

Conclusions: Detection of T wave changes prior to VT/VF might be useful in predicting imminent arrhythmia occurrence. T wave amplitude is higher and T wave slopes are steeper before ventricular arrhythmia compared to baseline, without significant shortening of different repolarisation times.

	baseline	apnoeas	p ^a
T amplitude (mV)	1,6 ± 0,9	2,2 ± 0,7	0,04
R peak to T peak (ms)	314 ± 54	296 ± 54	0,06
T max ascending slope (mV/ms)	0,094 ± 0,013	0,093 ± 0,023	0,05
R peak to T max ascending slope (ms)	263 ± 63	236 ± 44	0,08
T max descending slope (mV/ms)	0,021 ± 0,007	0,021 ± 0,018	0,01
R peak to T max descending slope (ms)	306 ± 45	324 ± 58	0,7
T wave area (mV x ms)	6,5 ± 5,1	8,3 ± 7,8	0,2
T duration (between points of max slopes) (ms)	98 ± 49	102 ± 59	0,2
T duration (between crossing isoelectric line) (ms)	185 ± 89	184 ± 86	0,9
R peak to T end (ms)	428 ± 88	409 ± 102	0,3
T peak to T end (ms)	313 ± 104	295 ± 82	0,2

T wave parameters at baseline and before VT/VF

204

Overdrive ventricular pacing in patients with permanent atrial arrhythmias and sleep apnea

Philippe Bordier (1), S. Maurice-Tison (2)

(1) Hôpital cardiologique du Haut Leveque, Pessac, France – (2) INSERM U897, Université Bordeaux II, Bordeaux, France

Background: In contrast to its efficacy in patients with heart failure (HF) and central (C) sleep apnea (SA), cardiac pacing is ineffective in obstructive SA. We examined whether overdrive ventricular pacing (OVP) has an effect on SA in pacemaker recipients with permanent atrial arrhythmias.

Methods: An apnea-hypopnea index (AHI) ≥ 15 was confirmed in 28 of 38 patients screened by finger oximetry during ventricular pacing at a backup rate of 40 bpm (BUV40). These 28 patients were randomly assigned in a crossover design to BUV40 versus OVP at 20 bpm above the mean heart rate measured during screening oximetry.

Results: AHI ≥ 30 and CSA were observed in 61% and 79% of patients, respectively. In 21 patients (19 with CSA) with a ≥ 5 OVP-induced decrease or no change in AHI, left ventricular ejection fraction (LVEF) was $40 \pm 16\%$, versus $55 \pm 18\%$ ($p=0.04$) in 7 patients (3 with CSA, $p=0.02$) with a ≥ 5 OVP-induced increase in AHI. In 13 patients with histories of HF decompensation, AHI decreased from 32.8 ± 12.9 during BUV40 to 24.9 ± 16.5 during OVP, versus increased from 37.6 ± 11.0 to 39.0 ± 11.5 in 15 patients without histories of HF decompensation ($p=0.02$ vs. patients with histories of decompensated HF). In 9 patients with LVEF $\leq 35\%$, AHI decreased from 37.3 ± 14.7 during BUV40 to 28.4 ± 17.9 during OVP, versus from 34.5 ± 10.7 to 34.4 ± 14.3 in 19 patients with LVEF $> 35\%$, ($p=0.04$ vs. patients with LVEF $\leq 35\%$).

Conclusions: In patients with permanent atrial tachyarrhythmias, AHI decreased significantly during OVP in patients with a) histories of decompensated HF and CSA, or b) LVEF $\leq 35\%$, and increased or was unchanged by OVP in patients without these characteristics.

205

ST segment changes after external cardioversion using direct current shock: incidence, characteristics and predictive factors

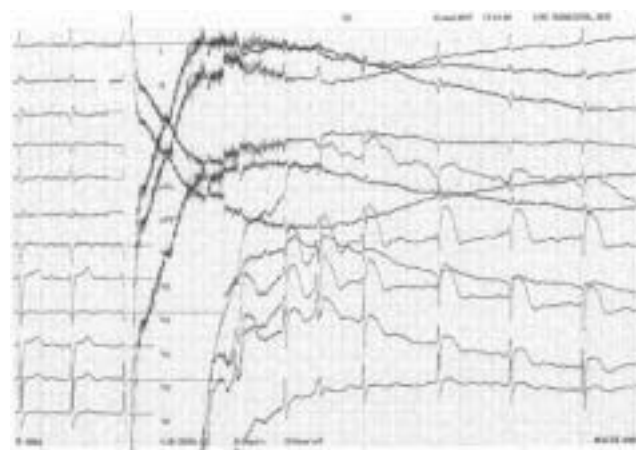
Philippe Rumeau, Philippe Maury, Joëlle Fourcade, Alexandre Duparc, Pierre Massabuau, Aurélien Hebrard, Pierre Mondoly, Anne Rollin, Didier Carrie, Michel Galinier, Marc Delay
CHU Toulouse Rangueil, Fédération de Cardiologie, Toulouse, France

Introduction: DC shock is commonly used for external cardioversion of cardiac arrhythmias. Incidence, characteristics and predictive factors of transient ST-segment changes after DC shock are poorly known.

Methods: 91 consecutive pts referred for external cardioversion of atrial fibrillation (AFib) (61 men, 69 ± 10 yo) were prospectively included. Duration and amplitude of ST elevation or depression were quantified on 12 lead-ECG immediately after the first DC shock. Correlations with DC shock characteristics clinical variables, underlying heart disease, echocardiographic parameters, biological parameters, medications, anesthetic drugs as well with morphological features were made.

Results: 18 and 20 pts underwent 200 J or 300 J monophasic and 53 pts 200 J biphasic DC shocks. Immediate success rate was 95%. We found an incidence of 48 % for ST segment changes: 35 % for ST elevation (0.81 ± 0.44 mV) and 13 % for ST depression (0.2 ± 0.07 mV, $p < 0.0001$). ST changes were essentially seen in the right precordial leads. Major ST elevation was observed in 27 % which could sometimes display Brugada-like pattern. ST changes durations were similar for ST elevation and ST depression (60 ± 43 vs 50 ± 26 sec, $p=ns$) and were correlated to the amplitude of ST changes. ST changes did not induce significant cardiac events or alter immediate or late AFib recurrences. ST changes were not related to energy but ST elevation was significantly more often induced by monophasic (76 % vs 6 %, $p < 0.0001$) and ST depression by biphasic DC shocks (26 % vs 3 %, $p=0.01$). Using multivariate analysis, independent predictors for ST elevation were the use of monophasic DC shocks, use of propofol and increased CRP, while a low ejection fraction and use of biphasic DC shocks were independent predictors of ST depression.

Conclusion: ST segment changes after external cardioversion with DC shock are common, short living and do not seem to carry clinical significance. They are related to the monophasic or biphasic configuration of DC shock, to the use of propofol, to the ejection fraction and to an increased CRP. Direct membrane injury by electroporation is suspected.



206

The time course of new T-wave ECG descriptors following single and double dose administration of Sotalol in healthy subjects

Fabrice Extramiana (1), Rémi Dubois (2), Pierre Roussel (2), Martino Vaglio (3), Gerard Dreyfus (2), Fabio Badilini (3), Antoine Leenhardt (1), Pierre Maison-Blanche (1)
(1) Hôpital Lariboisière, Département de cardiologie, Paris, France – (2) ESPCI ParisTech, Laboratoire d'électronique, CNRS UMR 7084, Paris, France – (3) AMSP LLC, New York, Etats-Unis

Introduction: The aim of the study was to assess the time course effect of IKr blockade on ECG biomarkers of ventricular repolarization and to

evaluate the accuracy of a fully automatic approach for QT duration evaluation.

Methods: 12-lead digital ECG Holter were recorded in 38 healthy subjects (27 males, mean age=27.4±8.0 years) on baseline conditions (day 0) and after administration of 160 mg (day 1) and 320 mg (day 2) of d-l Sotalol. For each 24-hour period and each subject, ECGs were extracted every 10 minutes during the 4-hour period following drug dosage. Ventricular repolarization was characterized using 3 biomarker categories: conventional ECG time intervals, Principal Component Analysis (PCA) analysis on the T-wave, and fully automatic biomarkers computed from a mathematical model of the T-wave.

Results: QT interval was significantly prolonged starting 1h20 minutes after drug dosing with 160 mg and 1h 10 minutes after drug dosing with 320 mg. PCA ventricular repolarization parameters sotalol-induced changes were delayed (>3 hours). After sotalol dosing, the early phase of the T-wave changed earlier than the late phase prolongation. Globally, the modeled surrogate QT paralleled manual QT changes.

The duration of manual QT and automatic surrogate QT were strongly correlated ($R^2=0.92$, $p<0.001$). The Bland & Altman plot revealed a non-stationary systematic bias (bias =26.5ms ±1.96*SD = 16ms).

Conclusions: Changes in different ECG biomarkers of ventricular repolarization display different kinetics after administration of a potent potassium channel blocker. These differences need to be taken into account when designing ventricular repolarization ECG studies.

207

Incidence and clinical significance of the association of paroxysmal supraventricular and ventricular tachycardia

Béatrice Brembilla-Perrot, Jean Marc Sellal, Nicolas Sadoul, Hugues Blangy, Arnaud Terrier De La Chaise, Olivier Claudon, Olivier Selton, Pierre Louis, Laurent Groben, Pierre Yves Zinzus, Lucian Muresan, Sonia Magalhes, Fabrice Duhoux, Karim Djaballah, Leice Darwiche
CHU of Brabois, Cardiologie, Vandoeuvre Les Nancy, France

Fine-QRS complex tachycardia alternating with wide-QRS complex tachycardia can lead to an erroneous diagnosis of paroxysmal supraventricular tachycardia (SVT) with or without aberrancy. The purpose of the study was to evaluate the incidence and the significance of the association of SVT and ventricular tachycardia (VT) in the same patient.

Population: 898 patients aged from 11 to 88 years were consecutively admitted for a sustained VT; 818 patients had associated heart disease (history of myocardial infarction 374, idiopathic dilated cardiomyopathy 69, arrhythmogenic right ventricular dysplasia 86, miscellaneous 289) and 80 had no apparent heart disease.

Methods: Electrophysiological study including programmed atrial and ventricular stimulation, 2D cardiac echocardiography, coronary angiography in patients older than 40 years, right ventricular angiography and cardiac RMI since 2002, were performed in these patients.

Results: Fifteen patients presented (2 %) with either SVT or VT. All SVT's were related to an atrioventricular node reentrant tachycardia (AVNRT). The association of SVT and VT was significantly more frequent in patients without heart disease and with verapamil-sensitive VT (n=6/80, 7.5 %)($p<0.001$), arrhythmogenic heart disease (n=4/86, 5 %)(0.05) than in those with myocardial infarction (n=4/374, 0.1 %) or dilated cardiomyopathy (n=0). Among 692 patients with AVNRT, 39 had associated heart disease and only 5 have both tachycardias. Radiofrequency ablation of AVNRT performed in all patients did not change the recurrence of VT which required ablation in 3 patients and the implantation of antiarrhythmia device with defibrillator in 2 patients.

Conclusion: The association of SVT and VT is rare in patients with heart disease except in those with arrhythmogenic right ventricular dysplasia. The association is more frequent in patients without heart disease diagnosis and could be underestimated; fine QRS complex tachycardia alternating with wide QRS complex tachycardia leads generally to the erroneous diagnosis of SVT with or without aberrancy.

208

Long-term effects of implanted cardioverter defibrillators appropriate and inappropriate shocks, mortality and hospitalization

Gwénaëlle Lhéritier (1), Anahita Kowsar (2), Henri Bonhabau (3), Patrick Blanc (4), Patrice Viot (4)
(1) CHRU Dupuytren, Réanimation, Limoges, France – (2) Clinique du Colombier, cardiologie, Limoges, France – (3) Faculté de médecine, Limoges, France – (4) CHRU Dupuytren, cardiologie, Limoges, France

Implantable cardioverter defibrillator (ICD) is the gold standard therapy for patients at high risk for ventricular tachyarrhythmias in secondary and primary prevention.

Patients with an ICD implanted for primary or secondary prevention were selected from a single-center registry between Jan99-Dec 08. 359 pts (312 men, age 63±12.4years) received consecutively 432 ICD. Among them 217 (60%) have an ischemic heart disease. It was a primary indication in 30% and a secondary in 70% of cases. 72 pts (22%) received one or more appropriate shock and 27% efficacy antiarrhythmia pacing. Secondary indication (RR=7.8; 95%CI: 2.63-23.25), treatment with amiodarone (RR=2.5; 95%CI: 1.34-4.99) and low left ventricular ejection fraction LVEF (<30%) (RR=1.9; 95% CI: 1.02-3.64) predicted appropriate shock occurrence. There were 63 deaths. Heart failure is the major event for hospitalization and remained the predominant mode of death. Predictors of mortality in multivariate modeling included LVEF, increasing age and the use of another treatment than beta-blocker single use. One or more appropriate shock seems to promote the mortality.

During the follow up, complication occurred in 33% of cases: one or more inappropriate shock n =58 (16%), 36 leads dislodgment, 28 haematomas, 8 infections, 7 leads failure, 4 device failure, 2 pneumothorax, 2 subclavian thrombosis and 7 others.

Prior atrial fibrillation (RR=2.2; 95% CI: 1.12-4.32) and a secondary indication (RR=2.83; 95% CI: 1.27-6.30) predicted inappropriate shock occurrence. The incidence of inappropriate interventions was not dependent on the type of ICD (VVI vs. DDD).

Conclusions: Infection can be the most important complication, leading to the system removal. Inappropriate ICD shocks are common adverse consequences that may impair quality of life, may cause hospitalizations and limit cost-effectiveness. Preventive measures are required to optimize quality of life of patients with ICD.

209

How automatic algorithms are used in daily medical practice in dual chamber pacemaker recipients? Intermediate results from a prospective registry

Pierre Le Franc (1), Jacques Casassus (2), Karim Bel Hadj (3), Olivier Bizeau (4), André Guillemot (5), Jean-Luc Rey (6), Nicolas Delarche (7), Pierre Bienvenu (8), Olivier Gartenlaub (9), Laure Coutrot (10)
(1) Clinique Saint Hilaire, Rouen, France – (2) Clinique Cardiologique, Aressy, France – (3) Clinique Louis Pasteur, Essey Les Nancy, France – (4) Hôpital La Source, Orleans, France – (5) Hôpital Général, Dinan, France – (6) Hôpital Sud, Amiens, France – (7) Hôpital Général, Pau, France – (8) Centre Hospitalier, Laval, France – (9) Clinique A. Brillard, Nogent Sur Marne, France – (10) Boston Scientific France, Montigny-Le-Bretonneux, France

Objective: Automatic algorithms in pacemakers (PM) allow continuous adaptation of settings to patients' clinical conditions. Some are dedicated to pacing and others to sensing. One of the objectives of BELUGA on-going, international, prospective registry was to evaluate the use of automatic algorithms available in Insignia™ PM in current medical practice.

Methods: The percentage (%) of activation of atrio-ventricular search hysteresis algorithm (AVSH), dynamic AV delay (DynAVD), automatic atrial/ventricular sensing (AAS/AVS), ventricular automatic capture (VAC) and the % of use of automatic ventricular threshold test during patients assessment