/ précéder l'apparition de la pathologie
 - 2/ présenter une relation dose-effet
 - 3/ avoir un caractère universel
 - 4/ une liaison forte et indépendante
 - 5/ générer une diminution incidence de la pathologie si la caractéristique est abaissée qualitativement et/ou quantitativement

2 contextes différents

- Stress aigu :
- Réaction immédiate à une situation jugée menaçante : peur, urgence, accident

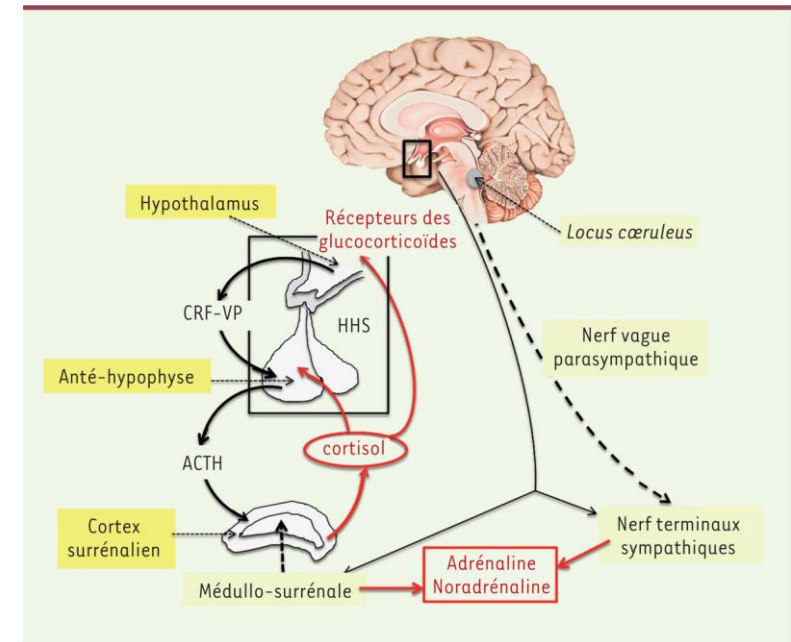
- Stress chronique :
- Exposition prolongée à une situation jugée contraignante, hostile :
travail, conflit, précarité
- Syndrome post-traumatique

Mécanismes physio-pathologiques

- Activation ponctuelle ou durable

du système sympathique

de l'axe hypothalamo-hypophyso-surrénalien



Il en résulte :

- Augmentation catécholamines :

Tachycardie, augmentation PA, vasoconstriction

- Augmentation cortisol :

Hyperglycémie, augmentation PA, appétit augmenté, prise de masse grasse

- Augmentation cytokines pro-inflammatoires :

Effet déstabilisant de plaque athéromateuse

- Dysfonction endothéliale :

Athéromatose, fragilisation plaques endo-coronaires, défaut vaso-dilatation, spasmes

Événements cliniques potentiellement induits au niveau cardio-vasculaire

- HTA
- Coronaropathie
- Arythmie
- AVC
- Syndrôme Tako-Tsubo

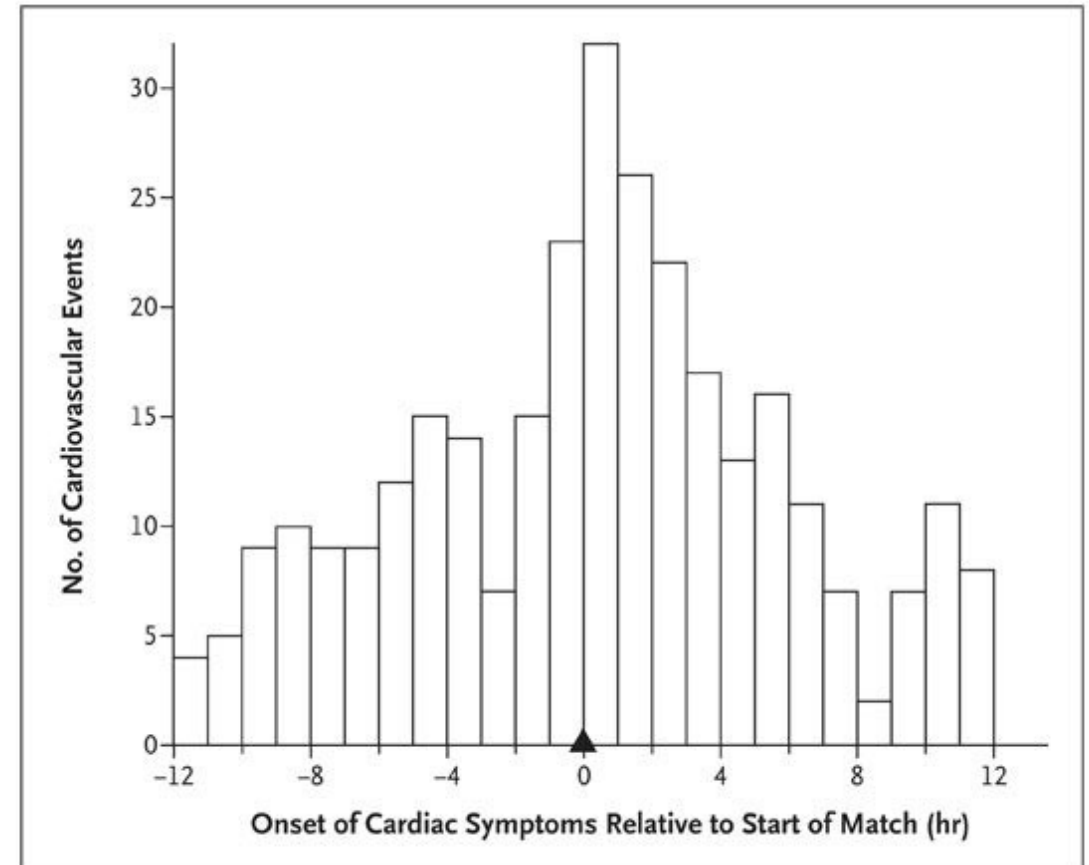
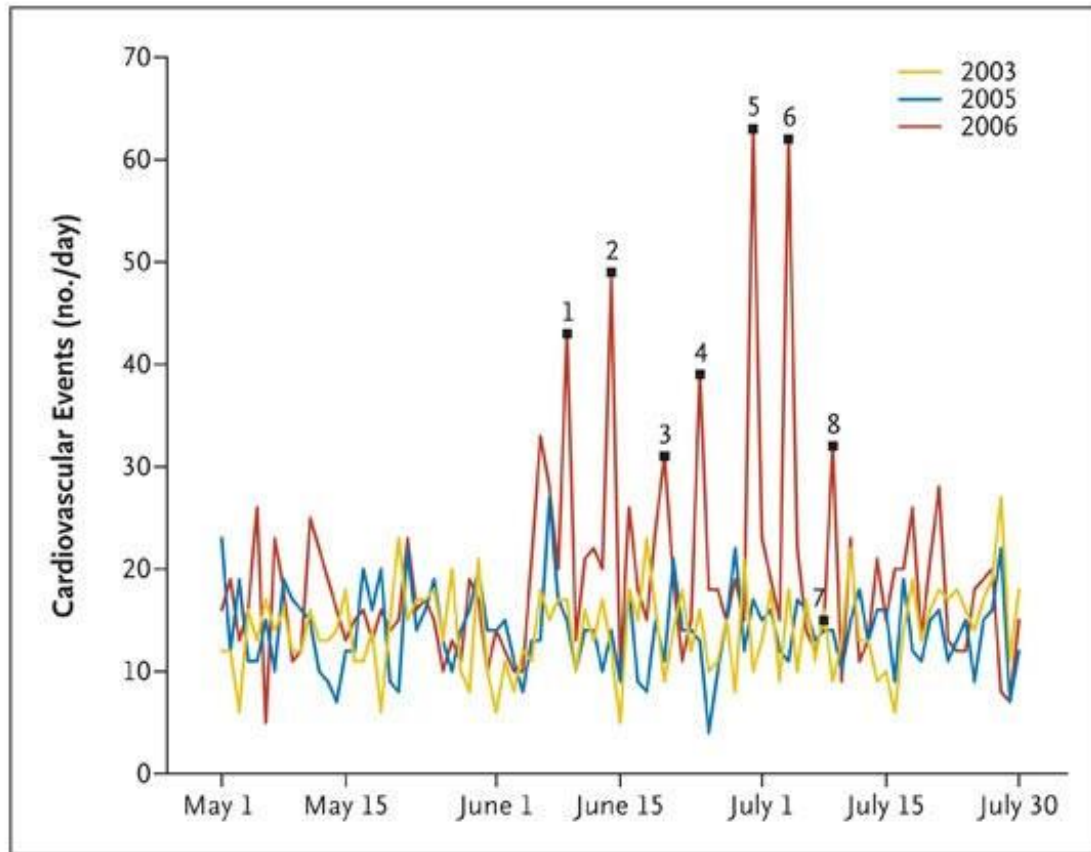
Mais aussi des modifications comportementales

- Tabagisme augmenté
- Consommation sucres rapides, corps gras
- Prise d'alcool

- Altération qualitative et quantitative sommeil
- Moindre activité physique
- Moindre adhésion aux traitements médicamenteux

Stress ponctuel : l'effet Coupe du Monde Germany 2006

Wilbert-Lampen U et al, N Engl J Med 2008



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Wilbert-Lampen U et al, N Engl J Med 2008

Table 3. Incidence Ratios for Cardiovascular Events on Days during the World Cup, as Compared with Days during the Control Period, According to the Final Diagnosis.*

Diagnostic Category	Event during 7 Days of Matches Involving Germany (N=302)	Event during 24 Days of the World Cup without German Matches (N=436)	Event during 242 Days of the Control Period (N=3541)
STEMI			
No. of patients	43	73	634
No. of events per day	6.1	3.0	2.6
Incidence ratio (95% CI)	2.49 (1.47–4.23)	1.09 (0.69–1.75)	1.00
P value	<0.001	0.71	
NSTEMI or unstable angina			
No. of patients	171	243	1873
No. of events per day	24.4	10.1	7.7
Incidence ratio (95% CI)	2.61 (2.22–3.08)	1.11 (0.96–1.28)	1.00
P value	<0.001	0.17	
Cardiac arrhythmia causing major symptoms			
No. of patients	71	89	767
No. of events per day	10.1	3.7	3.2
Incidence ratio (95% CI)	3.07 (2.32–4.06)	1.13 (0.87–1.47)	1.00
P value	<0.001	0.35	
Cardiac arrhythmia causing minor symptoms			
No. of patients	17	31	267
No. of events per day	2.4	1.3	1.1
Incidence ratio (95% CI)	2.13 (1.24–3.66)	1.10 (0.71–1.71)	1.00
P value	0.006	0.66	
Any category			
No. of patients	302	436	3541
No. of events per day	43.1	18.2	14.6

* Cardiac arrhythmias causing major symptoms were defined as those characterized by atrial fibrillation with rapid conduction (>100 beats per minute), ventricular tachycardia, cardiac arrest, or discharge of an implantable cardioverter–defibrillator. The composite of cardiac arrhythmias causing minor symptoms were defined as those characterized by sinus tachycardia, sinus bradycardia, atrial fibrillation with normal conduction, or premature beats. Incidence ratios were calculated as the mean number of cardiovascular events per day for days during the World Cup divided by the mean number per day for days during the control period. Data were adjusted for environmental and temporal variables. NSTEMI denotes myocardial infarction without ST-segment elevation, and STEMI myocardial infarction with ST-segment elevation.

Stress chronique, 118 000 adultes,
MACE à 18 ans,
dans 21 pays à faible, moyen et haut
niveau de vie

Santosa A et al JAMA 2021

Table 4. Adjusted HRs of Composite Score of Psychosocial Factors and Outcomes in Men and Women

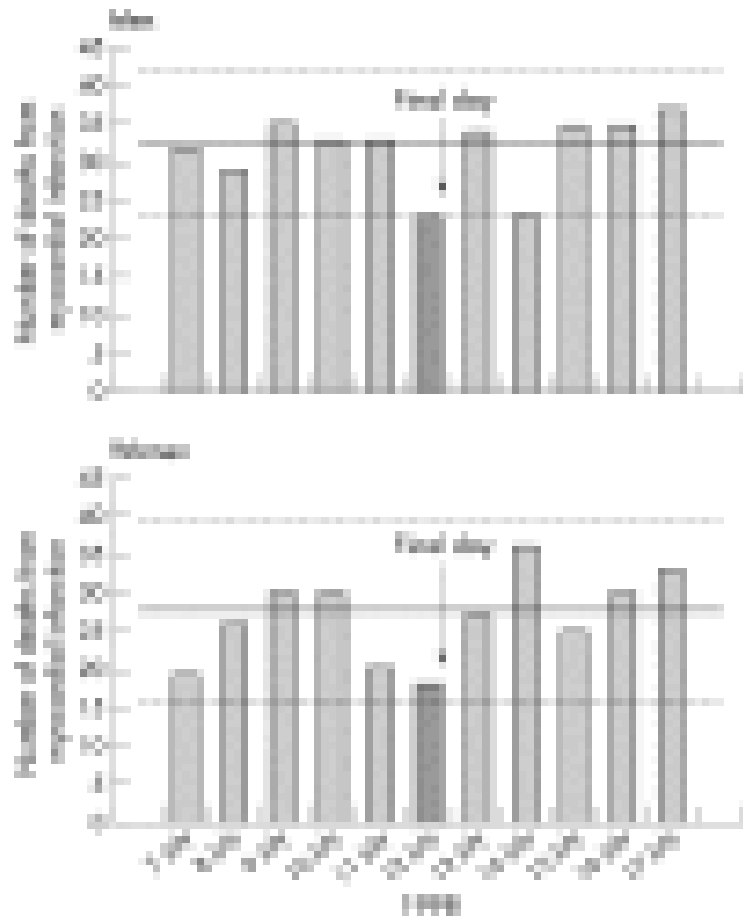
Outcome	Adjusted HR (95% CI) ^a	
	Men	Women
All-cause death		
Low stress	1.14 (1.06-1.24)	1.03 (0.94-1.12)
Medium stress	1.21 (1.10-1.33)	1.16 (1.05-1.28)
High stress	1.18 (1.02-1.36)	1.15 (1.00-1.32)
Major CVD		
Low stress	1.04 (0.95-1.13)	1.04 (0.94-1.14)
Medium stress	1.07 (0.96-1.20)	1.08 (0.96-1.21)
High stress	1.38 (1.18-1.61)	1.09 (0.92-1.30)
Major CHD		
Low stress	1.03 (0.93-1.15)	1.18 (1.06-1.33)
Medium stress	1.07 (0.94-1.22)	1.27 (1.10-1.45)
High stress	1.23 (1.02-1.48)	1.35 (1.11-1.64)
Stroke		
Low stress	1.11 (0.98-1.26)	0.97 (0.85-1.11)
Medium stress	1.12 (0.94-1.33)	0.99 (0.83-1.18)
High stress	1.55 (1.21-1.98)	1.07 (0.82-1.40)

Abbreviations: CHD, coronary heart disease; CVD, cardiovascular disease; HR, hazard ratio.

^a Adjusted for age, education, marital status, location, abdominal obesity, hypertension, smoking, diabetes, family history of CVD, and center random effects. No stress was used as the reference group.

A l'inverse, le 12 Juillet 1998, en France

Berthier A et al, Heart2003



A l'inverse, l'affect positif, à 10 ans (1939 adultes canadiens)

Davidson KW et al, Eur H J 2010

Table 1 Baseline characteristics by level of positive affect expression

Variable	Levels of positive affect						P-value trend ^a
	Total (N = 1739)	None (n = 168)	Little (n = 755)	Moderate (n = 592)	Quite a bit (n = 193)	Extreme (n = 31)	
Age	46.2 ± 18.0	45.6 ± 18.1	47.1 ± 17.8	45.7 ± 18.4	44.7 ± 17.5	45.6 ± 19.3	0.24
Male	862 (49.6%)	112 (66.7%)	411 (54.4%)	264 (44.6%)	68 (35.2%)	7 (22.6%)	<0.001
Active smoking	451 (25.9%)	58 (34.5%)	206 (27.3%)	142 (24.0%)	38 (19.7%)	7 (22.6%)	<0.001
Body mass index (kg/m ²)	27.1 ± 5.6	27.5 ± 5.5	27.1 ± 5.4	27.1 ± 5.8	26.4 ± 4.9	27.7 ± 7.4	0.23
Diabetes mellitus	65 (3.7%)	7 (4.2%)	32 (4.2%)	18 (3.0%)	7 (3.4%)	1 (3.2%)	0.41
Total cholesterol (mmol/L)	5.3 ± 1.1	5.4 ± 1.2	5.3 ± 1.1	5.3 ± 1.1	5.2 ± 0.9	4.9 ± 1.2	0.03
Low density lipids (mmol/L)	3.2 ± 0.9	3.2 ± 0.9	3.3 ± 0.9	3.2 ± 0.9	3.2 ± 0.9	2.9 ± 1.0	0.24
Systolic blood pressure (mmHg)	124.7 ± 17.0	126.5 ± 16.2	125.6 ± 17.4	123.4 ± 16.6	123.6 ± 16.7	121.7 ± 18.9	0.008
Diastolic blood pressure (mmHg)	77.0 ± 9.7	78.7 ± 10.0	77.3 ± 10.0	76.4 ± 9.4	76.1 ± 9.4	76.6 ± 10.7	0.006
Depressive symptoms	7.4 ± 8.1	8.9 ± 9.4	7.3 ± 8.2	7.1 ± 7.8	6.9 ± 7.6	7.8 ± 6.6	0.06
Hostility	19.0 ± 8.1	21.1 ± 8.3	19.4 ± 8.4	18.4 ± 7.9	17.4 ± 7.1	17.3 ± 6.5	<0.001
Anxiety	36.6 ± 8.4	37.6 ± 9.8	36.9 ± 8.2	36.3 ± 8.3	36.0 ± 7.9	35.5 ± 8.6	0.03

^aχ² Cochran–Armitage trend test or analysis of variance linear trends.

A l'inverse, l'affect positif à 10 ans

Davidson KW et al, Eur H J 2010

Table 2 Hazard ratios (and 95% confidence intervals) for one unit increase in each psychosocial measure

Predictor	Hazard rate (95% confidence interval)		
	Model 1 ^a	Model 2 ^b	Model 3 ^c
Positive affect	0.73 (0.59–0.90)	0.77 (0.63–0.95)	0.78 (0.63–0.96)
Depressive symptoms	1.04 (1.02–1.06)	1.03 (1.01–1.05)	1.04 (1.01–1.07)
Hostility	1.02 (1.00–1.04)	1.02 (1.00–1.04)	1.01 (0.99–1.03)
Anxious symptoms	1.01 (0.99–1.03)	1.01 (0.99–1.03)	0.97 (0.95–1.00)

En conclusion :

- Le stress remplit tous les critères du facteur de risque
- Comme la dépression, il est un état mental défavorable, activant ou potentialisant de nombreux leviers connus comme foncièrement délétères pour la sphère cardio-vasculaire
- Enfin pris en compte dans les guidelines ESC 2025
- Don't worry, be happy !!

