Free papers

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BRUGADA SYNDROME/ARVD/WPW

Brugada syndrome: the "Piemonte" Registry experience

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BACKGROUND. Brugada syndrome is one of the most intriguing issues in clinical electrophysiology. In spite of the great interest that the study of this syndrome has created in the last 10 years (since the first description as a new entity in 1992), still questions remain open. In this setting, risk stratification of asymptomatic patients and the role of the electrophysiologic (EP) study remain a big hurdle. The aim of our study is to collect data of patients with Brugada syndrome, managed with a standardized protocol, especially regarding EP study.

METHODS. Patients referred to the Cardiology Division in the "Piemonte" area, with ECG signs of Brugada syndrome (type 1) in basal conditions or after i.v. flecainide, were included in the present Registry. In this setting, both retrospective and prospective data were collected. History and familial history (with complete family pedigree) were collected and clinical and instrumental evaluation, including echocardiogram, Holter monitoring, signal-averaged-ECG, ergometric test, cardiac magnetic resonance, EP study were performed. EP study was performed with basal recordings and programmed stimulation from two right ventricular sites (apex and outflow tract), at two basal pacing cycle lengths with up to two extrastimuli to the ventricular refractory period. If no arrhythmia was inducible and basal ECG was not a type 1, programmed stimulation was repeated after flecainide infusion. Patients symptomatic for syncope or cardiac arrest and asymptomatic patients who were inducible at programmed ventricular stimulation underwent automatic defibrillator implantation (ICD).

RESULTS. Fifty patients were referred. Data from 26 patients were analyzed in a retrospective way, while 24 patients were enrolled in a prospective way. The mean follow-up was 20 ± 15 months for retrospective patients and 10 ± 10 for prospective patients. EP study was performed in 41 patients (82%). Of the patients who underwent EP study, 19 (46%) were inducible for ventricular arrhythmias, 10 (52%) of them were symptomatic: 8 (42%) for syncope and 2 (10%) for resuscitated cardiac arrest, 6 (32%) patients were symptomatic for vasovagal syncope, while 3 (16%) patients were asymptomatic. In 22 (54%) patients ventricular arrhythmias were not induced at programmed stimulation: 3 (25%) of them were symptomatic for syncope and 1 had experienced a resuscitated cardiac arrest, 10 (46%) patients suffered from vasovagal syncope, while 8 (36%) patients were asymptomatic. Twenty patients underwent ICD implantation. At follow-up 3 patients had an appropriate ICD shock, all of them had sustained ventricular arrhythmia induction at EP study.

CONCLUSIONS. The "Piemonte" Registry experience allowed us to collect homogeneous data from a population of Brugada patients. These preliminary results are in agreement with the results reported in the literature. A longer follow-up period for prospective patients is required for further clinical implications.

Brugada syndrome in infancy: incidence and problems of clinical management

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The incidence and natural history of Brugada syndrome in the pediatric population is not known: although symptoms generally occur in adult life, sudden death in

infancy cannot be excluded. Infant cases reported are a few and regard the most symptomatic patients, therefore to observe a Brugada type ECG in infancy implies important problems of clinical management.

From May 2001 to June 2003, 853 infants and children referred to a pediatric hospital for other reasons than heart disease, were consecutively analyzed by the same cardiologist with the intention to consider mild and changeable ECG abnormalities too. The diagnosis was made in 4 patients (0.47%):
- 9 years, female, who had a pre-syncope; the ECG showed a spontaneous "coved type" pattern. Positive resulted not only the ECG of her asymptomatic mother but also of her 78-year maternal grandfather who showed a basal 4 mm ST-segment elevation; he is alive, although having experienced an unexplained syncope 25 years before. Being the tilt test resulted negative a programmed ventricular stimulation (PVS) was performed and an unsustained ventricular tachycardia (VT) induced. SCN5A mutation did not result at the genetic screening. Twenty-five months later she is well;
- 3 years, male, whose sleep had been disturbed by dyspnea and signs of hypotension. ECG became clear only by prolonged monitoring. No relative has evident ECG signs, but some doubts remain for one. PVS induced sustained VT; H-V conduction time resulted prolonged. A loop recorder implantation has been proposed;
- 4 years, male, asymptomatic, but with a "coved type" ECG and many sustained runs of ectopic junctional tachycardia at Holter monitoring. A further investigation was not accepted by his parents;
- 4 years, male, completely asymptomatic; the ECG showed a spontaneous "coved type" abnormality, but was normal in all the examined family members.

Conclusions. Brugada syndrome is not very rare in children and the diagnosis may be confirmed by ECG monitoring and family members evaluation, but the deep uncertainty of prognosis makes very difficult the approach of the family. Provocative tests and reveal implantation should be considered for the symptomatic cases, in order to gather data for risk stratification, keeping in the meantime the therapy the most conservative as possible.

Uncommon arrhythmia in the so-called Brugada syndrome: the sustained ventricular tachycardia

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Case report. T.F. (24 years) came to the hospital because of palpitations occurred at rest. Physical examination was normal. The electrocardiogram showed a ventricular tachycardia with a rate of 200 b/min, left bundle branch block morphology and superior axis. The first emergency echocardiogram showed a normal left ventricular chamber size with a preserved ejection fraction (55%). The patient was treated with intravenous xylocaine, followed by DC-shock. The basic electrocardiogram showed a right bundle branch block with ST-segment elevation in leads V_1 trough V_2, and monomorphic ventricular premature beats. The laboratory examinations did not show any significant alterations. A brief clinical history revealed that the patient had been evaluated for ventricular arrhythmias and the presence of structural and kinetic alterations localized in the free wall of the right ventricle, was previously identified. The nuclear magnetic resonance had shown only a thinning of the free wall of the right ventricle near the apex. Late potentials study was positive. Exercise stress test did not induce any anomaly. The angiographic study of the right ventricle confirmed the right ventricular wall motion abnormality. At electrophysiologic study the HV interval was prolonged. Ventricular arrhythmias were not induced. The patient was treated with beta-blockers and is still asymptomatic at 3 years of follow-up. His brother has a similar ECG pattern but no arrhythmias. His mother has a similar ECG as well.

Comments. This syndrome, first described by Nava-Martini-Thiene 5 years before Brugada, is usually characterized by polymorphic ventricular arrhythmias. In rare reports however patients with this syndrome present a sustained ventricular tachycardia, always with a left bundle branch QRS morphology. These arrhythmias are always due to an anatomical reentry circuit, and not to a functional anomaly.

Atrial fibrillation and Brugada syndrome: the "Piemonte" Registry experience

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Objectives. The aim of this study was to evaluate the incidence of atrial arrhythmias in a population of Brugada patients.

Background. Patients with Brugada syndrome present an abnormal electrophysiologic substrate which predisposes them to the risk of sudden death due to ventricular fibrillation. Recently few manuscripts have been published which report that Brugada patients have a higher incidence of atrial fibrillation too. From the other side, genetic and molecular studies have permitted, in recent years, to identify a subpopulation of patients with idiopathic familial atrial fibrillation, who present genetic abnormalities often involving cardiac channel proteins.

Methods. Fifty patients with Brugada syndrome were referred to a registry which collected data from consecutive Brugada patients from the Cardiology Divisions of the "Piemonte" area.

Results. All patients presented a structural normal heart. Eleven out of 50 (22%) presented a history of

paroxysmal or persistent atrial fibrillation: 3 patients had electrocardiographic signs of Brugada syndrome (type 1) after flecainide assumption for prophylaxis of atrial fibrillation recurrences. The mean age of atrial fibrillation presentation was 50 ± 10 years.

CONCLUSIONS. Patients with Brugada syndrome, either symptomatic or not for syncope and cardiac arrest, present a higher incidence of atrial fibrillation, at a younger age as compared to healthy subjects. These findings, according to recent studies, suggest that these patients would present an electrophysiologic abnormality expressed both in the atrium and ventricular myocardium.

Long-term follow-up of signal-averaged ECG in arrhythmogenic right ventricular cardiomyopathy

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PURPOSE OF THE STUDY. The aims of our study were to evaluate late potentials changes during a long-term follow-up in patients with arrhythmogenic right ventricular cardiomyopathy (ARVC), and to correlate these results with echocardiographic findings and sustained ventricular tachycardia (VT) occurrence.

METHODS. We studied 31 patients (22 males, 9 females) with a mean age of 29 ± 16 years. All of them were followed for 8 years, with visits every 2 years. At each control they underwent signal-averaging ECG (SAECG), and echocardiography.

RESULTS. The SAECG parameters showed a progressive significant increase of late potentials during follow-up (Table). On the contrary, echocardiographic indexes did not evidence relevant modifications. Ten patients with sustained VT were characterized by longer values of filtered QRS at 25/40/80-250 Hz filters (124.8 vs 135.7; 116.9 vs 130.3; 105.4 vs 118.4; $p < 0.05$), and longer HFLA at 25-250 Hz (24.3 vs 37.1; $p < 0.01$), at baseline examination.

	Baseline	2 yrs	4 yrs	6 yrs	8 yrs	p
25-250Hz						
FQRS (ms)	128.4 ± 14	131.4 ± 17	130.9 ± 17	132 ± 15	135.7 ± 17	<0.0002
HFLA (ms)	28.4 ± 13	28.9 ± 15	30.6 ± 17	33.1 ± 14	35.6 ± 19	<0.001
RMS (ms)	53.9 ± 52	37.7 ± 25	45.1 ± 44	38 ± 33	34.4 ± 24	<0.02
40-250Hz						
FQRS (ms)	121.2 ± 17	124.9 ± 19	124.8 ± 19	125 ± 16	128.7 ± 19	<0.001
HFLA (ms)	41.5 ± 16	45.6 ± 20	46.1 ± 18	47.4 ± 16	49.4 ± 17	<0.005
RMS (ms)	26.9 ± 19	21.2 ± 16	21.0 ± 15	18.8 ± 15	18.3 ± 13	<0.0005
80-250Hz						
FQRS (ms)	109.6 ± 15	111.7 ± 16	111.9 ± 16	113.2 ± 15	115.7 ± 17	<0.001
HFLA (ms)	40.5 ± 17	43.6 ± 16	43 ± 16	44.2 ± 16	48 ± 18	<0.01
RMS (ms)	15.5 ± 15	13 ± 11	13.7 ± 15	11 ± 10	9.3 ± 6	<0.005

CONCLUSIONS. We detected a progressive increase of delayed ventricular conduction by SAECG not associated with significant echocardiographic changes. Therefore, the conduction disturbance seems to increase independently of anatomical alterations. The baseline SAECG appears to be useful in identifying patients prone to sustained VT.

Radiofrequency catheter ablation in Wolff-Parkinson-White athletes

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Risk of sudden cardiac death in Wolff-Parkinson-White syndrome (WPW) is difficult to establish, even if evidence data suggest that the overall risk is low. On the other hand, sudden death has been reported as the first event in WPW asymptomatic subjects, in the course of physical activity. This event had been related to the increased adrenergic state induced by exercise, which is able to shorten refractoriness in the accessory pathway and which may increase atrial and ventricular irritability. Clinical examination, exercise and electrophysiologic testing allow an assessment of arrhythmic risk pathways. Radiofrequency catheter ablation (RFCA) has been recognized as a safe treatment of symptomatic WPW subjects. Based on a subjective benefit-to-risk analysis, asymptomatic WPW individuals should undergo catheter ablation only under special circumstances (high risk profession, athletes, family history of sudden death). This technique is effective in 80% to 98% of cases and it is influenced by the number and location of accessory pathways and the experience and volume of the center involved. Minimal risk of < 1% and approximately 5% of late recurrence of conduction are reported, but more data need to assess the follow-up in athletes.

A group of 84 consecutive athletes with WPW (aged 12-62 years, mean age 27 ± 12 years) were evaluated by cardiac non-invasive and electrophysiologic testing. Forty of them (47%) were high conditioned athletes, and 35 of all athletes (41%) were symptomatic for palpitations or syncope. A subgroup of 49 athletes (58%) underwent RFCA. A follow-up of 2 to 7 years was done in all subjects.

No sudden death was found. Relapsing supraventricular tachycardias were found in 4 (5%) of all ablated athletes.

In conclusion, RFCA has become a safe and effective procedure for treatment of WPW children and adult athletes.

CARDIAC PACING

Ventricular arrhythmia, pacing and sensing episodes in assessment of ACTROS memory data

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The aim of this study was to evaluate the accuracy of an implanted Biotronik ACTROS D (DDD) pacemaker memory data (HP) in the estimation of pacing and sensing episodes and single ventricular extrasystole beats (VEB).

MATERIALS AND METHODS. Thirty-eight patients (20 males, 18 females) aged 35-76 years (average 68 years),

implanted with Biotronik ACTROS D pacemaker were studied. Twenty-four-hour Holter ECG (HM) using Oxford Medilog System with simultaneously restarting pacemaker's statistics functions (PH): event counter, activity report and ventricular extrasystolic statistic were performed in each patient. Comparison of the following events: atrial sense (As), atrial pace (Ap), ventricular sense (Vs), ventricular pace (Vp), VEBs and mean heart rate (HR mean) was performed.

RESULTS. The results are shown in the table. Student's t-test was used for statistical analyses.

	Vs (%)	Vp (%)	As (%)	Ap (%)	VEB/24h	HR mean
PH	9.1 ± 13	90.9 ± 14	43.1 ± 37.8	56.9 ± 38	443.3 ± 960	81.3 ± 2.7
HM	9.1 ± 14	90.9 ± 14	43 ± 3	56.7 ± 38	187.5 ± 385	81.4 ± 2.6
p	0.89	0.98	0.82	0.388	0.08	0.89

CONCLUSIONS. 1) No significant differences between values of As, Ap, Vs, Vp and HR mean retrieval from PH and HM were found. 2) Although the number of single VEBs assessed by PH was higher than in HM, the difference was not statistically significant. However, the usefulness of VEB count evaluation by PH in clinical practice seems to be limited.

What is the best pacing rate for the reduction of tachy-atrial fibrillation episodes. Long-term results

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Continuous ventricular overdrive pacing in patients with chronic atrial fibrillation (AF) has a stabilizing effect on the usually irregular and random ventricular rhythm during AF. This effect was shown in some previous studies, though they have not investigated the efficacy during daily activity and over a long period of follow-up (FU).

The aim of this study was to assess the data of heart rate histograms from the diagnostic pacemaker memory in the reduction of fast ventricular rates over 88 b/min (defined as tachy-AF) in patients with different pacing rate during a long-term period of 3 months.

METHODS. Forty-four patients with a mean age of 72.2 years with AF and permanent VVI pacing (Biotronik ACTROS S) were enrolled into the study. The pacemaker memory data from 3-month FU with following pacing rate VVI 60/min; VVI 70/min; VVI 80/min were compared with each other and with data from 1-day FU – basic rate 40/min for intrinsic ventricular rate recording.

RESULTS. We found a significant lower percentage of tachy-AF episodes ($p < 0.05$) during every pacing rate comparing to VVI 40/min in: VVI 40/min = 23.3 ± 18%, VVI 60/min = 19.6 ± 16%, VVI 70/min = 18.1 ± 14.3, VVI 80/min = 12.1 ± 11, at 3-month FU. There were no significant differences between VVI 60/min, VVI 70/min in the reduction in tachy-AF. Pacing VVI 80/min provides significant reduction in tachy-AF episodes comparing to VVI 40/min, VVI 60/min and VVI 70/min during long-term FU ($p < 0.05$).

CONCLUSIONS. 1) The decrease in the number of tachy-AF episodes during different pacing rates comparing to intrinsic ventricular rate in AF was found. 2) VVI 80/min provides a 2-fold reduction of tachy-AF comparing to other pacing rates during long-term FU and maybe such pacing rate should be recommended in patients with AF.

Upgrade of single-chamber pacemakers with transvenous leads to dual-chamber pacemakers in pediatric and young adult patients

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PURPOSE. Children with single-chamber pacemakers (PM), in adolescence and young adulthood, may be upgraded to dual-chamber systems, but there are no published data about indications, timing, and complications.

METHODS. Since 1993, upgrading was attempted in 22 patients with transvenous pacing leads. A retrospective analysis of all collected data was performed.

RESULTS. At initial PM implantation (mean ± SD, 8.3 ± 4.1 years), pacing mode was VVIR (n = 17 patients) and AAI/AAIR (n = 5). After 7.3 ± 4.3 years of follow-up, at the age of 14.9 ± 4.7 years, upgrade was undertaken for age at elective generator replacement (n = 2 patients), ventricular dysfunction (n = 7), syncope (n = 3), lead malfunction (n = 5) in patients with VVIR pacing; atrioventricular block (n = 2) and/or drug refractory supraventricular tachyarrhythmias (n = 4) in patients with AAI/R pacing. In comparison with single chamber PM implantations, the average procedure time and fluoroscopy time were not significantly longer. PM implanted are: 7 Inos 2 CLS, 4 AT 500, 4 K VDD 701, 3 Thera, 1 K 901, 1 Minuet, 1 Philos. All suitable preexisting leads were incorporated in the new pacing system, 5 malfunctioning ventricular leads were abandoned. Leads were inserted via the ipsilateral subclavian vein in 19 patients, via the contralateral in 2. Venous occlusion was found in 2 patients: in the first the procedure was not performed, in the other, the contralateral vein was used and the old lead was abandoned. There was one procedure-related complication, early dislodgement of an atrial lead that was repositioned. During a follow-up of 1.4 ± 1.1 years, ventricular dysfunction worsened in 5 of 7 patients; other patients benefited symptomatically.

CONCLUSIONS. Pacemaker upgrade is technically challenging but feasible and safe and may be beneficial for some patients. Venous occlusion is the major limiting factor.

Atrial tachyarrhythmias and atrioventricular delay optimization: the MATE study

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Atrial fibrillation is the most common atrial arrhythmia. Its consequences are the result of hemodynamic alterations due to the loss of atrial systole, particularly in the presence of underlying structural heart disease, and thromboembolic events, most often cerebral, with serious functional sequelae resulting in increased morbidity and mortality and thus high health care costs. For these reasons efforts are fully warranted to try to prevent this disorder. Autonomic nervous system plays a role in the onset of atrial fibrillation; heart rate variability (HRV) is the marker of its response on cardiac activity. The HRV mode switching algorithm included in ELECT D pacemaker checks PNN50 (percentage of spontaneous atrial events whose period differs from the previous one more than 50 ms) and evaluates and classifies each event, with respect to the rhythm, as normal or abnormal distinguishing between physiological increase of the atrial rate and atrial tachycardias. The aim of MATE study is to demonstrate that the total number of atrial arrhythmia episodes is significantly reduced when combining an optimal atrioventricular delay (optimization of hemodynamic function) with HRV mode switching algorithm in comparison with standard pacing and nominal atrioventricular delay. This protocol is an Italian multicenter prospective, randomized study with five single-blind branches. All eligible patients will be followed during 12 months. The patient inclusion should occur within the month following the pacemaker implantation. The design of the study includes two phases. The total number of inclusion is determined in 270 patients for respect of statistical analyses.

Biatrial pacing for recurrent atrial arrhythmias. Long-term experience in 18 patients with inverted split BP biatrial pacing system

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The role of intra- and interatrial conduction disturbances (IACD) in the pathogenesis of atrial arrhythmias has been proved. Electrophysiological and clinical effects of right atrial pacing (RAP) are rarely considered, and most of patients with brady-tachy syndrome and IACD receive right atrial-based pacing system which can aggravate arrhythmias. Biatrial (BiA) pacing stays accepted mode for prevention of reentrant atrial arrhythmias.

Eighteen patients received modified split BP (SBP) pacing system with cathode connected to ring of the BP CS lead. Subacute (1 week), and chronic (1-3-6 months) pacing thresholds (PTh) were acceptable both in UP CS and BiA pacing program. Due to significantly higher resistance on BiA than on RA and on ring UP CS, values of energy consumption were acceptably higher in BiA. Pacing or mixed problems were noted in 5.5% of RAA leads and 11% of CS leads (RAA exit block-5.5%; CS exit block-5.5% and dislocation-5.5%).

	RA			CS			BiA		
Month of FU	1	3	6	1	3	6	1	3	6
PTh(V)	0.6	1.2	0.8	2.9	3.4	3.0	4.3	4.9	4.5
Impe.(ohm)	476	495	483	556	580	564	940	1129	988
Energ.cons.uJ	5.4	7.1	5.8	19.1	22.3	20.2	23.7	25.9	24.6

	Antiarrhythmic effect of BiA pacing		
Months of observation	1	3	6
Excellent (no arrhythmias) %	59	60	57
Good (decreased no. of arrhythmias) %	21	28	29
Week or no effect %	20	12	14

CONCLUSION. 1) The proposed SBP BiA pacing system show acceptable effectiveness and satisfied clinical effects. 2) BiA pacing is very promising mode for suppression of atrial arrhythmias. 3) The PTh and energy consumption are quite acceptable.

Late pacemaker pocket erosion: epidemiologic analysis in a region of North-Western Italy (Piemonte)

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Pacemaker pocket erosion is still a relevant clinical problem as it may be the cause of septicemias and/or endocarditis with consequent poor prognosis. True incidence of this complication is rather variable in the various series of cases reported in the literature with a range from 0.9 and 20% when early infective complications are included.

In order to evaluate the real incidence of this complication we have performed a retrospective analysis on the data coming from all pacemaker implanting centers in Piemonte. Data collection forms were completed for each patient presenting with this kind of complication from 1996 through 1998; the follow-up lasted for at least 24 months.

RESULTS. In the 21 centers (81% of all pacemaker implanting centers in Piemonte) in which complete data were collected, 7793 pacemaker and 289 automatic cardioverter-defibrillator implants were performed. During the follow-up 100 cases of pacemaker pocket erosion were observed with a total incidence of 1.28% (range from 0 to 3.1%); no cases of cardioverter-defibrillator pocket erosion were reported. Diabetes mellitus was

the most frequent associated disease (25% of patients), about 30% of patients were in treatment with antiplatelet drugs. The kind of surgical procedure performed to resolve the problem was different in the various centers according to personal experience and to the various evaluations performed by each physician.

CONCLUSIONS. Our study demonstrates that the overall incidence of late pacemaker pocket erosion in our region is absolutely acceptable even in spite of relevant differences in the various pacemaker implanting centers. A system of continuous monitoring with the data collection of all the performed procedures would be extremely useful to constantly check the quality level both locally and regionally.

ATRIAL FIBRILLATION - I

Comparison of oral and intravenous loading dose of amiodarone for converting recent-onset atrial fibrillation (AMORE study). Preliminary data

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Intravenous amiodarone is considered a useful therapeutic means to convert recent-onset atrial fibrillation (AF), particularly in patients (pts) with concomitant heart diseases. On the other hand, oral amiodarone requires several days to reach steady-state conditions, and apparently is not suitable for this indication. It has been recently suggested by some authors to utilize the drug orally at a very high initial dose (30 mg/kg) in order to reach the therapeutic effect earlier. In this trial ("AMiodarone ORale contro Endovenoso") we compared the safety and efficacy of these two therapeutic strategies in pts with recent-onset AF (< 48 hours).

PROTOCOL. Only hospitalized pts with AF lasting > 2 hours and < 48 hours were eligible for this trial. The enrolled pts were randomized to receive either i.v. amiodarone (5 mg/kg initial bolus in 15 min, followed by a 15 mg/kg infusion in 24 hours), or oral amiodarone (30 mg/kg in a single bolus) during continuous ECG monitoring. A 30-s rhythm strip, blood pressure, a symptom score (dyspnea and palpitations: score between 0 and 3) and adverse events were monitored at 4-hour interval for 24 hours after starting treatment.

PATIENTS. Twelve pts (10 males and 2 females, mean age 66 ± 12 years) with AF lasting for an average of 5.1 ± 2.5 hours were preliminary included in this trial. In 10 pts a structural heart disease was diagnosed; basal heart rate (as measured in a 30-s strip at rest) was 114 ± 15 b/min; left atrium size was 47 ± 9 mm; ejection fraction was 55 ± 4%.

PRELIMINARY RESULTS. The two treatments were equally distributed among pts. In 4/6 pts (67%) sinus rhythm was restored in either group, after an average of 12.4 ± 7.3 hours (oral group) and 7.9 ± 6.8 hours (i.v. group); the mean heart rate before sinus rhythm restoration was lower during oral (95 b/min) than i.v. treatment (117 b/min). The drug was well tolerated; no adverse event was complained by pts given the drug orally, while a phlebitis in an antecubital vein was complained by a pt in the i.v. group.

CONCLUSIONS. These preliminary results seem to confirm that amiodarone is a safe drug to convert recent onset AF; unusually high doses of oral drug permit to reproduce the same efficacy of i.v. route, in the absence of any side effect and without the need of long stay in bed.

Comparison of amiodarone and propafenone in the conversion of paroxysmal atrial fibrillation

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PURPOSE. To compare the effectiveness of amiodarone and propafenone for cardioversion of paroxysmal atrial fibrillation (PAF).

METHODS. The sample of the study was represented by 263 patients (129 men and 134 women) aged 67.82 ± 10.6 years. Amiodarone was given to 181 patients and 82 were treated with propafenone. Twenty-six percent of the patients had hypertension, 20.15% had heart failure, 16.35% had coronary disease, 11.29% mitral regurgitation, 3.42% aortic stenosis, and 22.81% had no cardiologic history. PAF was newly diagnosed for the 45.63% of the patients. All patients had the dimension of their left atrium measured by echocardiography.

RESULTS.

	Amiodarone	Propafenone
Conversion (%)	89	96.3
Time of conversion (hours)	13.77±6.9	14.25±5.9
Men (%)	87	97.2
Women (%)	90.9	95.7
Left atrium (converted) (mm)	42.21±4.29	41.3±3.5
Left atrium (not converted) (mm)	44.55±4.8	43.3±1.5
Hypertension (%)	91.7	100
Heart failure (%)	88.6	88.9
Coronary disease (%)	83.9	91.7
No history (%)	89.2	100

CONCLUSIONS. Propafenone was more effective, especially in men, in patients with hypertension and in those with no cardiologic history. As the diameter of the left atrium increased the effectiveness of the two drugs decreased.

Sedation administered by cardiologists for transthoracic biphasic electrical cardioversion of persistent atrial fibrillation

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Midazolam, a benzodiazepine derivative, is being increasingly used in general and local anesthesia as well as for procedures requiring conscious sedation.

PURPOSE. To evaluate the safety and feasibility of sedation administered by cardiologists before transthoracic biphasic electrical cardioversion (TEC) for persistent atrial fibrillation (AF).

METHODS. Patients (pts) with persistent AF, without respiratory insufficiency, after pretreatment with oral anticoagulants for at least 3 weeks and, if clinically indicated, with amiodarone or other antiarrhythmic drugs, underwent elective TEC. Midazolam (0.05 mg/kg) was administered as intravenous bolus by the cardiologist, whereas the anesthesiologist was simply alerted. Other boluses (0.05 mg/kg) were allowed if clinically indicated. TEC was performed with hand-held paddles in antero-lateral position at increasing energy levels (100-200-300). At the end of the procedure, flumazenil 0.5 mg was given intravenously, followed by 0.5 mg in 1 hour. Pts were monitored by oscilloscopic monitoring and pulsossimetry.

RESULTS. Thirty-seven pts (19 female, 18 male, mean age 68 ± 6.6 years, range 48-83) with persistent AF (mean duration 2 ± 2 months) underwent TEC (mean energy 116, range 100-500). Sinus rhythm was restored in 36 pts (97%). Three pts had early recurrence and remained in AF at the end of the procedure. Mean time to sedation was 1.8 ± 1.3 min. The mean time between midazolam administration and patient awakening was 4.40 min. Only 6 pts required adjunctive dose of midazolam. The mean reduction in oxygen saturation was 2 ± 2%. Five pts were briefly ventilated before cardioversion. All pts were amnesic after the procedure. No adverse events were registered. No urgent call for the anesthesiologist was made.

CONCLUSIONS. Sedation administered by cardiologists for cardioversion of AF is feasible, safe and cost-effective. Midazolam was effective and well tolerated by pts. In our opinion, in the age of cost containment and of streamlined procedure, such an approach for cardioversion does allow save time and resource without increase the risk for patients.

Management of atrial fibrillation and atrial flutter in the Emergency Department

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PURPOSE. The aim of this retrospective study is to analyze the management of atrial fibrillation (AF) and atrial flutter (Flu) in the Emergency Department of the Policlinico Umberto I (General Hospital) in order to check the compliance with the official guidelines and improve our work.

METHODS. Patients (pts) were selected from January 1st to December 31st, 2002, using Gipse software system and ICD9 (International Code of Disease). We considered sex, age, clinical manifestations, AF classification, vital parameters, instrumental and hematic investigations, associated conditions, pharmacological treatment, cardioversion and relapse times, outgoing pts.

RESULTS. 613 pts were studied (506 AF, 107 Flu); 53.18% male (averaging 58), 46.72% female (averaging 62.77). 85% of pts came for the first time, while the remaining 15% had been admitted from 2 to 7 times; 31.03% of pts with AF reported the first detected episode, 55.5% were classified as paroxysmal or persistent (precise differentiation proved impossible); 13.82% were classified as permanent; 77.7% of all were recurrent. Most pts with AF complained of palpitations. This manifestation, alone, or in association with dyspnea, chest pain, fatigue, and vertigo, occurred in 65% of cases. 12.72% of pts presented no clinical manifestations. Most frequent investigations were: ECG (98%), cardiac necrosis markers (90%), oxygen blood analysis (17%). In 18% of cases we did not make any investigation.

AF therapy: propafenone (22.6%), Ca-channel antagonists (19.50%), amiodarone (7.12%), anticoagulant (17.65%), other drugs in a few cases. 24.4% of all pts with AF were not treated.

Flutter therapy: Ca-channel antagonists (29%), amiodarone (20%), anticoagulant (18%), propafenone (12%), DCC (4%). 13% of pts were not treated. Percentages refer to the use of each single drug, whether used in association or not.

Drug therapy was administered considering arrhythmias classification and associated conditions. Cardioversion to sinus rhythm was reached in 34% of pts with AF and in 25.23% of pts with Flu. In 20% of pts with AF, cardioversion was reported spontaneous, in 50% due to propafenone, in 10% to DCC, in 10% to amiodarone and in 10% to Ca-channel antagonists.

In Flu: 25.92% propafenone, 25.92% amiodarone, 22.2% DCC, 18.51% Ca-channel antagonists and in 7.45% spontaneous. 66.39% of pts were hospitalized, 18.44% were discharged, and 15.17% of pts refused hospitalization.

CONCLUSIONS. AF and Flu are the most common rhythm alterations we treated; although treatment depends on the operator, our work was carried out in accordance with recent guidelines on pharmacological treatment. Nonetheless, we object to recent studies whereby a large number of pts could be discharged as such a decision lies exclusively with the operator and his own experience.

Transcatheter ablation of atrial fibrillation with a new ring tip shaped cryocatheter

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BACKGROUND. Radiofrequency (RF) electrical disconnection of pulmonary veins (PVs) has been suggested as an effective treatment of AF, but complications such as PV stenosis, thromboembolic events and pericardial effusion may occur. Cryoenergy (CE) has sev-

eral favorable effects which reduce the risk of thromboembolism and vessel stenosis. The aim of this study was to evaluate the safety and effectiveness of PV isolation with a new designed CE catheter in patients (pts) with atrial fibrillation.

METHODS. Eighteen pts with drug refractory AF, were submitted to PV ablation. All pts underwent cardiac magnetic resonance (CMR) before and after the procedure. After a double septal puncture a decapolar LASSO® catheter was positioned at the PV ostia a ring tip shaped cryocatheter (Arctic Circler® Cryocath) was positioned at the PV ostia proximal to LASSO and CE was delivered to a temperature of -85°C for 4 min. The catheter was able to expand its curve and increase the diameter during the CE delivery enabling a better contact to the vessel wall. If PV disconnection was not achieved the Arctic catheter was re-placed in a different position and at least 4 applications for each vein were performed. If no isolation was obtained, CE was delivered by a standard cryocatheter with a 6 mm tip Freezor Xtra® (Cryocath) and, if ineffective, isolation was completed with standard 8 mm or cooled tip RF catheters.

RESULTS AND CONCLUSIONS. Seventy-one PVs were evaluated. Potentials were recorded in 52 pts. Of the 43 PVs treated, 31 (60%) were fully isolated with CE: 22 (43%) using the Arctic Circler catheter, 9 (17%) using both the Arctic Circler and Freezor catheter. In the remaining 19 (38%) isolation was completed with RF. In 1 patient the procedure was complicated by pericardial effusion without need of drainage. No other complications occurred and no PV stenosis was evident at CMR.

PV disconnection with a new designed ring shaped CE catheter is feasible and safe. The success rate may be enhanced by a 6 mm tip cryocatheter. The cumulative success rate is 60%.

Persistent atrial fibrillation and failed external cardioversion: the esophageal approach as a possible alternative to internal atrial cardioversion

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BACKGROUND. Patients (pts) with persistent atrial fibrillation (AF) and failed external electrical cardioversion (CV) currently represent the main indication for internal CV. We describe a new CV technique which avoids the positioning of a lead in the coronary sinus or in the pulmonary artery.

PATIENTS AND METHODS. Consecutive pts with persistent AF in whom external CV with energies up to 360 J failed to restore sinus rhythm were prospectively enrolled to receive esophageal CV (exclusion criteria: refusal of the procedure, esophageal disease, new-onset comorbidities, inadequate anticoagulation). A 10-pole, large surface area, dedicated lead (Esoflex 10, FIAB, Vicchio, Florence) was positioned in the esophagus under electrocardiographic guidance. All 10 poles were connected with each other via a junction box (FIAB F5402), and this combined wire was jointed to the negative pole of a biphasic defibrillator (Zoll RBW or Physiocontrol Lifepack 12). The second pole of the defibrillator was connected to a precordial adhesive patch electrode. Under general anesthesia cardioversion energy was delivered starting with 20 J and with stepwise increments (30-50-70-100 J) until AF termination or until completion of the protocol.

RESULTS. In the period between January 2000 and December 2002, 49 pts (32 males, mean age 62 ± 9 years, range 28-81) were enrolled. Out of the 49 pts, 39 had a structural heart disease (ischemic: 4; hypertensive: 23; valvular: 5; cardiomyopathy: 5; congenital: 2) and 23 presented with a first AF episode. The mean AF duration was 110 ± 101 days (range 1-400), left atrial anteroposterior diameter was 47 ± 7 mm (range 35-60). Sinus rhythm was restored in 45 pts (92%); the mean effective energy was 50 ± 20 J (range 20-100; median number of shocks: 3). Neither post-shock bradyarrhythmia requiring temporary pacing nor other complication was observed.

CONCLUSIONS. Esophageal CV was, also in our particular subset of pts, an effective, safe and well tolerated procedure. Thus, esophageal CV should be considered as a real alternative to the more invasive and more expensive internal CV.

Relapse rate after electrical transthoracic cardioversion of atrial fibrillation performed in day hospital

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A major problem in day hospital management of atrial fibrillation (AF) is represented by the risk of early relapse and by the necessity of a brief hospitalization. The aim of this study is to verify the safety of the management of this treatment evaluating the risk of early (within 48 hours) and at medium term (6 months) arrhythmic relapse after cardioversion.

We evaluated 96 consecutive patients (71 males and 25 females, mean age 68 years), affected by chronic AF (mean duration 172.3 days) of different etiology: 16% of patients had systemic hypertension, 14.6% ischemic heart disease, 14% dilated cardiomyopathy, 33% valvular disease, while 22.4% patients had lone AF.

All the patients were treated before the procedure by dicumarols with INR > 2 for at least 4 weeks, and according to blood pressure values were in treatment with ACE-inhibitors or calcium-blockers (amlodipine or nifedipine) and underwent, after blood samples and echocardiographic evaluation, electrical cardioversion

by biphasic shock and successively an ECG monitoring for at least 6 hours.

Before hospital discharge patients were continuing therapy by amiodarone alone or plus carvedilol in 61 patients (63%), by propafenone in 21 patients (22%), and by sotalol in 14 (15%).

RESULTS. In none of the patients the single day hospital discharge caused AF relapse within 48 hours, showing the total safety of the management of this treatment. Moreover, of 61 patients treated by amiodarone, 47 (77.1%) were in sinus rhythm after 6 months (75% of whom were pre-treated by ACE-inhibitors, and 25% were not) and 14 patients (22.9%) presented AF relapse (60% in therapy with ACE-inhibitors); of 21 patients treated by propafenone, 12 (57.1%) were in sinus rhythm at the sixth month (73% of whom were pre-treated by ACE-inhibitors) while 9 (42.9%) relapsed in AF (50% in therapy by ACE-inhibitors); of 14 patients treated by sotalol, 8 (57.2%) were in sinus rhythm (63% of whom with ACE-inhibitors) while 6 (42.8%) were in AF at the sixth month (60% in therapy by ACE-inhibitors).

CONCLUSIONS. Our study shows that none of our patients had a early relapse (within 48 hours) of AF, demonstrating the not necessity of a prolonged hospitalization; moreover, according with literature data, it shows that the elective treatment for the prevention of AF relapse is represented, when it is possible, by the association amiodarone-carvedilol, while the medium-term efficacy of propafenone and sotalol is significantly lower.

ATRIAL FIBRILLATION - II

The role of the left atrium in the conversion of paroxysmal atrial fibrillation

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PURPOSE. To study patients with paroxysmal atrial fibrillation (PAF) related to the dimensions of their left atrium (LA) measured by echocardiography and their medical history.

METHODS. The sample of the study was represented by 355 patients (168 men and 187 women) aged 67.81 ± 11.5 years, who were hospitalized in our department during the period 2000-2002. Twenty-six percent of the patients suffered from hypertension, 22.6% had heart failure, 15.8% coronary disease, 10.9% mitral regurgitation, 3.1% chronic pulmonary disease, 2.8% aortic stenosis, 1.4% hyperthyroidism, and 16.9% had no previous cardiologic problems. All patients had the dimension of their LA measured by echocardiography.

RESULTS. Conversion was achieved in 88.7% of the patients with left atrial size 41.87 ± 3.76 mm. The echocardiography showed that the LA of patients with newly diagnosed PAF was 41.12 ± 2.75 mm, of those with recurrent PAF was 42.99 ± 4.36 mm, the largest left atrial size was measured in patients with no converted atrial fibrillation 44.35 ± 3.84 mm ($p < 0.001$). The rates of conversion for each category of patients with underlying pathology were: 75% for patients with heart failure, 89.2% with hypertension, 89.3% with coronary disease, 90% with aortic stenosis, 95.2% with mitral regurgitation, 100% with pulmonary disease and hyperthyroidism, and 90.7% for those with free history. The time of conversion was little related to the dimension of LA ($r = 0.26$).

CONCLUSIONS. Patients with PAF and heart failure had the lowest rate of conversion. The more the dimension of LA increases, the less the conversion of PAF is succeeded.

Role of autonomic nervous system on the efficacy of hybrid therapy in patients with paroxysmal atrial fibrillation

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It is well known that 10 to 15% patients (pts) chronically treated with class IC antiarrhythmic drugs (AAD) for paroxysmal atrial fibrillation (AF) experienced conversion of AF to typical atrial flutter (AFL) that could be successfully treated with isthmus ablation. This combined therapy is safe and associated with satisfactory results not only in the treatment of drug-induced AFL but paroxysmal AF as well. The aim of our study was to compare the clinical efficacy of this therapeutical strategy in pts with vagally and adrenergically induced AF.

Sixty-seven consecutive pts (38 males, 29 females, mean age 61.8 ± 9.5 years) were referred to our institution for catheter ablation of typical AFL documented during the treatment of paroxysmal AF with class IC AAD flecainide (46 pts) or propafenone (21 pts). Vagally mediated paroxysmal AF (attacks at night or at rest, preceded by bradycardia) were identified in 28 pts. Adrenergically mediated AF (attacks at daytime, during stress, exercise, preceded by heart rate acceleration) in 23 pts. Clinical presentations of both (vagally and adrenergically induced AF) were identified in 16 pts. All pts had good left ventricular function and normal coronary angiogram. Isthmus ablation was successfully performed in all pts. After radiofrequency ablation all pts continued with pre-existing antiarrhythmic therapy. During a mean follow-up of 22.7 ± 8.6 months 65.7% pts were in sinus rhythm and 34.3% pts had experienced episodes of AF. The AF recurrence rate was significantly lower in the group of pts with adrenergically mediated AF (21.7%) than in pts with clinical signs of vagally mediated paroxysmal AF (42.9%).

CONCLUSIONS. These results suggest that the autonomic nervous system plays an important role on the long-term efficacy of combined therapy with radiofrequency ablation of drug-induced AFL and chronic class IC AAD therapy in pts with paroxysmal AF.

Independent predictors of time to first recurrence after successful conversion of atrial fibrillation

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PURPOSE OF THE STUDY. To identify clinical and echocardiographic predictors of time to first recurrence of atrial fibrillation (AF) after successful cardioversion (CV).

METHODS. Out of 335 patients with first persistent nonvalvular AF ever experienced, CV was successful in 255 patients and these patients were assigned to further follow-up until the development of permanent AF or at least 1 year in sinus rhythm. Baseline clinical and echocardiographic parameters (Table I) were recorded before CV. Each patient received a class IC or III antiarrhythmic drug according to current recommendations. Repeated CVs were performed if necessary. Multiple logistic regression model within 95% CI was used for identification of independent predictors of time to first recurrence of AF. Independent variables in this model were parameters from Table I.

Table I

Clinical variables	No. (%)	Echo variables	Normal	Borderline	Enlarged
Idiopathic AF	124 (37.0)	LV EDD	236 (70.4)	67 (20.0)	32 (9.6)
Hypertension	140 (41.8)	LV ESD	253 (75.5)	41 (12.2)	41 (12.2)
Coronary HD	25 (7.5)	LV EF	267 (79.9)	52 (15.5)	16 (4.8)
Cardiomyopathies	39 (11.6)	LA	137 (40.9)		198 (59.1)
Heart failure	33 (9.9)	RA and RV	317 (94.6)	14 (4.2)	4 (1.2)
Diabetes mellitus	19 (5.7)	MAC (mitral annulus calcification) 63 (18.8)			
Hiatus hernia	10 (3.0)				
Obesity	34 (10.1)	Age: 17-78 years (53.98±11.69)			
AF > 48 hours	278 (83.0)	Females: 101 (30.1)			
AF > 1 year	69 (17.9)	AF duration: 48 hours-72 months (8.6±13.5 months)			

RESULTS. During the follow-up which lasted 0.5 to 15 years (4.4 ± 3.2 years), recurrent AF was documented in 215 pts (84.3%). Time to first recurrence of AF ranged from 2 weeks to 12 years (24.3 ± 22.8 months). Independent predictors of time to first recurrence are shown in Table II.

Table II

						95% Confidence Interval for Relative Risk		
Variable	B	SE	Wald	df	p	RR	Lower	Higher
Coronary HD	1.1002	0.3857	8.1372	1	0.004	3.0049	1.4110	6.3993
AF > 1 year	1.3744	0.4409	9.7165	1	0.002	3.9528	1.6657	9.3805
Heart failure	0.6122	0.2835	4.6618	1	0.031	1.8444	1.0581	3.2152
AF > 48 hours	0.8608	0.3431	6.2945	1	0.012	2.3649	1.2072	4.6329
AF duration	0.0414	0.0072	33.166	1	0.000	1.0423	1.0277	1.0571
LA > 40 mm	0.6555	0.2146	9.3282	1	0.002	1.9261	1.2647	2.9333

CONCLUSIONS. As appears, patients with heart failure, coronary heart disease, dilated left atrium and long-lasting AF have the highest risk of early recurrence of AF. They either should be assigned to amiodarone or one may consider rate control strategy early in the course of treatment. The somehow surprising importance of AF lasting even more than 48 hours should have some therapeutic implications, too.

Prediction of early recurrence of atrial fibrillation in patients with ischemic heart disease: rationale for selective preventive antiarrhythmic therapy

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AIM OF THE STUDY. To estimate risk prediction of atrial fibrillation (AF) recurrence during the first month after cardioversion, and to evaluate preventive antiarrhythmic therapy with amiodarone according to risk groups.

PATIENTS AND METHODS. Retrospective study of anamnestic, clinical, echocardiographic data and methods of cardioversion in 294 patients (group I) with no treatment with class I and III antiarrhythmic drugs was performed. Value of risk prediction in the setting of antiarrhythmic therapy was estimated in a control group of 118 patients, treated with amiodarone (group II).

RESULTS. The binary logistic regression model for prediction of early recurrence of ischemic AF was based on the formula: $P\ (y = 1/x_1,...x_k) = e^z/(1+e^z)$, where $Z = \beta_0 + \beta_1 x_1 +...+ \beta_k x_k$. The best sensitivity (0.82) and negative predictive value (0.89) were achieved including patient age, number of AF episodes, mitral valve incompetence and severity of regurgitation, left atrial superoinferior dimensions, thyroid pathology, use of beta-blockers, and method of cardioversion in the algorithm. Early recurrence of AF occurred in 103 (35%) of group I and in 44 (37.3%) of group II patients. Preventive treatment with amiodarone showed no benefit in non-selective groups, whereas antiarrhythmic therapy in high-risk patients resulted in significantly lower recurrence rates in group II (46.3 vs 67.7%; $p < 0.01$). According to our prognostic model "selective" approach would have determined antiarrhythmic therapy in 69.5% group II patients. The calculated loss of patients misclassified by the algorithm, and not treated with amiodarone was approximately 3%.

CONCLUSIONS. The prognostic model allows identifying prospectively high-risk patients for early AF recurrence. Prophylactic antiarrhythmic therapy with amiodarone in high-risk patients results in significantly lower recurrence rates.

Atrial conduction during permanent biatrial and right atrial pacing. A comparison of electrophysiological effects of pacing

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The role of intra- and interatrial conduction disturbances (IACD) in pathogenesis of atrial arrhythmias has been proved. Electrophysiological effects of right atrial pacing (RAP) are rarely considered, and most of

patients with brady-tachy syndrome and IACD receive RA based pacing system. Biatrial pacing modes (BiAP) created the new therapeutic option especially for patients in which RAP aggravate of arrhythmia.

In 18 pts with IACD and modified split BP BiAP system with the cathode connected to the ring of the BP CS lead, implanted due to recurrent atrial arrhythmias (tachy-brady syndrome), we evaluated classical ECG and IEGM (obtained with telemetry) during sinus rhythm, RAP and BiAP. Connection of cathode to CS lead allows separate CS (UP program), RA (BP low energy), and BiA (BP higher energy) pacing.

	No. pts	P(S)-QII (ms) in ECG	PII (ms) in ECG	TAAT (ms) in IEGM	IACT (ms) in IEGM
Sinus rhythm	16	204	147.7	188.3	114.7
RAP	18	238.6	168.9	231.1	161.6
CS (UP)	18	201.1	149.8	177.7	153.9
BiAP	18	198.4	127.5	145.9	—

IACT = onset P or spike - onset A of the left atrium; TAAT = onset P or spike - end of A of the left atrium.

CONCLUSIONS. 1) There is a very significant difference in electrophysiological effects between RAP and BiAP. 2) BiAP, in contrast to RAP, normalizes P-wave duration and timing of both atria. 3) Biatrial pacing modes (BiAP) created the new therapeutic option especially for patients in which RAP aggravate of arrhythmia. 4) Telemetry with IEGM is a useful noninvasive method of recognize IACD.

Supraventricular arrhythmias before lung surgery as a predicting factor for early postoperative atrial fibrillation

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PURPOSE OF THE STUDY. Paroxysmal atrial fibrillation (PAF) in the early postoperative period can influence patient's clinical condition, delay recovery and increase costs of treatment. The aim of this study was to determine the influence of supraventricular arrhythmias before lung surgery in predicting postoperative atrial fibrillation after lung surgery.

METHODS. In 97 patients (23 females, 74 males; mean age 61.9 ± 8.8 years) undergoing pulmonary resection because of lung cancer without history of previous supraventricular arrhythmias we examined the relation of clinical, echocardiographic and 24-hour electrocardiographic parameters to episodes of PAF after lung surgery. The total number of supraventricular premature beats and supraventricular tachycardia was analyzed few days before surgery and since operation end up to the third postoperative day.

RESULTS. Seventy-eight episodes of postoperative PAF occurred in 22 patients (22%) during 3 days of Holter monitoring. Postoperative PAF was strongly related to the total number of preoperative supraventricular premature beats and to the number of supraventricular tachycardia before surgery ($p < 0.03$). In patients with postoperative PAF the mean total number of supraventricular premature beats was significantly higher than in patients without postoperative PAF (401.7 ± 632.2 vs 116.3 ± 174.5/24 hours, $p < 0.001$). Patients who established postoperative PAF were significantly older when compared with patients without PAF (66.1 ± 7.3 vs 59.4 ± 8.7, $p < 0.001$). The incidence of PAF was significantly higher in patients who undergo intrapericardial pneumonectomy in comparison to extrapericardial pneumonectomy (31 vs 27%, $p < 0.001$). There was no relationship between left atrial diameter, left ventricular ejection fraction and the frequency of PAF during the postoperative period.

CONCLUSIONS. Among patients after lung surgery because of cancer, total number of supraventricular premature beats, presence of supraventricular tachycardia during 24-hour Holter monitoring before operation, age and intrapericardial pneumonectomy, were predictors of postoperative PAF.

SYNCOPE AND CARDIAC ARREST

Assessment of the quality of life of patients with sinus node dysfunction

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OBJECTIVE. To determine the quality of life (QoL) of the patients with sick sinus syndrome (SSS) and autonomic sinus node dysfunction (ASND) with the use of Russian version of the SF-36 Health Survey.

METHODS. Three hundred patients were randomly selected from a patient database: 140 patients with SSS (65 men, mean age 69 ± 1 years), 130 patients with ASND (53 men, mean age 63 ± 1 years) and 30 patients without sinus node dysfunction (16 men, age 62 ± 1 years) - control group (CG). Diagnosis and type of sinus node dysfunction (SSS vs ASND) were confirmed by Holter ECG monitoring with assessment of heart rate variability, exercise ECG testing and transesophageal electrophysiological study. QoL was assessed by 11 scales of the SF-36 questionnaire, including physical functioning (PF), role limitations due to physical health (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role limitations due to emotional problems (RE), and mental health (MH).

RESULTS. No difference in QoL indices was revealed between SSS and ASND. In patients with SSS and ASND all QoL indices were lower than in the reference material apart from the SF index which was not different between the groups. The highest degree of QoL for patients with SSS ad ASND was found for RP, GH and VT indices (RP_{SSS} 43 ± 4, RP_{ASND} 45 ± 4 and RP_{CG} 90 ± 1, $p < 0.001$; GH_{SSS} 47 ± 2, GH_{ASND} 51 ± 2 and GH_{CG} 73 ± 2, $p < 0.001$; VT_{SSS} 46 ± 2, VT_{ASND} 49 ± 2 and VT_{CG} 62 ± 1, $p < 0.001$).

CONCLUSIONS. The assessment of QoL of the patients with sinus node dysfunction with the use of the "SF-36" permits one to reveal it is significant lower in patients with SSS and ASND in comparison with the data for patients without sinus node dysfunction. No significant difference was found between the indices of QoL in patients with SSS and in those with ASND.

Management of syncope in the Emergency Department

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PURPOSE. The aim of this study is to provide epidemiological evidence about patients with syncope and its related cardiogenic origin.

METHODS. 1130 patients were selected in the Emergency Department, from January 1st to September 30th, 2002. We considered: sex, age, clinical manifestations, instrumental investigations, outgoing patients, hospitalization.

RESULTS. 1130 patients were studied , 46.4% male (averaging 58.5), 53.6% female (averaging 58). 40.5% of all (averaging 50.5) were discharged after clinical investigations: ECG (69.4%), neurological advice (25.1%), brain CAT scan (10.9%), breast X-ray (12%); 32.3% reported neurological cause of syncope; 10.9% reported unknown cause; 0.1% died in the Emergency Department; 58.05% were hospitalized in the Emergency Medicine Department (averaging 64). We made hematological investigations (83.3%), ECG (76.9%), brain CAT scan (17.9%), neurological advice (35.3%), Pacing Center advice (24%); 44.05% of hospitalized patients wanted to be discharged, 20.4% were discharged after approximately 2 days, 0.55% died in the Emergency Medicine Department. The remaining 35% were hospitalized in other departments.

CONCLUSIONS. Vasovagal syncope was detected in young patients, timely discharged. Patients aged > 60 were hospitalized as those who presented associated conditions. Cardiogenic origin of syncope, when supposed, was the most common cause of hospitalization.

How is syncope evaluated in Italian hospitals? The first "Censimento Nazionale dei Centri per lo Studio della Sincope"

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Task-Force Associazione Italiana di Aritmologia e Cardiostimolazione: "Modello organizzativo di Syncope Unit"

AIM. To evaluate how the main non-invasive tests for the diagnostic assessment of syncope (carotid sinus massage; head-up tilt testing; adenosine testing) are currently performed in the Italian hospitals.

METHODS. During the early 2003 dedicated questionnaires were posted to more than 400 Italian hospitals. The questionnaires were also supplied to the participants in the "I Congresso Multidisciplinare sulla Sincope" (Rimini, April 2003) and were available on .pdf format on the Website of the "Associazione Italiana di Aritmologia e Cardiostimolazione". About each test information was requested relative to: test protocol, laboratory equipment, number of patients evaluated during 2002.

RESULTS. Eighty-four hospitals answered the questionnaire. A syncope-dedicated ambulatory (at least once a week) was available during 2002 in 59/84 hospitals, and in 56 was dependent on the Cardiology Division. Carotid sinus massage was performed either in clinostatic and in orthostatic position in 60 centers and was repeated after atropine in 15. To define the positivity of the test, 35 centers followed the so-called "symptom method". Only 15 centers performed more than 100 procedures during 2002 (range 3-500). Head-up tilt test was performed in 72 hospitals. A dedicated tilting bed was available in 65 centers, and continuous beat-to-beat pressure measurement in 22. Out of the 72 centers, 55 followed the so-called "Italian Protocol" as the main methodology of the test. Only 17 centers performed more than 100 procedures during 2002 (range 3-500). Adenosine testing was performed in 26 hospitals, the median dose of drug administered was 18 mg (range 6-20); 25 out 26 centers considered the test as positive when an asystolic pause ≥ 6 s was observed. Only 6 centers performed more than 15 procedures during 2002 (range 1-204).

CONCLUSIONS. Among the different centers a great variability was observed relative to the methodology of each test and to the number of procedures performed. Thus, a standardization effort about the methodology of syncope study is still needed by the Medical Associations.

Trauma caused by transitory loss of consciousness: different occurrence and clinical characteristics among patients with syncope and non-syncopal attacks

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AIM. To evaluate the occurrence and clinical characteristics of secondary trauma (TR) among patients with syncope and non-syncopal attacks.

METHODS. Starting from August 2002 we prompted a Syncope Unit, that is a multidisciplinary functional structure which includes the Emergency Department (ED). All the clinical data relative to patients presenting with a transitory loss of consciousness (TLC) were prospectively collected since the ED triage and stored in a dedicated database. The TLC patients were evaluated according to the methodology and the diagnostic criteria suggested by the 2001 European Society of Cardiology guidelines on the management of syncope.

RESULTS. Among 718 consecutive TLC patients observed between September 1st, 2002 and September 30th, 2003, 626 were diagnosed as having syncope and 92 a non-syncopal attack. The occurrence of trauma among the different subgroups of patients is reported in the Table.

Diagnosis	No. pts	t-Trauma	p	s-Trauma	p
a-Non-syncope	92	20 (21%)	NS*	1 (1%)	0.003°
b-Epilepsy	46	13 (28%)	NS*	–	0.003°°
c-Syncope (total)	626	201 (32%)	NS*	38 (6%)	0.003°
d-Cardiogenic syncope	32	10 (30%)	NS*	4 (13%)	0.002^ 0.005^^

s = severe; t = total. * avsc, bvsc, cvsd, dvsa, dvsb; ° avsc; °° bvsc; ^ dvsa; ^^ dvsc.

CONCLUSIONS. The prevalence of trauma did not differ among patients with syncope or with a non-syncopal attack. Nevertheless, a severe trauma occurred almost exclusively among patients with syncope, particularly those with cardiogenic syncope or with cardioinhibitory carotid sinus syncope. This could represent a useful diagnostic tool for the ED initial evaluation of TLC patients.

Description of 11 cases of successful resuscitation after cardiac arrest

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PURPOSE. Describe various factors at resuscitation and outcome among patients suffering from cardiac arrest and survived after successful resuscitation.

METHODS. During the fist semester of 2003 we studied 11 patients (7 males and 4 females) affected by cardiac arrest. Seven of them had out-of-hospital cardiac arrest and were bystander witnessed. The mean age was 62 ± 14 years. There was no history of heart disease unless in 5 patients affected by: 1 coronary disease, 1 valvular disease, 2 hypertensive heart disease. First presenting rhythm at the scene was ventricular fibrillation in 8 cases, pulseless ventricular tachycardia in 2 cases, and ventricular tachycardia in the other one.

RESULTS. The mean time interval from call to medical assessment was 4.7 min. All patients were exposed to cardiopulmonary resuscitation for 46 ± 44 min, DC cardioversion 29 ± 28 times and i.v. administration of 1 mg adrenaline repeated every 3-5 min, 1.5 mg/kg lidocaine repeated in 5 min, 1 mmol/kg bicarbonate. Moreover, 6 patients received 300 mg of amiodarone and repeated doses of 150 mg and 2 of them also received procainamide 30 mg/min. Spontaneous circulation was re-established in all cases, but 9 patients needed mechanical ventilation. The cause of cardiac arrest was found to be in all patients a myocardial ischemia except from one affected by hypokalemia. Six patients were admitted to the intensive care unit and 2 in the coronary care unit. All patients except one were discharged alive from the hospital after a mean of 11 days. In 5 patients was implanted a defibrillator.

CONCLUSION. For a successful resuscitation are necessary at least three skilled and well coordinated persons: a team leader ready to intubate, a second one performing the chest compressions, and a last one ready to defibrillate. Prolonging resuscitation efforts beyond 30 min without a return of spontaneous circulation is not always futile. In some cases of prolonged ventricular fibrillation amiodarone and procainamide could be effective in resolving this lethal arrhythmia.

Sudden death syndrome in the Emergency Department

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PURPOSE. The aim of this study is to provide epidemiological evidence about patients with sudden death syndrome (SDS).

METHODS. This retrospective study was carried out using ICD9 code (427.5). 235 sudden death cases occurred from July 2000 to December 2002 in our Emergency Department. We considered: age, sex, associated conditions, initial rhythm, resuscitation time, drug therapy, admittance time to the Emergency Department.

RESULTS. Only 2.5% of 235 SDS was a primary complication. Men are reported having a higher incidence of SDS than women: the ratio was of 139 men to 96 women. Approximately 3.4% of patients with SDS presented ventricular flutter as the initial rhythm. The latter being associated with the best prognosis. 90.22% of patients died and only 9.78% survived. SDS occurred in men aged 66.46 years (average) and in women aged 74 years (average). The most frequent associated conditions were: cardiovascular disease (30.2%), hypertension (9.69%), cancer (11%), diabetes (8.37%), ARDS (4.8%), trauma (4.8%), psychotropic drugs (4.4%), kidney failure (3%); associated conditions could not be detected in 23.74% cases, due to the lack of clinical history. SDS occurred mainly in daytime, although no direct connection with physical activity was reported.

CONCLUSIONS. SDS in patients with flutter or ventricular fibrillation as initial rhythm had the best prognosis. In Italy law no. 120 (dated April 3rd, 2001) provides that semiautomatic defibrillation may also be operated by non-medical trained personnel. This proved useful to reduce SDS mortality by 40%. Timely cardiopulmonary resuscitation, early defibrillation and advanced therapeutic support are the most appropriate and efficient strategies in SDS treatment. It is highly recommended to train the largest number of population on cardiopulmonary resuscitation techniques, and provide public places with semiautomatic defibrillation devices.