

## ANALYSIS AND RECOMMENDATIONS ON ATRIAL FIBRILLATION PERIOPERATIVE. CLINICAL EXPERIENCE

GIOVANNI CANTARELLA\*, GIUSEPPA LA CAMERA, LUCA VITALE, PIERFILIPPO DI MARCO, DANILO CARMELO GRASSO, EMILIO FRASCA

University of Catania, Department of Medical Surgical Specialties, Section of Anesthesia and Intensive Care, \*Department of Medical and Pediatric-University of Catania

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*[Analisi e raccomandazioni sulla fibrillazione atriale perioperatoria. Esperienza clinica]*

### ABSTRACT

The authors, after analyzing the causes of atrial fibrillation (AF) and its incidence, provide some recommendations in order to get the restoration of sinus rhythm or the control of heart rate and to contain the risk of thromboembolism. In order to do this, they select 14 patients and examine them through clinical and laboratory tests in order to frame the nature of AF, drug treatment and the risk of thromboembolism. In 12 patients with permanent AF out of the 14 patients considered, the authors have just checked the heart rate, while in 2, affected by new-onset forms of AF, they have proceeded to the pharmacological conversion of rhythm and its sinus maintenance.

**Key words:** Atrial fibrillation, cardioversion, thromboembolic risk, treatment.

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### Introduction

Atrial fibrillation (AF) is the sustained arrhythmia most frequently encountered in clinical practice.

Its prevalence in the general population is about 1% and increases with age, from 0.1% in those aged less than 55 years, 9% in those aged over 80 years.

The idiopathic AF “*lone atrial fibrillation*” (5-10%), which cannot be traced to a specific root cause, affects individuals younger than 60 years. The secondary form is the most frequent and its determining causes can be subdivided into “*reversible*” - such as pericarditis, acute myocardial infarction, hyperthyroidism, hypertension (present in 50 - 65% cases), diabetes mellitus (present in 15-20%), obesity and smoking - and “*permanent*”, such as organic heart diseases<sup>(1)</sup>.

### Materials and methods

From June 2010 to December 2011 fourteen patients of both sexes aged between 64 and 80 years were enrolled and came under our observation at the Cardiologic outpatient clinic of the General Hospital – University “Gaspere Rodolico” in Catania. Twelve patients were affected by permanent AF, while two of them by a first episode of AF. One of them had been reported to the ward immediately after surgery and the other in the operating room before surgery was postponed. In the cardiologic examination performed the day before, the two patients had an ECG where the rhythm was sinus.

The enrolled subjects, not obese, had to undergo major abdominal surgery and therefore long-term and / or highly radical. Preoperative characteristics of the 14 cases studied are listed in Table 1.

Patient	Sex	Age	AF	FC bpm	Anticoagulant antiplatelet treatment	Pharmacological treatment for arrhythmia
F.A.	F	75	120	permanent	anticoagulant	digoxin
I.L.	M	64	80	new-onset	antiplatelet	verapamil
T.R.	F	78	110	permanent	anticoagulant	amiodarone
G.S.	M	71	90	permanent	anticoagulant	$\beta$ - blockers
R.L.	M	68	70	permanent	antiplatelet	verapamil
C.G.	F	65	75	new onset	none	none
B.M.	M	80	92	permanent	anticoagulant	digoxin
S.M.	F	72	88	permanent	anticoagulant	$\beta$ - blockers
P.F.	M	76	102	permanent	anticoagulant	digoxin
T.F.	M	68	96	permanent	anticoagulant	verapamil
F.D.	F	74	98	permanent	anticoagulant	verapamil
M.G.	F	77	105	permanent	anticoagulant	$\beta$ - blockers
P.A.	M	67	82	new onset	none	none
C.B.	F	75	91	permanent	anticoagulant	digoxin

The cardiac evaluation included medical history, physical cardiovascular examination, laboratory tests and instrumental screenings<sup>(2)</sup>.

The anamnesis reported a family history of AF (one case), palpitations (six cases), dyspnea (three cases) and fatigue for minor efforts (three cases). Six patients were hypertensive on pharmacological treatment, two diabetic males, one affected by a peripheral arterial disease. There was no record of diseases due to previous stroke, TIA, thromboembolism, pericarditis, myocarditis or potentially responsible extracardiac factors (i.e. hyperthyroidism, alcohol abuse and smoking).

In the physical cardiovascular examination a cardiac mitral systolic murmur was found in six patients, while chest and peripheral examination was negative.

All patients were subjected to an electrocardiogram, that tested negative for signs of previous infarction. Moreover, some laboratory tests (TSH, FT, complete blood count, serum electrolytes, renal and liver function monitoring) and the chest X-ray were carried out.

In those affected by a systolic murmur or dyspnea was performed a transthoracic echocardiography and a stress test was planned in those with exertional dyspnea and easy fatigability.

The results of all these tests were within normal limits except four echocardiographic examinations in which it was found a mitral valve pathology with left atrial enlargement in the absence of visible thrombus. In the patient with a first episode of atrial fibrillation<sup>3</sup> - after an echocardiography evaluation which excluded the presence of thrombus in the atrium - it was performed the pharmacological cardioversion with amiodarone iv, dissolved in 5% glucose solution, initially as a bolus (7 mg/kg in 20 minutes) and continuation of therapy with infusion (15 mg/kg in 24 hours), administering fractionated heparin, with resolution of the arrhythmia within 24-48 hours. The intravenous infusion (300 mg/24 hours) continued until the resumption of oral feeding. At this point

we continued with the administration of oral tablets (400 mg/day) and started therapy with oral anticoagulant, in relation to surgical requirements, while maintaining the INR values between 2 and 3.4 The oral anticoagulant has been kept for 4 weeks or indefinitely, in relation to the thromboembolic risk calculated<sup>(5)</sup>.

In the remaining 12 patients we have maintained drug treatment in place for values less than 80 bpm at rest by adding a  $\beta$ 1-selective  $\beta$ -blocker (atenolol or bisoprolol) if the values were higher<sup>(6)</sup>.

We stratified the risk of thromboembolism in order to ensure proper anticoagulation or antiplatelet treatment, using the scoring system CHA2DS2 VASC Risk Score that considers various risk factors for thromboembolism. The clinical verification of our patients confirmed the correct use of the antithrombotic therapy<sup>(5)</sup>.

In relation to the risk of bleeding related to the type of surgery, we have discontinued the administration of aspirin (7-10 days before surgery) when necessary, while it has not been recommended the use of "bridging anticoagulation" with heparin as it

has not been shown in the literature any rational about its use.

In patients who have been treated with oral anticoagulants we have discontinued oral therapy for at least 48 hours (the time required to achieve an INR <2) and started, 3-4 days before the antithrombotic procedure, a therapy with unfractionated heparin (UFH) for intravenously or, alternatively, a low molecular weight heparin (LMWH) subcutaneously (at a dose of 70% of the therapeutic one, in two daily administrations), by administering the last dose of LMWH 12 hours before surgery or by interrupting the UFH 4 h before surgery<sup>(5)</sup>.

## Results

In the post-operative period, all patients who underwent surgery had a heart rate not above 110 bpm, that a recent randomized study (RACE 11) has shown not to be riskier than a control strategy of frequency of more aggressive rate <80 bpm.<sup>7</sup> Cardioverted patients have maintained sinus rhythm continuing the therapy with Cordarone, initially by infusion and then orally according to guidelines<sup>(8)</sup>.

During the post-operative period we performed ECG screenings and monitored the values of magnesium, potassium and calcium, due to the administration in some patients of digoxin, since hypomagnesaemia - as well as normal potassium values - predispose to the development of digitalis-induced arrhythmias<sup>9</sup> and of amiodarone (class III antiarrhythmic), resulting in a prolonged duration of the action potential with abnormal QT prolongation and risk of "torsades de pointes", especially in the presence of ipokaliernia, ipomagnesiernia, hypocalcemia, intensive treatment with diuretics or bradycardia<sup>(10)</sup>.

Within two days after surgery, depending on the patient's haemostatic status, the administration of LMWH or UFH has been restored and has been continued after the reintroduction of the oral anticoagulant until obtaining target INR (2-3).

## Discussion

The FA determines long-term changes in electrical, anatomical and mechanical properties of atrial muscle mass with endangerment of the normal atrial contractile function (stunning).

These changes are called atrial remodeling and contribute to the repetition and perpetuation of the arrhythmia.

In new-onset forms which are documented for the first time in patients with no history of AF prior the therapeutic choice is the rhythm control that, in the absence of significant cardiac disease and if appeared within 48 hours, is performed by pharmacological therapy. In permanent forms, often because of atrial remodeling, in which cardioversion attempts are unsuccessful for failure to restore sinus rhythm or for early relapse of arrhythmia, it is chosen to check the heart rate<sup>(11)</sup>.

## Conclusions

The main objective of the cardiology screening in patients affected by AF that need to undergo surgery is to maintain the patient's hemodynamic stability. This result can be achieved through the maintenance of proper heart rate and, when possible, by the restoration of sinus rhythm. The use of antiarrhythmic drugs also requires a careful control of the patient's electrolyte values.

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*Request reprints from:*

Dott. DI MARCO PIERFILIPPO  
Via Orchidea, 18  
95123 Catania  
(Italy)