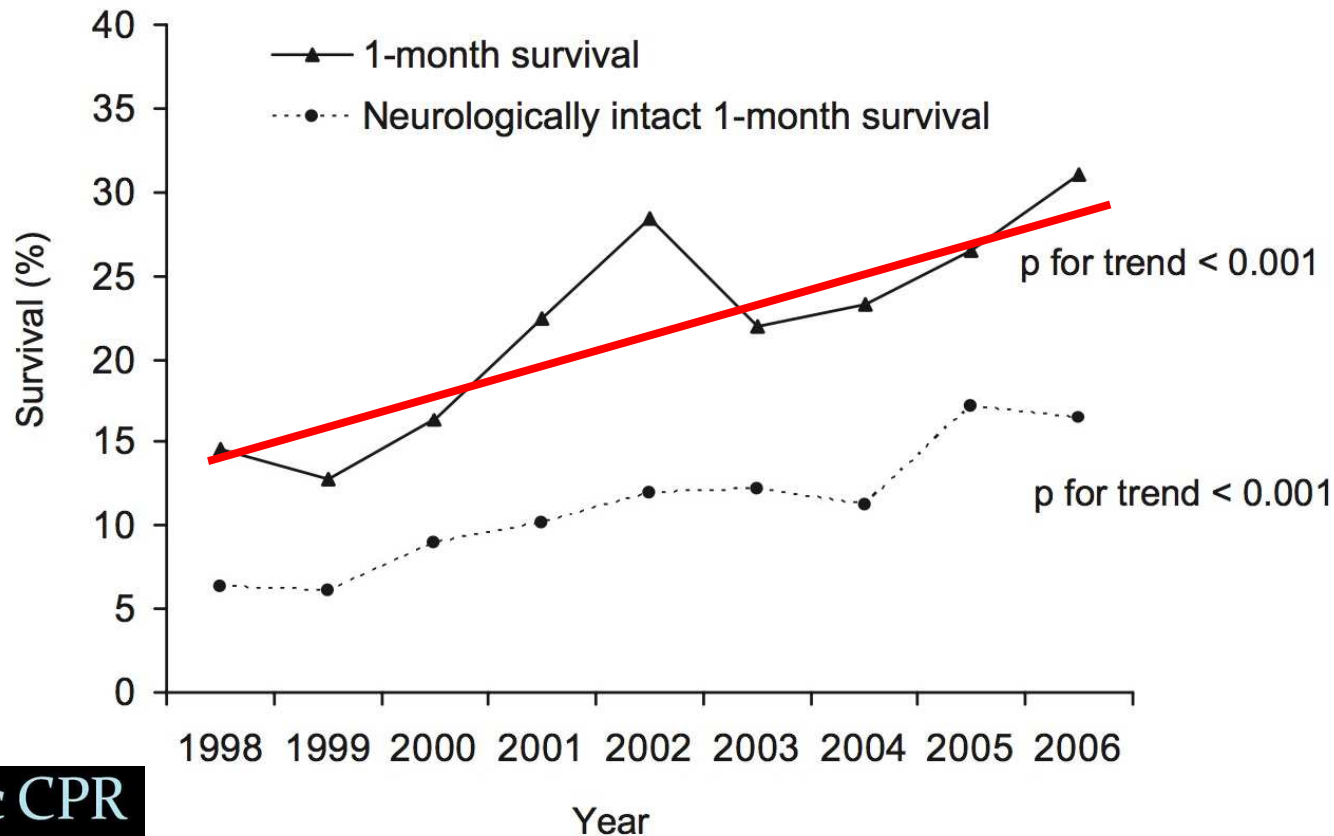


Early Lactate Clearance Is Associated With Improved Outcomes in Patients With Postcardiac Arrest Syndrome: A Prospective, Multicenter Observational Study (SOS-KANTO 2012 Study)

Kei Hayashida, MD^{1,2}; Masaru Suzuki, MD¹; Naohiro Yonemoto, MPH³; Shingo Hori, MD¹; Tomoyoshi Tamura, MD¹; Atsushi Sakurai, MD⁴; Yoshio Tahara, MD⁵; Ken Nagao, MD⁶; Arino Yaguchi, MD⁷; Naoto Morimura, MD⁸; on behalf of the SOS-KANTO 2012 Study Group

Survie et pronostic neurologique post-ACR



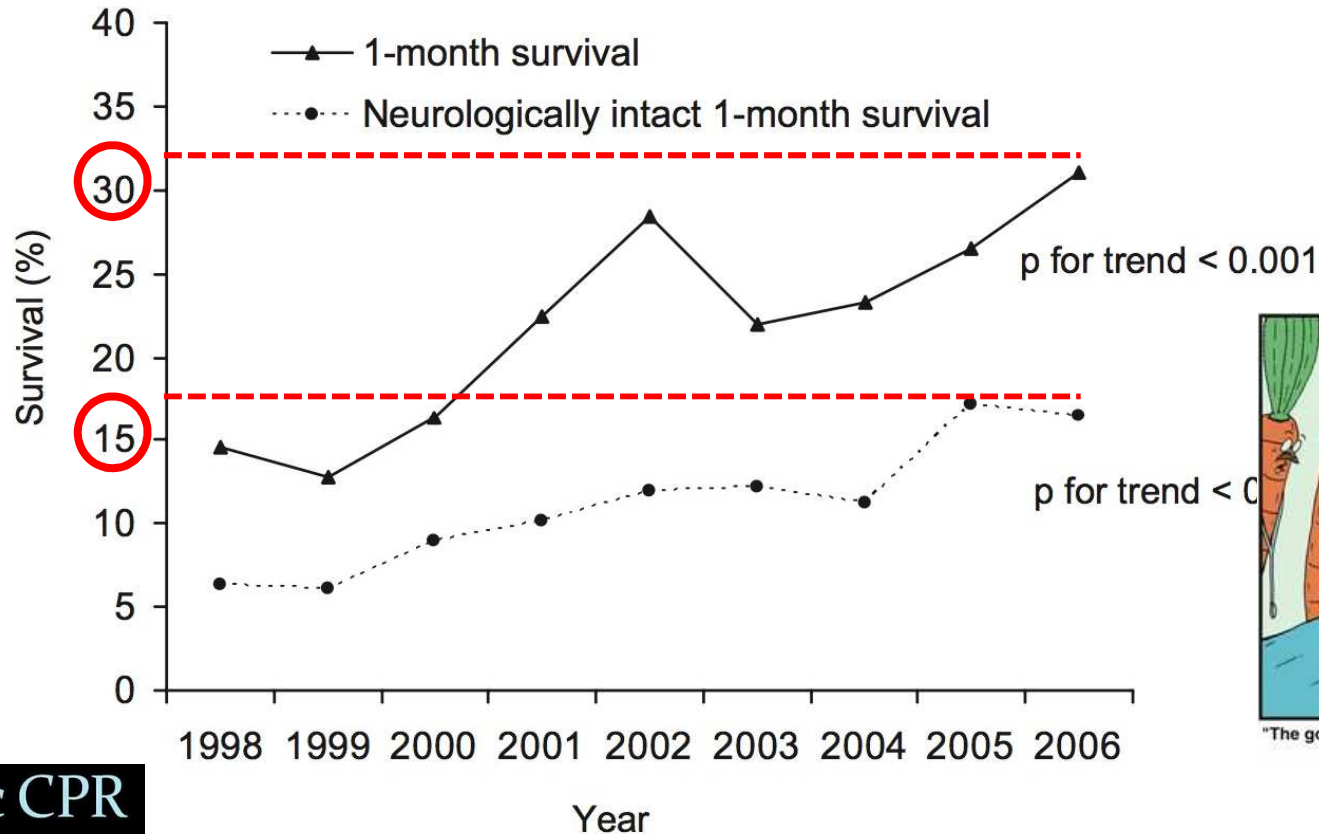
Dyslexic CPR



Amélioration de la prise en charge



Survie et pronostic neurologique post-ACR



"The good news is that he's in a permanent vegetative state."

Dyslexic CPR

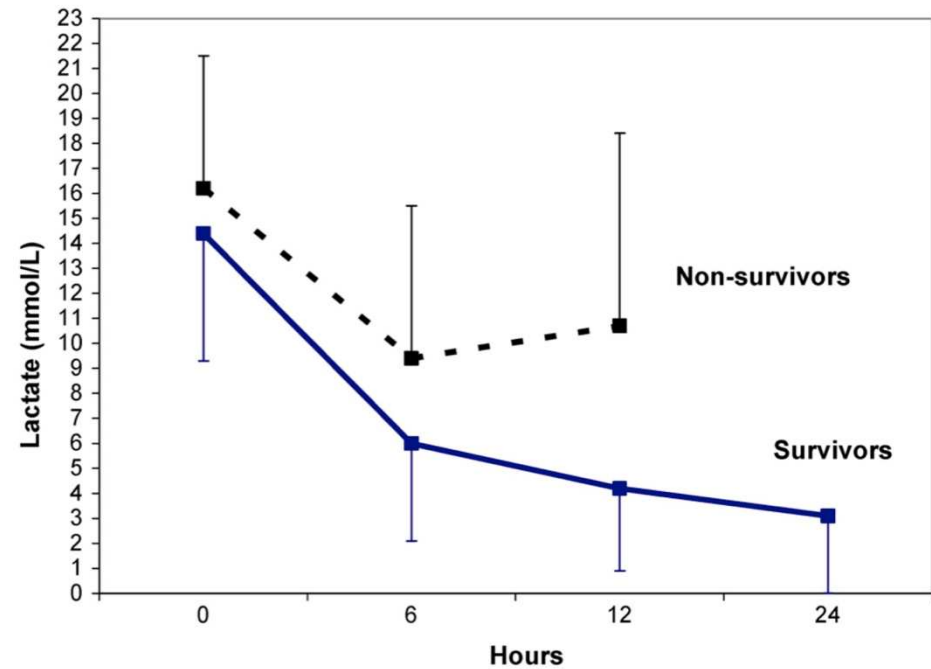
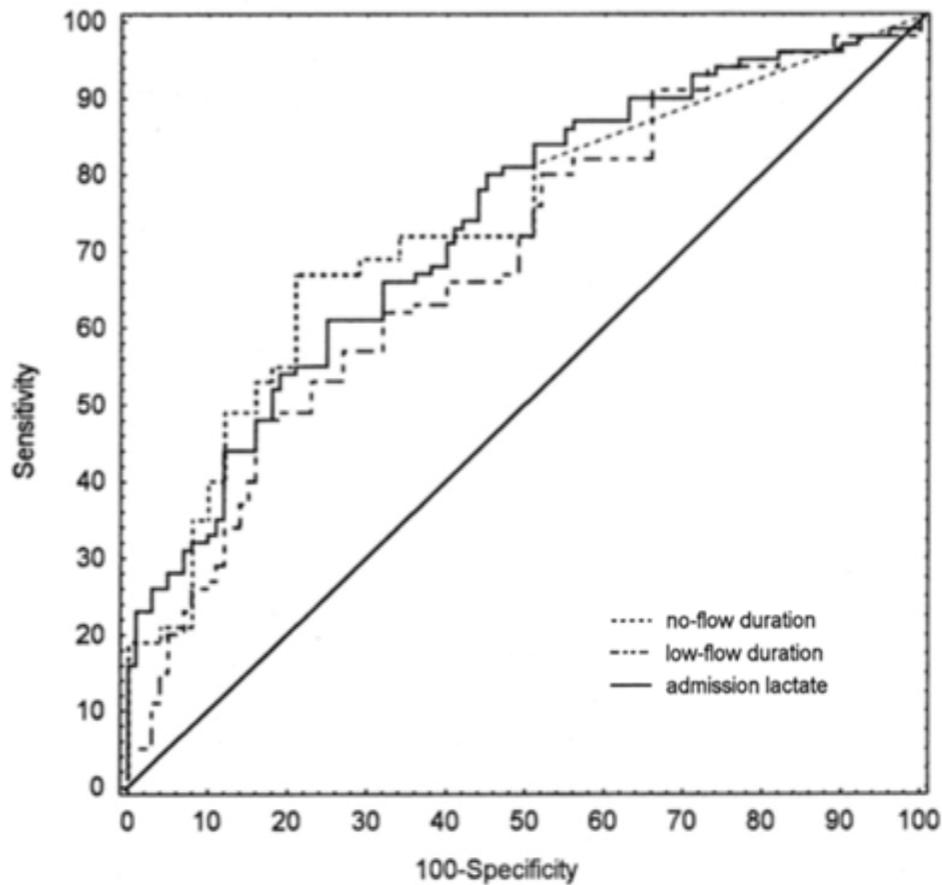


Amélioration de la prise en charge



Lactate et ACR

Le lactate: marqueur pronostique de l'ACR?



Müllner *et al.*, Intensive Care Med 1997

RESUSCITATION

Donnino *et al.*, Resuscitation 2007

Le lactate: marqueur pronostique de l'ACR?

First author, year [reference]	Number of patients	Study design	Initial minimum lactate for patient inclusion	Timing of measurements	Suggested time interval	Comments
Cardiac arrest						
Kliegel, 2004 [97]	394			24 h, 48 h	48 h	Persistent hyperlactatemia predictive of poor prognosis
Donnino, 2007 [98]	79	Retrospective			12 h	Decrease in lactate independent predictor of hospital survival
Arnalich, 2010 [99]	85	Prospective	-		h	Decrease in lactate significantly higher in 24-h survivors compared with nonsurvivors
Le Guen, 2011 [100]	51	Prospective	-	1 h		Increase in blood lactate significantly different in survivors and nonsurvivors
Starodub, 2013 [101]	199	Retrospective	-	6 h, 12 h, 24 h	12 h	Initial lactate level significantly associated with survival
Donnino, 2014 [102]	100	Prospective	-	12 h, 24 h	12 h	Greater percentage of survivors with lactate independently associated with survival
Riveiro, 2015 [103]	54	Prospective	-	6 h, 12 h, 24 h, 48 h, 72 h	6 h	Decrease in lactate predictive of 28-day survival
Williams, 2016 [104]	167	Retrospective	-	Variable	4 h	More rapid decrease in lactate in survivors

8 études
élimination du lactates / taux de lactates initial

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Prospective, multicentrique, observationnelle
Janvier 2012 → Mars 2013 - 67 services d'urgence (Japon)

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Critères d'inclusion

- ACR récupéré
- état général conservé avant ACR

Non-inclusion:

- ACR consécutif à certaines causes: dissection aortique, hémorragie cérébrale, hypoxie, traumatisme, overdose
- mesure du lactate peu fréquente

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Objectif:

Déterminer si l'élimination du lactate post ACR est associée
à la mortalité et au pronostic neurologique à J30
→ (lactate (H0) – lactate (H6)) / lactate (H0)

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CJP: Mortalité toute cause à J30

CJS: statut neurologique à J30 → cerebral performance category

Positive Outcomes

Negative Outcomes

Box. Cerebral Performance Category (CPC) Scale

CPC 1: Full recovery or mild disability

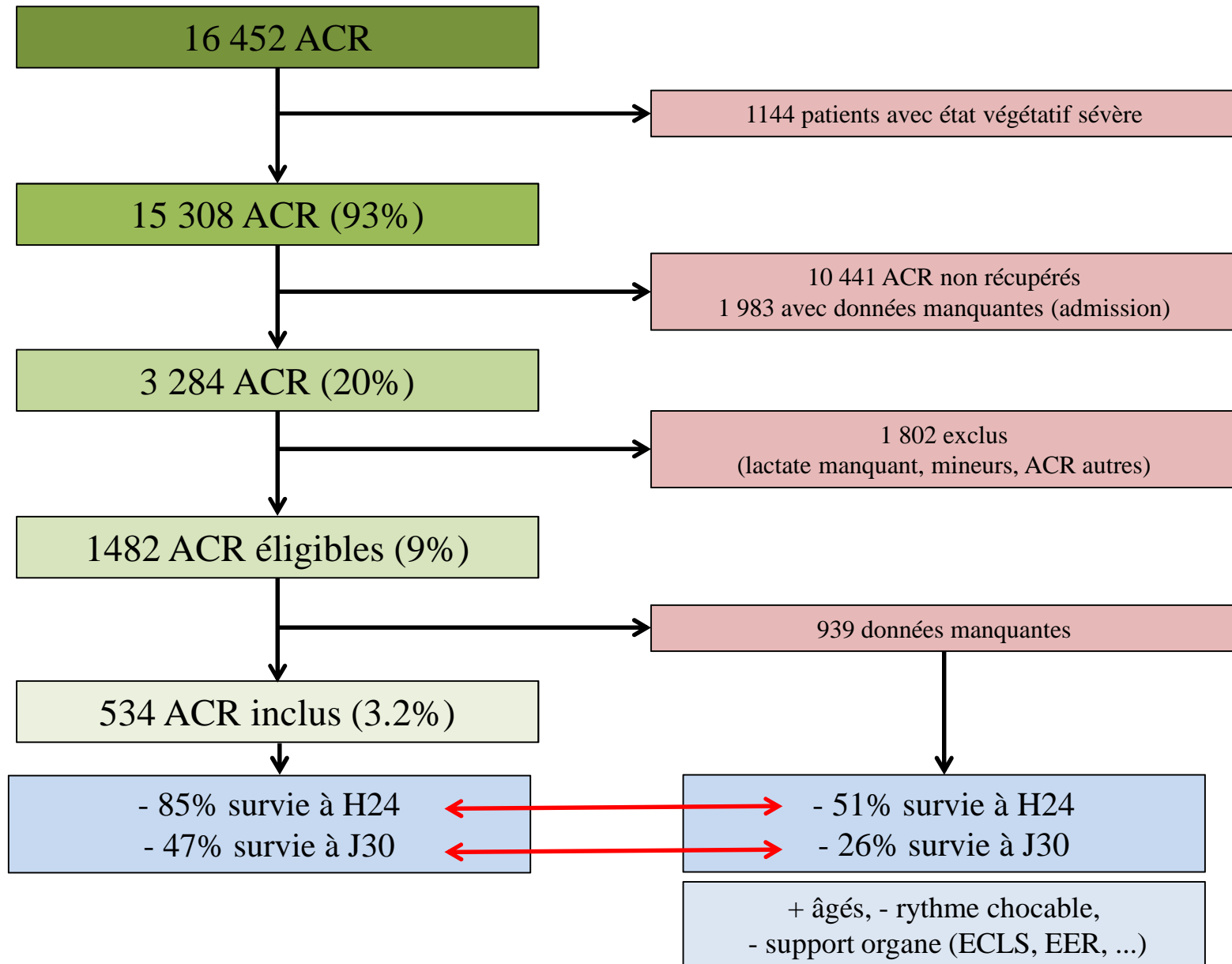
CPC 2: Moderate disability but independent in activities of daily living

CPC 3: Severe disability; dependent in activities of daily living

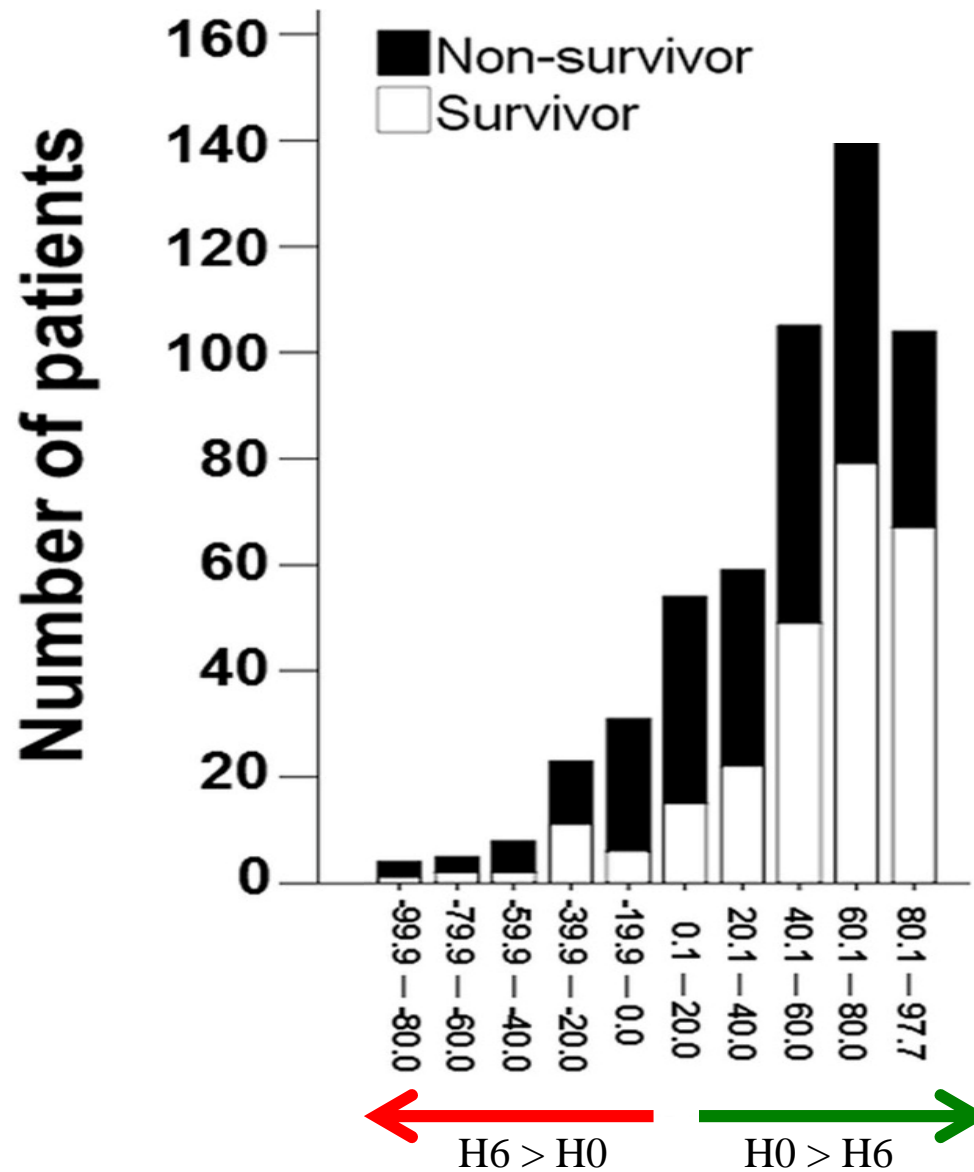
CPC 4: Persistent vegetative state

CPC 5: Dead

Flow chart



Elimination du lactate



Caractéristiques de la population

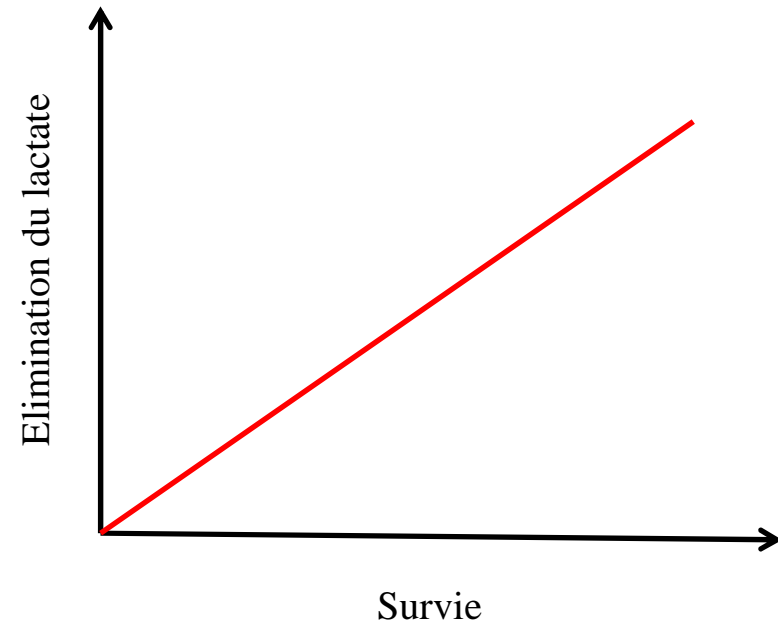
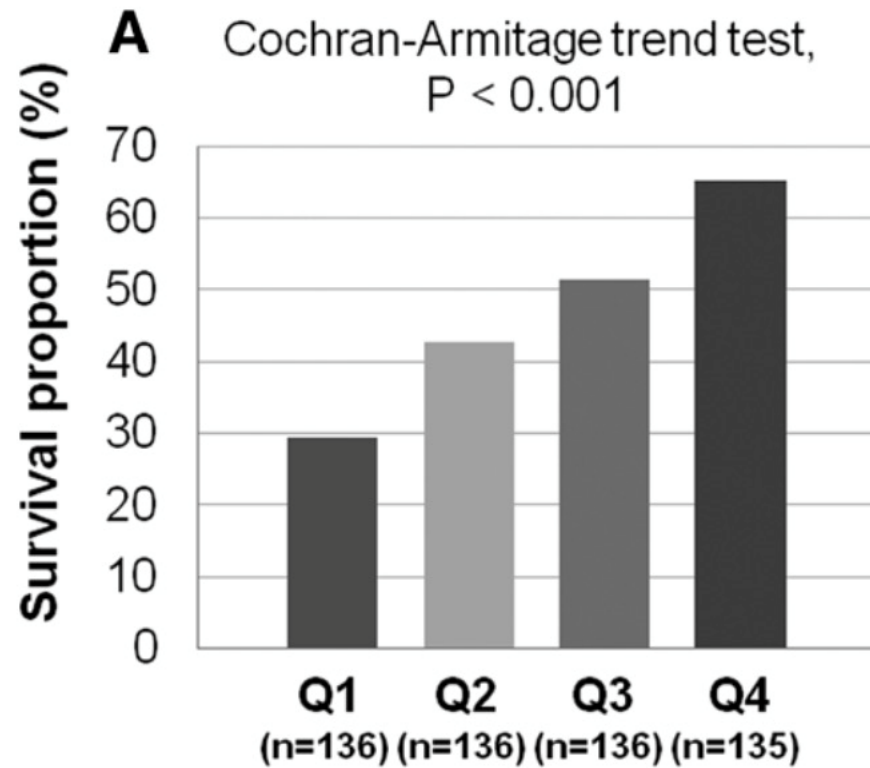
faible élimination

forte élimination

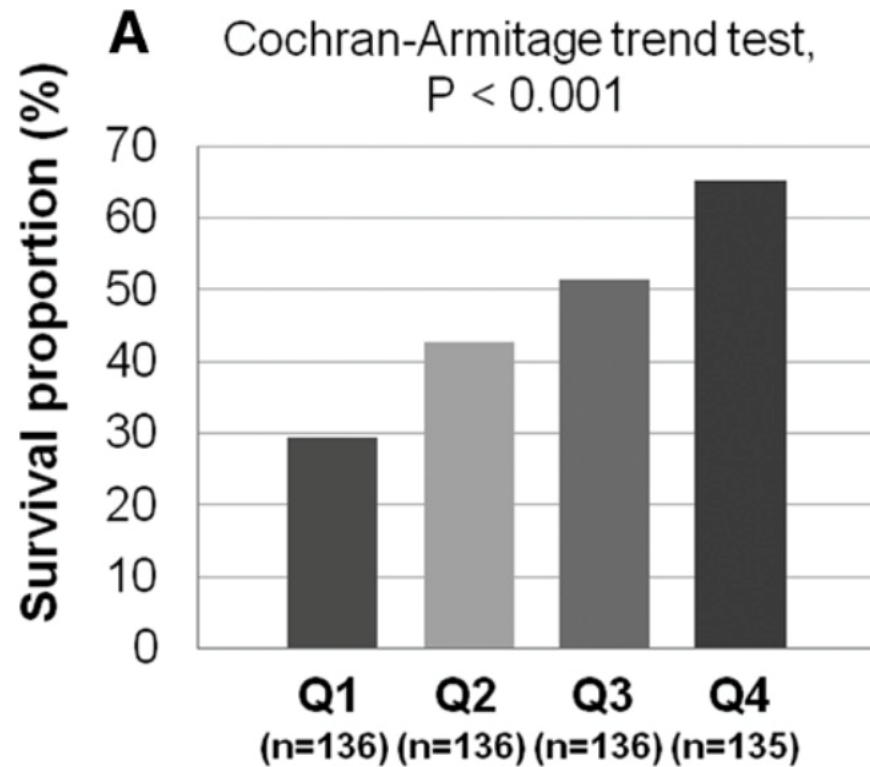
Variables	Quartile 1: LC ≤ 22.2% (n = 136)	Quartile 2: 22.2–56.8 (n = 136)	Quartile 3: 56.8–76.3 (n = 136)	Quartile 4: LC > 76.3% (n = 135)	p
Lactate clearance (%)	-23.0 ± 69.0	41.6 ± 10.2	67.1 ± 5.4	84.2 ± 5.0	-
Prehospital characteristics					
Age (yr)	69 ± 15	64 ± 14	62 ± 16	63 ± 18	0.002
Male sex	100 (73.5)	104 (76.5)	97 (71.3)	93 (68.9)	0.55
Preadmission functional status					
Witness	101 (74.3)	101 (74.3)	107 (78.7)	99 (73.3)	0.74
Cardiopulmonary resuscitation initiated by bystander	57 (41.9)	66 (48.5)	60 (44.1)	53 (39.3)	0.47
Cardiac etiology	103 (75.7)	111 (81.6)	105 (77.2)	99 (73.3)	0.43
Time from call to hospital arrival (min)	35 ± 12	35 ± 13	35 ± 11	33 ± 10	0.21
Return of spontaneous circulation prior to hospital arrival	35 (25.7)	59 (43.4)	52 (38.2)	60 (44.4)	0.005
Drugs and interventions after hospital arrival					
Epinephrine use during advanced cardiovascular life support	102 (75.0)	81 (59.6)	89 (65.4)	74 (54.8)	0.004
Steroids usage	1 (0.7)	2 (1.5)	1 (0.7)	1 (0.7)	0.90
Anticonvulsants	16 (11.8)	22 (16.2)	15 (11.0)	26 (19.3)	0.18
Antipyretics	6 (4.4)	9 (6.6)	3 (2.2)	11 (8.1)	0.14
Mechanical circulatory support	47 (34.6)	54 (39.7)	46 (33.8)	24 (17.8)	0.001
Therapeutic hypothermia	57 (41.9)	84 (61.8)	90 (66.2)	85 (63.0)	< 0.001
Renal replacement therapy	15 (11.0)	10 (7.4)	7 (5.1)	13 (9.6)	0.31
Lactate concentrations					
Lactate at hour 0 (mmol/L)	8.5 ± 5.6	9.6 ± 5.2	10.3 ± 4.6	11.0 ± 4.9	< 0.001
Lactate at hour 6 (mmol/L)	9.4 ± 6.0	5.7 ± 3.3	3.4 ± 1.6	1.7 ± 0.9	< 0.001

ical variables were presented as frequencies (%).

CJP: Survie à J30



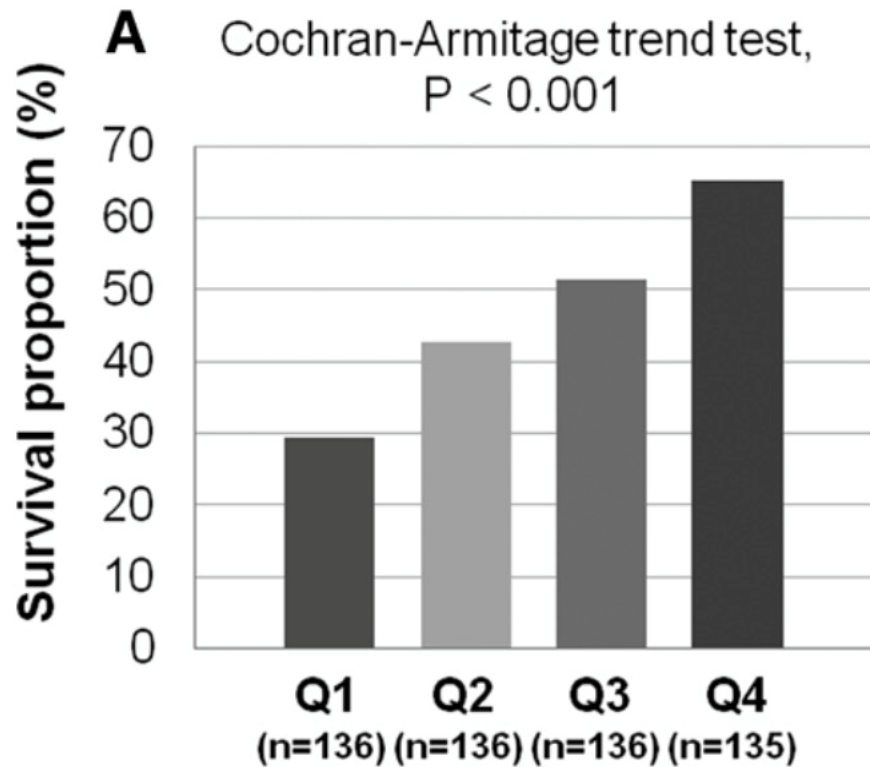
CJP: Survie à J30



Survival at 30 d After Hospital Admission

Univariate analysis	OR	95% CI	<i>p</i>
Quartile 1 (reference)	1.00	Reference	
Quartile 2	1.79	1.08–2.95	0.02
Quartile 3	2.55	1.55–4.19	< 0.001
Quartile 4	4.49	2.70–7.49	< 0.001

CJP: Survie à J30



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Quartile 4	4.49	2.70–7.49	< 0.001
Multivariate analysis	Adjusted OR	95% CI	<i>p</i>
Quartile 1 (reference)	1.00	Reference	
Quartile 2	1.56	0.82–2.92	0.17
Quartile 3	3.17	1.67–5.60	< 0.001
Quartile 4	6.67	3.37–13.20	< 0.001

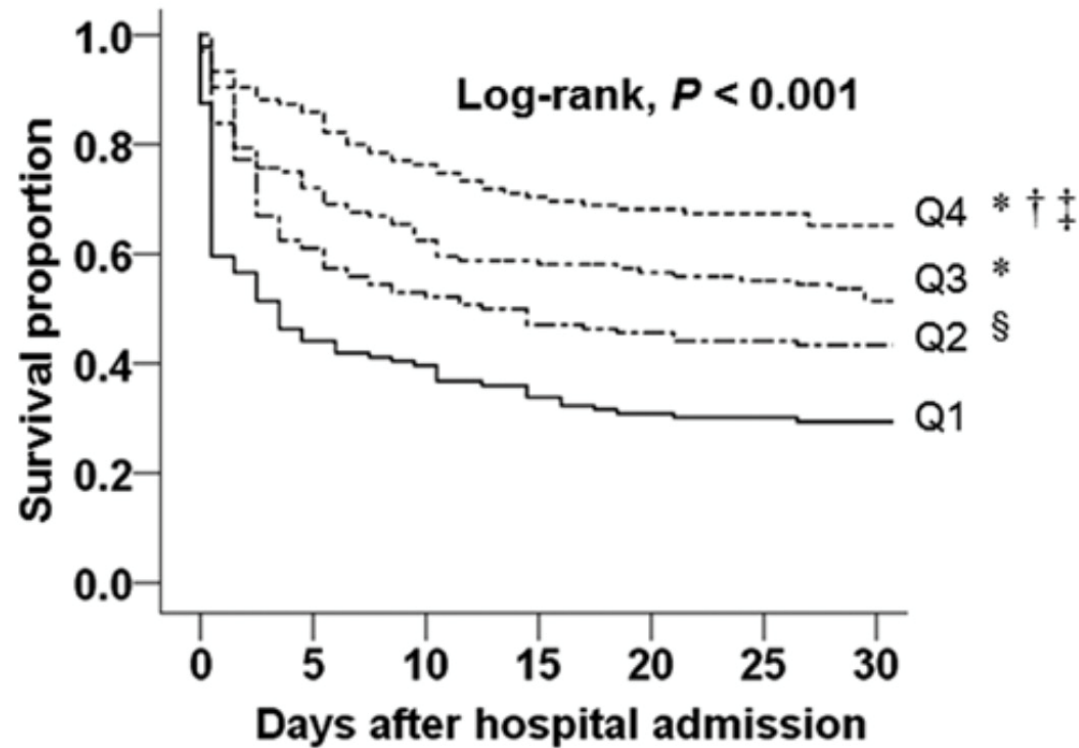
↓
élimination du lactate

=

marqueur indépendant de la survie

Cut-off	AUC	Sensibilité	Spécificité
51.8%	0.65	67%	57%

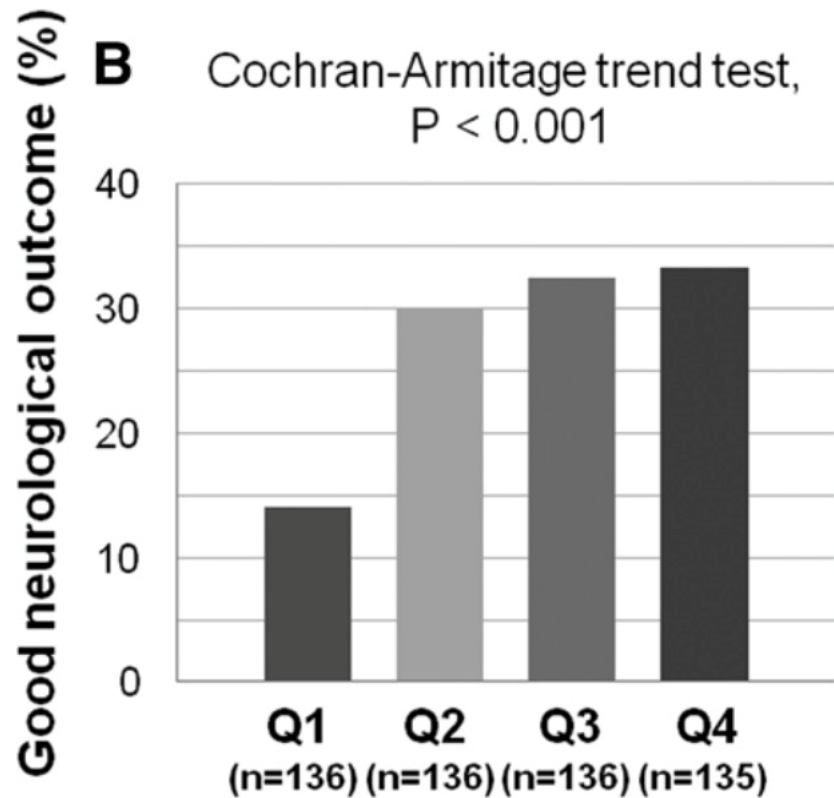
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Lactate at hour 6 (mmol/L)	9.4 ± 6.0	5.7 ± 3.3	3.4 ± 1.6	1.7 ± 0.9	< 0.001

Continuous variables were presented as mean ± sd. Categorical variables were presented as frequencies (%).

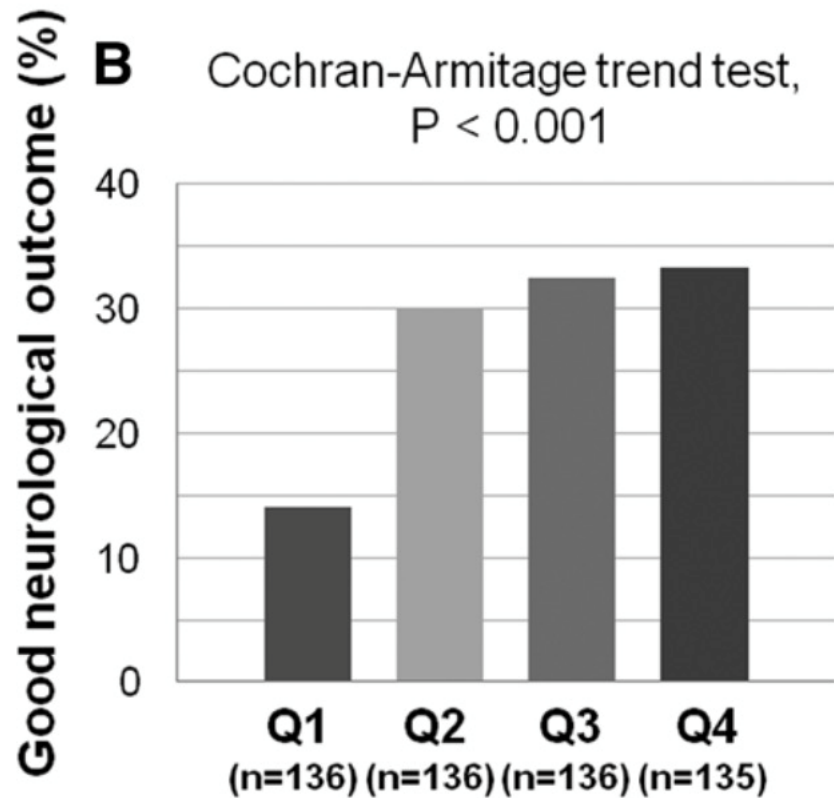
CJS: pronostic neurologique



Good neurologic outcome at 30 d after hospital admission

Univariate analysis	OR	95% CI	<i>p</i>
Quartile 1 (reference)	1.00	Reference	
Quartile 2	2.66	1.45–4.88	0.002
Quartile 3	2.95	1.61–5.38	< 0.001
Quartile 4	3.08	1.69–5.63	< 0.001

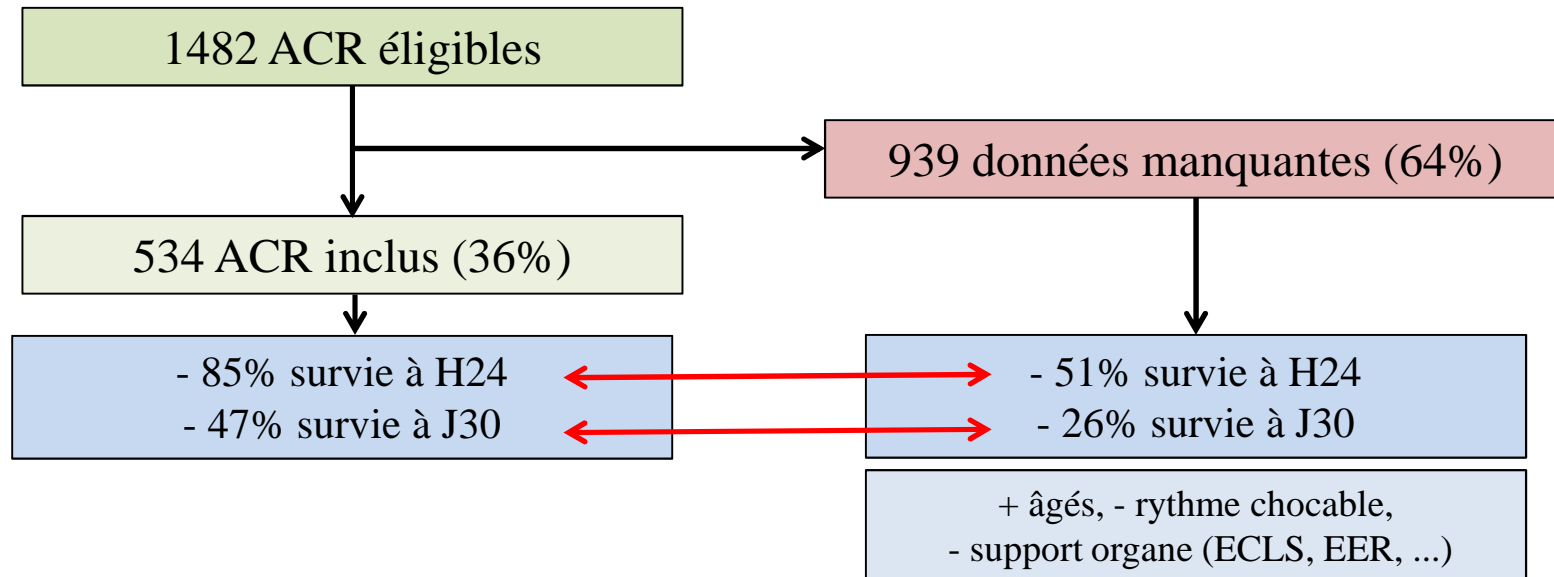
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Multivariate analysis			
	Adjusted OR	95% CI	<i>p</i>
Quartile 1 (reference)	1.00	Reference	
Quartile 2	3.10	1.44–6.67	0.004
Quartile 3	3.92	1.79–8.55	0.001
Quartile 4	4.54	2.00–10.34	< 0.001

Limites



- prospectif, observationnel, absence d'aveugle
- applicabilité

Messages clés