

respectively at 6 weeks for MACE. Table 1 demonstrates performance of risk scores at 6 weeks.

Table 1. Performance of risk scores at 6 weeks

	Low Risk				High risk				
	Type 1 MI		MACE*		Type 1 MI		MACE*		
	Sens	NPV	Sens	NPV	Spec	PPV	Spec	PPV	
HEART 0–3	0.990	0.998	0.976	0.994	HEART 7–10	0.953	0.621	0.956	0.654
TIMI 0–1	0.913	0.983	0.901	0.978	TIMI 5–7	0.971	0.488	0.973	0.536
GRACE <75	0.973	0.989	0.962	0.983	GRACE >140	0.874	0.316	0.882	0.372

*MACE = Composite of Type 1 MI, urgent unplanned coronary revascularisation (CABG, PCI, PPCI) and death.

Conclusion: HEART, incorporating HsTnT, outperforms GRACE and TIMI across all strata of risk using a range of performance indicators for risk score assessment.

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Heart rate during hypothermia therapy is an independent predictor of clinical outcomes in patients resuscitated from out-of-hospital cardiac arrest due to acute coronary syndrome

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Background: Bradycardia (<60 bpm) is a typical unfavorable side effect during therapeutic hypothermia (TH) in patients resuscitated from cardiac arrest due to acute coronary syndrome (ACS). However, the associations between heart rate (HR) during TH and patients' clinical outcomes are not well known.

Purpose: We investigated impacts of HR during TH on clinical outcomes after resuscitation, and whether bradycardia during TH was an unfavorable side effect in patients with cardiac arrest due to ACS.

Methods: Clinical data from 3,687 out-of-hospital cardiac arrest (OHCA) patients between October 2002 and October 2014 were retrospectively analyzed. Of 154 ACS patients underwent successful percutaneous coronary intervention, 85 patients performed TH (target temperature was 33–34°C, procedure time was 24–48 hours) were divided into two groups according to their mean HR during TH (lower HR group ≤75 bpm, higher HR group >75 bpm; the cut off value was median HR). In the present study, we evaluated about 1 year survival rate.

Results: Overall, 1 year survival rate was 40.0%. The mean HR during TH was 78.7 bpm. Lower HR group had 44 (51.8%) patients, including 18 (21.2%) bradycardia patients; all 18 patients did not received therapeutic interventions for bradycardia. When divided into two groups, patient's characteristics were not significantly different. However, 1 year survival rate in lower HR group was better than that of higher HR group (85.0% vs. 34.9%, $p < 0.001$). In univariate analysis, lower HR during TH, shorter time to return of spontaneous circulation, preserved left ventricular ejection-fraction (>40%), and better renal function were significantly associated with higher survival rate at 1 year. Furthermore, a multivariate analysis model which included these factors showed that lower HR was an independent predictor of higher survival rate at 1 year (Hazard ratio 5.56; 95% confidence interval [CI], 2.33–14.3; $p = 0.005$).

Conclusion: Lower HR during TH strongly predicted good clinical outcomes in patients resuscitated from OHCA due to ACS. Bradycardia during TH was a marker of favorable outcomes.

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Heart rate after resuscitation predicts clinical outcomes in patients with out-of-hospital cardiac arrest due to acute coronary syndrome

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Background: Previous studies have demonstrated that resting heart rate (HR) has powerful impacts on cardiovascular morbidity and mortality. Particularly, tachycardia is an independent predictor of higher mortality in patients with acute coronary syndrome (ACS). However, the impacts of HR on resuscitated patients from cardiogenic cardiac arrest are not well known, regardless of whether accompanying with ACS or not.

Purpose: We investigated the associations between HR and clinical outcomes after resuscitation from cardiogenic cardiac arrest.

Methods: This study was a prospective, multicenter (67 emergency hospitals), and observational study which enrolled 16,425 out-of-hospital cardiac arrest (OHCA) patients. Of them, we focused on resuscitated patients from cardiogenic OHCA and analyzed HR after resuscitation by 12-leads electrocardiogram (ECG) recorded in emergency rooms. Tachycardia was defined as HR >100 bpm and impacts of tachycardia on all-cause mortality at 3 months was surveyed.

Results: Overall, 997 patient's ECG after resuscitation were recorded in emergency room. Of them, 284 were determinately diagnosed with cardiogenic OHCA, including 168 ACS. Tachycardia was an independent predictor of 3 months mortality in cardiogenic OHCA patients (HR 2.68; CI, 1.04–6.92; $P = 0.041$) in a multivariate Cox regression model adjusting for age, gender, bystander cardiopul-

monary resuscitation, total epinephrine dosage, systolic pressure, left ventricular ejection-fraction, spontaneous breathing, and renal dysfunction. Furthermore, tachycardia was also an independent predictor of 3 months mortality in ACS patients (HR 4.37; CI, 1.01–19.1; $P = 0.049$), while the relationship between tachycardia and mortality was not shown in non-ACS patients ($n = 116$).

Conclusion: Tachycardia was an independent predictor of 3 months all-cause mortality in patients resuscitated from cardiogenic OHCA, especially due to ACS.

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Epidemiologic trends in an acute coronary unit: a 12 year report

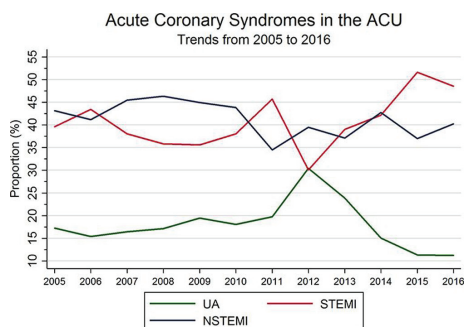
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Background: In the past 12 years there has been many advances in cardiovascular medicine. Management of acute coronary syndromes (ACS) has improved since the globalization of percutaneous coronary intervention (PCI), the enhancement of triage and referral systems to the emergency department and more recently with the application of high-sensitivity-troponin assays (hSTnI).

Purpose: We aim to describe trends and outcomes of ACS during a 12-year period in a single centre.

Methods: We retrospectively included 3545 patients that were admitted to our tertiary acute coronary unit (ACU) over a 12-year period (2005–2016) with a first diagnosis of acute coronary syndrome. We built a forecasting regression model to determine significant trends over time regarding baseline demographic characteristics, classification of acute coronary syndrome [ST elevation acute myocardial infarction (STEMI), non-STEMI (NSTEMI) and unstable angina (UA)] and main interventional strategy (PCI or coronary arterial bypass grafting, CABG).

Results: Mean age significantly decreased over the 12-year period (-0.25 years per year, $ptrend = 0.004$), while the proportion of males significantly increased (+7.5%, $ptrend = 0.002$). Prevalence of arterial hypertension did not change appreciatively over time (+1.6%, $ptrend = 0.302$), while both dyslipidemia (+18.2%, $ptrend < 0.001$) and type 2 diabetes mellitus (+6.6%, $ptrend = 0.042$) significantly increased. Proportion of STEMI in the cohort increased over time (+9%, $ptrend = 0.013$), while NSTEMI significantly decreased, albeit to a smaller degree (-2.9%, $ptrend = 0.038$), as depicted in the figure. Although the overall rate of UA did not significantly change ($ptrend = 0.561$), after the introduction of hSTnI assays in our institution (since 2014), a 12.7% decrease was observed ($ptrend = 0.014$). Death during admission to the ACU remained stable over the follow-up period (-1.1%, $ptrend = 0.189$). The rate of PCI markedly and significantly increased (+19.5%, $ptrend < 0.001$), while the rate of CABG did not change over time (-0.7%, $ptrend = 0.321$).



Acute Coronary Syndromes in the ACU

Conclusions: Epidemiology in the ACU significantly changed over a 12-year period, with a small trend towards younger, male patients and an increase in the proportion of STEMI. Introduction of hSTnI resulted in a decrease of UA admissions. Overall, death during admission did not change significantly. As expected, a remarkable growth in the rate of PCI was found.

P2722 | BEDSIDE

Comparison of a new cardiac electrical biomarker and the spatial QRS-T wave angles in the detection of acute myocardial ischemic injury

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Background: A new cardiac electrical biomarker (CEB™), constructed from the derived 12-lead electrocardiogram (dECG), has been identified with high diagnostic accuracy in the detection of acute myocardial ischemic injury (AMI). The spatial peak (spQRS-T α) and spatial mean (smQRS-T α) angles are electrical parameters used to assess cardiac repolarization abnormalities and are constructed from the derived vectorcardiogram XYZ leads (dVCG).

Objective: Compare the CEB™ (VectraCor, Inc., Totowa, NJ) with the spQRS-T α and smQRS-T α in the detection of AMI.

Methods: This is an exploratory case control study of 123 patients including 16 patients with AMII. Each patient had a dECG and dVCG constructed from a 3 lead set of the acquired measured 12-lead ECG (mECG). The dECG was used to construct the CEB™. The dVCG lead voltage-time data was used to construct the spQRS-T α and smQRS-T α . All ECGs were interpreted by blinded cardiology and emergency medicine specialists to assess AMII and Non-AMII. Sensitivity and specificity parameters were used to assess diagnostic accuracy. Pearson r was used to assess agreement between mVCG and dVCG leads.

Results: The dVCG showed high correlation with the mVCG. Pearson r was 0.887 (0.853, 0.921; 95% CI), 0.957 (0.946, 0.968; 95% CI), and 0.805 (0.76, 0.85; 95% CI) for VCG leads X, Y, and Z respectively. The median CEB™ for AMII and non-AMII cases were 224 and 35 respectively, with mean CEB™ of 343.2 (165.8, 520.6; 95% CI) and 55.9 (44.7, 67.0; 95% CI). The CEB™ sensitivity and specificity was 87.5% and 84.0% respectively (Fisher Exact Test; p=0.0000). The median smQRS-T α for AMII and Non-AMII cases were 98.3° and 93.9° respectively, with means 93.4° (86.4°, 100.5°; 95% CI) and 92.0° (90.0°, 94.0°; 95% CI) respectively. The median spQRS-T α was 57.4° for both AMII and non-AMII cases. The spQRS-T α means for AMII and non-AMII were 57.8° (57.2°, 58.4°; 95% CI) and 57.48° (57.41°, 57.55°; 95% CI) respectively. The sensitivities of the SM QRS-T α and spQRS-T α were 0.563 and 0.25 respectively, with specificities of 0.528 and 0.729 respectively.

Conclusions: The VCG leads can be accurately derived from a 3 lead set of the standard 12-lead ECG. The CEB™ was able to distinguish AMII from non-AMII with high diagnostic accuracy. Neither the smQRS-T α nor spQRS-T α were able to accurately detect AMII. Further studies are needed to validate these results.

P2723 | BEDSIDE

Presentation at admission and in-hospital evolution of patients with myocardial infarction with non-obstructive coronary arteries and its impact on prognosis

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Background: Myocardial Infarction with Non-Obstructive Coronary Arteries (MINOCA) accounts for up to 10% of patients admitted for myocardial infarction in a cardiology department. The objective of this study is to analyze the clinical profile at admission and in-hospital evolution of MINOCA patients (pts).

Methods: Analytical and observational study developed in a University Hospital, which covers 220.000 individuals. We analyzed clinical, analytical and electrocardiographic data of 63 consecutive MINOCA pts admitted to our center during two years. Median follow up was 9 months. This group was compared with 84 consecutive patients diagnosed of myocardial infarction (MI) related to obstructive coronary arteries during the last 6 months of 2016 in the same hospital. We used the definitions and the clinical management of 2016 ESC Working group position paper on MINOCA.

Results: Pts with MINOCA presented with chest pain in a similar proportion of those with obstructive lesions (82.5% vs 83.3%). There was less proportion of pts with ST depression in MINOCA pts (4.8 vs 19.1%, p<0.01), but pathological negative T wave was more frequent (33.3 vs 19.5%, p<0.05). There were no statistical differences in the rate of presentation with normal ECG (15.9 vs 10.7%, p 0.25) or ST elevation (31.7 vs 34.5%). Laboratory findings showed marked differences: the average Troponine I (TnI) in pts with obstructive lesions was 31.2±5.8 ng/ml, in contrast with the MINOCA group: 8.3±2 ng/mL (p<0.01), as well as Creatinine Kinase (CK): (949±164 U/L vs 581±194.9 U/L, p<0.05). C-reactive protein (C-RP) was higher in pts with MINOCA (41.2±9.1 mg/L vs 25.3±6 mg/L, p<0.05). The average cardiac frequency at admission was higher in MINOCA pts (93±3.6 lpm vs 80.6±1.8 lpm, p<0.01). The presentation with a Killip-Kimball class worse than II was similar (7.9 v 9.5%).

During hospitalization or admission, major in-hospital complications were similar between MINOCA and obstructive MI pts: mortality (0% vs 2.4%), hospital re-MI (6.5% vs 7.3%), pulmonary oedema (8 vs 12%), heart arrest (3.2% vs 1.2%), stroke (1.6 vs 2.4%) nor cardiogenic shock (6.5% vs 8.5%). Only in-hospital major bleeding showed a trend to be minor in the MINOCA pts (1.6% vs 2.4%, p=0.12). Mortality and re-MI at the end of follow-up were 00% and 00% in MINOCA pts. Re-admission was linked to ST elevation at presentation (p<0.05), higher levels of CK (p<0.01) and Creatinine (p<0.05). Worse functional class was in relation with higher levels of TnI (p<0.01), C-RP (p<0.01) and Cr (p<0.01) at admission.

Conclusion: There are differences in the clinical presentation of MINOCA pts, mainly in ECG pattern and biomarkers levels. The in-hospital evolution of MINOCA pts is not so benign as it was thought, with no significant differences in the rate of complications compared to the obstructive group. Further studies are necessary to generate a new approach in these pts.

P2724 | BEDSIDE

Inhospital mortality in patients with infarct-related cardiogenic shock undergoing coronary angiography treated with and without acute revascularization therapy

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Background: An early invasive strategy is recommended in patients with cardiogenic shock caused by an acute myocardial infarction. Little is known about the fate of patients undergoing angiography and not treated with acute revascularization therapy in real life.

Methods: We analysed data of the prospective ALKK-angiography registry containing all diagnostic procedures of 41 hospitals Patient characteristics, indications for coronary angiography, treatments and in-hospital outcomes were prospectively collected and centrally analysed. In this analysis we included all patients undergoing angiography for cardiogenic shock.

Results: Between 01/2009 and 12/2013 a total of 2818 patients with myocardial infarction related cardiogenic shock underwent angiography within 24 hours after onset of symptoms. Of these 251 (8.9%) had not acute revascularization therapy, 2514 (85.9%) PCI and 152 (4.2%) coronary artery bypass graft surgery. The patient characteristics and anatomical findings at coronary angiography are given in the table.

Table 1

	No acute revascularization	PCI	CABG
Patients	251	2514	152
Age (years)	72.4	69.8	71.0
Women	27.5%	28.9%	27.6%
Prior MI	49.5%	32.3%	25.4%
Prior CABG	28.3%	8.2%	2.1%
Prior PCI	38.7%	20.1%	13.9%
CAD 1	33.2%	21.4%	10.9%
CAD 2	12.9%	25.9%	10.9%
CAD 3	53.9%	52.7%	78.2%
Left main disease	14.4%	20.6%	58.9%
Mortality	47.8%	42.0%	21.7%

Conclusions: In clinical practice the majority of patients undergoing angiography for infarct related cardiogenic shock is treated with PCI. In selected patients, especially those with left main disease and 3-vessel disease urgent CABG is preferred and associated with a favourable mortality.

P2725 | BENCH

Description of acute cardiac care in 2014: A French nation-wide database on 277,845 admissions in 270 ICCUs

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Background: The Intensive Cardiac Care Unit (ICCU) has greatly evolved for decades: it is no longer only patients with coronary artery disease (CAD). The clinical characteristics and pathological profiles of patients have markedly changed. Detailed data on the topic are critically lacking.

Methods: We present here a French nation-wide database with an exhaustive description of patients admitted into the ICCU throughout a whole year (2014).

Results: A total of 277,845 patients in 270 centers were admitted at least one time in the ICCUs in 2014 (exhaustive data). Median age was 71 years (IQR: 59–81) and the patients were primarily male (63%). The mean stay in the ICCUs was 2.0 d (1.0–4.0). CAD patients (49.0%) represented the major group admitted, followed by patients with arrhythmias (15.2%) and heart failure (HF) (10.0%). Patients admitted with acute CAD were significantly younger (mean age 67.4 y), had better outcomes (mortality 4.0%), and shorter hospital stays (mean stay 6.7 d). Patients with HF were significantly older (mean age 75.2 y), with longer hospital stays (mean stay 12.0 d), and poorer outcomes (mortality 10.5%).

Multivariate analysis (logistic regression) of prognostic factors of in-hospital mortality among patients admitted for the same diagnosis

Variables	Adjusted ORs	95% CI	p (Wald χ^2)
Age (≥ 71 versus < 71 years old)	2.522	2.413–2.635	<0.0001
Acute coronary syndrome (yes versus no)	1.193	1.146–1.243	<0.0001
Acute heart failure (yes versus no)	2.880	2.771–2.992	<0.0001
Heart rhythm disorder (yes versus no)	1.908	1.835–1.984	<0.0001
Centers' size			<0.0001
Q1 ≤ 610 admissions	0.975	0.921–1.032	
Q2 ≤ 836 admissions	0.913	0.867–0.961	
Q3 ≤ 1171 admissions	0.873	0.833–0.915	
Q4 > 1171 admissions	1		

Conclusion: We present here the largest contemporary database on patients admitted into the ICCUs in a developed country. There is a strong need for improved