

## Patterns of Clinical Presentation of Atrial Fibrillation in Hospitalized Patients

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**Introduction and objectives.** The ACC/AHA/ESC 2001 guidelines for the management of atrial fibrillation (AF) establish 4 categories: first episode, paroxysmal, persistent and permanent. The aim of this study was to analyze the frequency of the different clinical patterns of presentation of AF in hospitalized patients.

**Patients and method.** We analyzed the pattern of AF in 300 hospitalized patients, 200 of whom were admitted to the cardiology and 100 to the internal medicine department. We determined the clinical profile and evaluated the factors influencing therapeutic management.

**Results.** The permanent form was present in 30% of the patients admitted to the cardiology department and in 51% if those admitted to the internal medicine department. The first episode pattern was the most frequent in cardiology department patients (41%). In patients hospitalized in the cardiology the percentage use of anticoagulants (57.9% vs. 41%;  $p < 0.01$ ) and beta blockers was greater than in internal medicine patients, and digitalis use was lower. In the multivariate analysis, admission to the cardiology department was an independent predictor of treatment with beta blockers (OR = 3.8; 95% CI, 1.3-11.1;  $p < 0.05$ ), and discharge from the hospital with AF was a predictor of anticoagulant prescription (OR = 4.8; 95% CI, 2.5-9.2;  $p < 0.001$ ).

**Conclusions.** a) Atrial fibrillation is an arrhythmia with a heterogeneous clinical pattern that varies depending on the type of care provided; b) on admission to cardiology, only 30% of the patients present with permanent arrhythmia, and the most frequent clinical pattern is first episode; and c) discharge from the hospital with AF was the principal determinant of therapeutic management.

**Key words:** Atrial fibrillation. Anticoagulation. Arrhythmias.

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### Patrones clínicos de presentación de la fibrilación auricular en los pacientes hospitalizados

**Introducción y objetivos.** La guía ACC/AHA/ESC 2001 para el tratamiento de la fibrilación auricular (FA) establece 4 categorías: primer episodio, paroxística, persistente y permanente. El objetivo es analizar la frecuencia de los distintos patrones clínicos de presentación de FA en los pacientes hospitalizados.

**Pacientes y método.** Analizamos el patrón de la FA en 300 pacientes hospitalizados, 200 de ellos en el servicio de cardiología y 100 en el de medicina interna. Determinamos su perfil clínico y valoramos los factores que condicionaron el tratamiento terapéutico.

**Resultados.** La forma permanente sólo estuvo presente en el 30% de los pacientes hospitalizados en el servicio de cardiología y en el 51% de los ingresados en el servicio de medicina interna. El patrón de primer episodio fue el más frecuente en los pacientes de cardiología (41%). En éstos hubo un mayor porcentaje de utilización de anticoagulantes que entre los ingresados en medicina interna (57,9 frente a 41%;  $p < 0,01$ ), así como de bloqueadores beta, y un menor uso de digital, si bien en el análisis multivariable el ingreso en cardiología sólo se comportó como un factor predictor independiente de mayor probabilidad de ser tratado con bloqueadores beta (*odds ratio* [OR] = 3,8; intervalo de confianza [IC] del 95%, 1,3-11,1;  $p < 0,05$ ), y el mayor condicionante del uso de anticoagulantes fue haber sido dado de alta en FA (OR = 4,8; IC del 95%, 2,5-9,2;  $p < 0,001$ ).

**Conclusiones.** a) La FA es una arritmia con un patrón clínico heterogéneo y diferente según el nivel asistencial en el que se analice; b) entre los pacientes hospitalizados en el servicio de cardiología, sólo el 30% presenta la arritmia de forma permanente y el primer episodio es el patrón clínico más frecuente, y c) ser dado de alta en FA se ha comportado como el principal determinante del tratamiento terapéutico.

**Palabras clave:** Fibrilación auricular. Anticoagulación. Arritmias.

## ABBREVIATIONS

DM: diabetes mellitus.  
AF: atrial fibrillation.

## INTRODUCTION

Within the last few years, it has been fully recognized that atrial fibrillation (AF) is an important public health problem. It has even been described as an epidemic with significant social implications.<sup>1-3</sup> In addition, it has been acknowledged that AF has implications beyond the boundaries of cardiology and may involve members of all clinical professions. Atrial fibrillation does not always present as a permanent arrhythmia. It may be associated with heterogeneous clinical symptoms that have well-differentiated patterns of presentation that require specific therapeutic approaches. This heterogeneity has been recognized for many years<sup>4</sup> and has been taken into account in the most recent clinical practice guidelines that have been prepared jointly by the European Society of Cardiology (ESC) and the two principal US cardiology societies: the American College of Cardiology (ACC) and the American Heart Association (AHA).<sup>5</sup> In this document, AF is classified into four broad categories: first-episode, paroxysmal, persistent, and permanent AF.

It is not known how the frequency of occurrence of each of these forms of presentation or how differences in patients' clinical profiles are related to the overall pattern of clinical presentation or to the type of healthcare center where treatment is received. In addition, therapeutic recommendations for preventing thromboembolism are aimed at a permanent «intermittent» form of AF, a term that includes both the paroxysmal and permanent types of AF listed in the recent classification.<sup>5</sup>

The aims of our study were to investigate the frequency of occurrence of the different presenting forms of AF in hospitalized patients and to determine the patients' clinical characteristics, the types of therapy administered, and whether there were any differences related to the hospital unit to which patients were admitted. In addition, we tried to identify any situations in daily clinical practice in which it would be difficult to apply the recommendations contained in clinical practice guidelines and consensus documents.

## PATIENTS AND METHODS

We carried out a retrospective review of clinical discharge documentation and, when necessary, of the

full clinical history of 300 patients who were hospitalized in our center with a diagnosis of AF. Patients were included whether or not the reason for admission was related to arrhythmia, and regardless of whether the arrhythmia was diagnosed during the hospital stay or previously.

We identified a group of 200 individuals from a review of 594 consecutive patients who were discharged from the cardiology department in 2002 and another group of 100 individuals from a total of 672 consecutive patients discharged from the department of internal medicine. If a patient was readmitted during the period of analysis, only the first admission was taken into account. As a result, the study primarily concerned patients and not the number of admissions.

We evaluated the presenting clinical characteristics of the arrhythmia in terms of events that had occurred up to the time of admission, without taking subsequent developments into account. We followed the criteria laid down in the above-mentioned clinical guidelines,<sup>5</sup> which propose that the arrhythmia should be classified into one of four categories: first-episode, paroxysmal, persistent, or permanent AF.

The patient was included in the permanent AF group if it could be concluded from his or her clinical history that the arrhythmia was present constantly, and if there was no indication that a return to sinus rhythm could be induced by any clinical procedure. The patient was included in the recurrent paroxysmal AF group if he or she was usually in sinus rhythm and had more than one documented episode of AF which, in all instances, reverted to sinus rhythm without the need for electrical or pharmacological intervention. That is, sinus rhythm returned either spontaneously or after the use of a drug which had only negative dromotropic effects, and usually within 24–48 hours. The patient was included in the recurrent persistent AF group if he or she was predominantly in sinus rhythm and had more than one documented episode of AF that required either an electrical or pharmacological intervention to re-establish sinus rhythm, or if he or she regularly took antiarrhythmic drugs. Finally, the patient was included in the first-episode AF group if, on admission for AF, there was no evidence the clinical history that there had been a previous event that could be classified as first-episode AF.

Data collected on the patients' clinical profiles included age, sex, details of previous thromboembolic disease, discharge status (i.e., in sinus rhythm or AF), and the presence of arterial hypertension, diabetes mellitus (DM), dyslipidemia, left ventricular systolic dysfunction, valvular disease, or heart valve prostheses.

Patients were regarded as having arterial hypertension, DM or dyslipidemia if a history of one of these conditions was described in their medical records or if they had been given treatment aimed at correcting one of these conditions. They were regarded as having

TABLE 1. Patients' clinical characteristics

|                                  | All<br>(n=300) | Cardiology<br>(n=200) | Internal medicine<br>(n=100) | P     |
|----------------------------------|----------------|-----------------------|------------------------------|-------|
| Age, years (mean±SD)             | 73.2±11.5      | 70.3±12.0             | 78.9±7.7                     | <.001 |
| >75 years, %                     | 48             | 37                    | 70                           | <.001 |
| >80 years, %                     | 26.3           | 19.5                  | 40                           | <.001 |
| <65 years, %                     | 26.3           | 25                    | 3                            | <.001 |
| Men, %                           | 49.3           | 54                    | 40                           | <.05  |
| Arterial hypertension, %         | 47.8           | 45                    | 52                           | NS    |
| Diabetes mellitus, %             | 29.8           | 22.1                  | 45                           | <.001 |
| Dyslipidemia, %                  | 12             | 12.6                  | 11                           | NS    |
| Previous thromboembolic event, % | 13             | 7.5                   | 24                           | <.001 |
| Structural heart disease, %      | 37.3           | 40.6                  | 22.0                         | <.05  |
| Discharged in sinus rhythm, %    | 37.5           | 39.7                  | 33                           | NS    |

SD indicates standard deviation; NS, not significant.

left ventricular systolic dysfunction if they had an ejection fraction less than 50%, or if there was any qualitative evidence of this condition in their electrocardiographic records. Patients were said to have previous thromboembolic disease if there was a history of cerebrovascular accident, transient ischemic attack or venous embolism.

In evaluating the treatment administered during the patient's hospital stay or recommended at discharge, we recorded any use of electrical cardioversion, antiarrhythmic drugs, antithrombotic therapy, digitalis, or beta blockers. Differences between the clinical characteristics and the therapeutic management of patients admitted to the cardiology department and those of patients admitted to the department of internal medicine were compared by univariate analysis. Multivariate analysis was used to establish which factors determined therapeutic management and, in particular, whether the patient's hospital department was an important determining factor. The variables analyzed included age, sex, admission to the department of internal medicine, the presence of arterial hypertension, a history of thromboembolic disease, the presence of DM, the presence of structural heart disease, and the presence of AF at discharge.

### Statistical analysis

Quantitative variables are expressed as means±one standard deviation. Qualitative variables are expressed as percentages. Student's *t* test was used to compare unpaired quantitative data and the  $\chi^2$  test was used to compare qualitative variables. Logistic regression analysis was used for the multivariate study, and the variables used for fitting were chosen in accordance with clinical considerations. Odds ratios (OR) and 95% confidence intervals (95% CI) were calculated. For hypothesis testing, *P* values <.05 were regarded as statistically significant.

TABLE 2. Frequency of occurrence of the different presenting clinical forms of atrial fibrillation

|                  | All<br>(n=300) | Cardiology )<br>(n=200) | Internal<br>medicine<br>(n=100) | P     |
|------------------|----------------|-------------------------|---------------------------------|-------|
| First-episode, % | 33             | 41                      | 17                              | <.001 |
| Permanent, %     | 37             | 30                      | 51                              | NS    |
| Paroxysmal, %    | 23             | 20.5                    | 28                              | NS    |
| Persistent, %    | 7              | 8.5                     | 4                               | <.001 |

NS indicates not significant

## RESULTS

Atrial fibrillation was observed in 200 out of 594 consecutive patients (33.7%) admitted to the cardiology department and in 100 out of 672 (14.8%) admitted to internal medicine.

The clinical characteristics of the whole patient group are shown in Table 1. In addition, the characteristics of those admitted to the two hospital departments are shown separately, along with the significance of any differences between those admitted to the different departments. As can be seen from the table, there were significant differences between the groups. Patients admitted to the internal medicine department were significantly older, such that only three were younger than 65 years and 70% were older than 70 years. There were also significant differences in morbidity between the 2 groups, such that the proportion of patients admitted to internal medicine with DM was twice as high, and the proportion of patients with previous thromboembolic disease three times as high as that observed in patients admitted to cardiology. A significantly larger proportion of patients admitted to cardiology had structural heart disease, which was defined as the presence of left ventricular systolic dysfunction, valvular disease or artificial heart valve, or a combination of these factors.

**TABLE 3. Clinical characteristics and pharmacological treatment at discharge in patients admitted to the cardiology department, shown according to the presenting form of the arrhythmia**

|                                       | First-episode | Permanent | Paroxysmal | Persistent |
|---------------------------------------|---------------|-----------|------------|------------|
| Age, years                            | 67±14         | 75±9      | 71±11      | 71±11      |
| Discharged in sinus rhythm, %         | 43.9          | 0         | 75.6       | 70.6       |
| Thromboembolic risk factors absent, % | 9.8           | 1.7       | 17.1       | 5.9        |
| Digitalis, %                          | 32            | 50.9      | 22         | 23.5       |
| Beta-blockers, %                      | 35            | 10        | 12         | 23.5       |
| Antiarrhythmics, %                    | 9.8           | 3.6       | 39         | 70.6       |
| Calcium antagonists, %                | 8.5           | 23.6      | 9.8        | 11.8       |

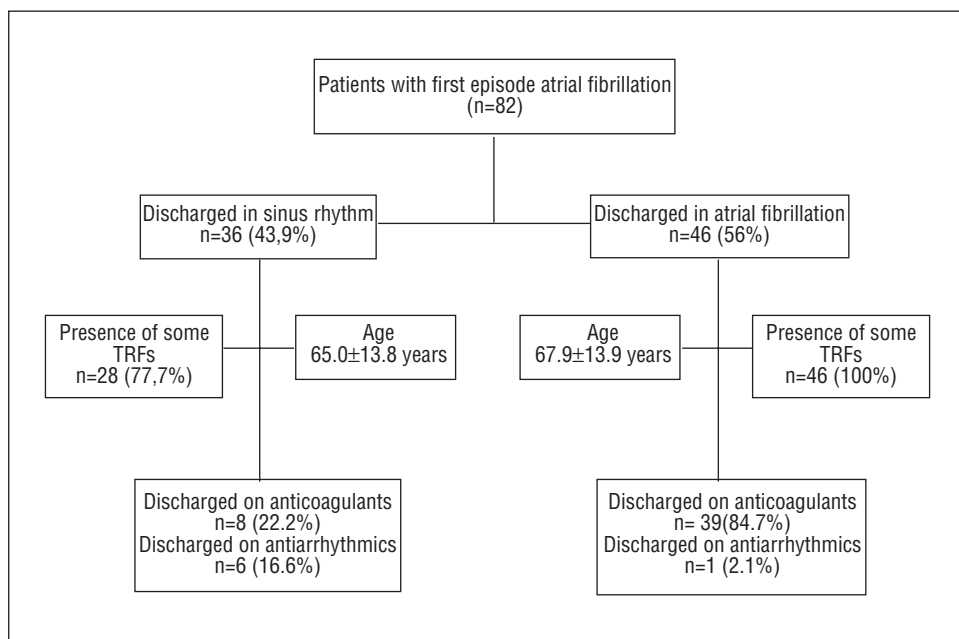
Table 2 summarizes differences in the frequency of occurrence of the presenting forms of arrhythmia between patients hospitalized in the 2 different clinical departments. For patients admitted to cardiology, the most common form of AF was first-episode AF, whereas for those admitted to internal medicine, the predominant form was permanent AF. There were statistically significant differences between the two groups in the proportion of patients with first-episode AF and persistent AF. However, the differences between the groups in the proportion of patients with permanent or paroxysmal AF did not reach statistical significance.

Analysis of the age, clinical characteristics and therapeutic management of the 200 patients admitted to the cardiology department showed that there were differences associated with the presenting clinical form of the arrhythmia (Table 3). Patients with permanent AF

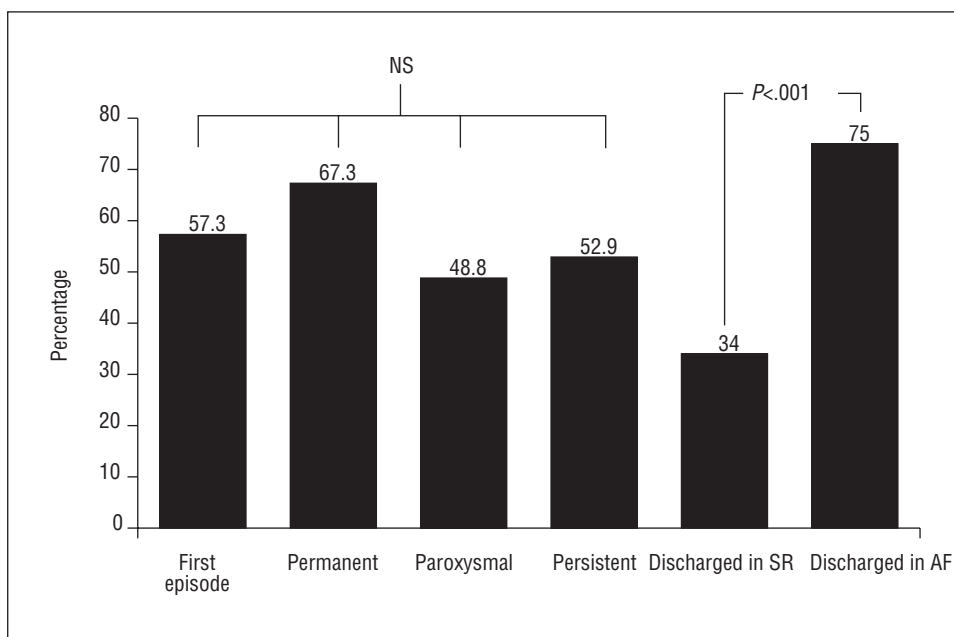
were significantly older than those with first-episode AF. The proportion of patients in whom thromboembolic risk factors were absent also varied according to the presenting clinical form of the arrhythmia. Only one of the 60 (1.7%) patients with permanent arrhythmia had no risk factors compared with seven of the 41 (17%) with paroxysmal AF ( $P<.001$ ). Thromboembolic risk factors were defined as age >65 years, previous thromboembolic disease, a history of arterial hypertension, the presence of DM, and the presence of valvular disease, a prosthetic heart valve, or left ventricular systolic dysfunction. Figure 1 shows the subsequent course in patients with first-episode AF according to their heart rhythm at discharge, with details of the presence of thromboembolic risk factors.

The frequency of use of beta-blockers, digitalis or antiarrhythmics at discharge in patients admitted to cardiology varied according to the presenting form of AF (Table 3). However, when the use of anticoagulant treatment was analyzed separately in these patients (Figure 2), no significant differences were observed between groups with different forms of AF. The presence of AF at discharge was the main factor that determined greater use of this therapy.

No attempt was made to perform pharmacological cardioversion in any of the patients admitted to the cardiology department, and electrical cardioversion was only used on rare occasions. This latter procedure was employed in five patients: 3 had first-episode AF, and 2 had recurrent persistent AF and were receiving regular anticoagulant therapy. In 2 of the 3 patients with first-episode AF, the duration of arrhythmia was less than 48 hours. The third patient had a metallic valve prosthesis



**Fig. 1.** Clinical course in patients who were admitted to the cardiology department with first-episode atrial fibrillation, showing details of heart rhythm at discharge, the presence of thromboembolic risk factors (TRFs), and treatment at



**Fig. 2.** Anticoagulant use in patients admitted to the cardiology department, shown according to the presenting clinical form of atrial fibrillation and according to heart rhythm at discharge. NS indicates not significant; AF, atrial fibrillation;

and was receiving anticoagulant treatment. Eighty percent of patients who had non-permanent AF and who were discharged in AF received anticoagulant therapy. In addition, these patients were given appointments to attend the outpatient clinic within 2 months so that progress could be monitored and electrical cardioversion could be scheduled as necessary.

When the influence of the clinical department on patients' therapeutic management was evaluated by univariate analysis, important differences were observed in the use of therapeutic agents at discharge (Table 4). However, multivariate analysis showed that admission to the internal medicine department was the only independent factor that predicted a reduced likelihood of being treated with beta blockers. The frequency of utilization of the other types of pharmacological therapy was determined by the patients' clinical characteristics, and in particular, by whether they were discharged in sinus rhythm or AF (Table 5).

**TABLE 4. Differences in pharmacological treatment between patients admitted to the internal medicine or cardiology department**

|                     | All  | Internal medicine | Cardiology | P     |
|---------------------|------|-------------------|------------|-------|
| Anticoagulants      | 56.6 | 41                | 57.9       | <.01  |
| Digitalis           | 39.1 | 47.5              | 34.9       | <.05  |
| Beta-blockers       | 23.5 | 8.1               | 31.3       | <.001 |
| Calcium antagonists | 11.2 | 7.1               | 13.3       | NS    |
| Antiarrhythmics     | 16.7 | 19.5              | 11.1       | NS    |

NS indicates not significant.

## DISCUSSION

Our study demonstrated that the prevalence of AF in patients admitted to the hospital is high. Atrial fibrillation is present in one out of three patients admitted to the cardiology department and in one out of seven admitted to internal medicine.

### Presenting clinical pattern of the arrhythmia

The pattern of clinical presentation of the arrhythmia varied according to the admitting hospital department, with the permanent form of AF being most common in

**TABLE 5. Factors determining the use of particular pharmacological treatments at discharge, as determined by multivariate analysis**

|                                   | Odds ratio | 95% confidence interval | P     |
|-----------------------------------|------------|-------------------------|-------|
| <b>Anticoagulants</b>             |            |                         |       |
| Age                               | 0.96       | 0.93–0.99               | <.05  |
| Discharged in atrial fibrillation | 4.88       | 2.58–9.22               | <.001 |
| Arterial hypertension             | 2.25       | 1.17–4.35               | <.05  |
| Presence of SHD                   | 2.08       | 1.06–4.07               | <.05  |
| <b>Digitalis</b>                  |            |                         |       |
| Discharged in atrial fibrillation | 13.36      | 5.78–30.90              | <.001 |
| <b>Beta-blockers</b>              |            |                         |       |
| Admission to cardiology           | 3.86       | 1.34–11.10              | <.05  |
| Absence of SHD                    | 2.41       | 1.17–4.93               | <.05  |
| <b>Antiarrhythmics</b>            |            |                         |       |
| Discharged in sinus rhythm        | 27.31      | 9.11–81.88              | <.001 |
| Presence of SHD                   | 5.45       | 2.04–14.54              | <.01  |

SHD indicates structural heart disease.

those admitted to internal medicine. Among patients admitted to cardiology, only one-third showed this form of presentation and almost half had first-episode AF. Nevertheless, because the number of patients included in the analysis was limited, statistically significant differences were observed only for first-episode and persistent forms of AF.

### First-episode atrial fibrillation

We believe that special attention should be paid to the first-episode form of AF, which is said to occur when the arrhythmia is diagnosed for the first time, irrespective of the preceding or subsequent clinical course. In our study, patients with first-episode AF accounted for almost half of those admitted to the cardiology department, a finding that is in accordance with observations in other similarly designed studies.<sup>6</sup> Just over 50% of these patients were discharged in AF without receiving antiarrhythmic drugs, although the great majority did receive anticoagulants (Figure 1). The intention was that they would later undergo scheduled electrical cardioversion. Thus, generally accepted recommendations for the treatment of these patients were followed despite uncertainties created by the results of recently published studies.<sup>7,8</sup> Consequently, decisions about the most controversial aspects of the management of these patients, such as the use of antiarrhythmic therapy and the duration of antithrombotic therapy after initial treatment, were delayed until cardioversion was carried out, and have not, therefore, been evaluated in this study.

However, therapeutic decisions could not be delayed in patients who presented with first-episode AF and who were discharged in sinus rhythm, a situation that occurred in 36 of the 200 (18%) patients admitted to the cardiology department. Only 22% of these patients were discharged on anticoagulants, with antiarrhythmic therapy being recommended in 17% (Figure 1). These observations could justify a more aggressive approach to initiating such treatment in first-episode AF. It cannot be argued that this patient population has a low thromboembolic risk profile, as more than two-thirds had some risk factors (Figure 1).

The long-established guidelines on providing anticoagulation therapy in patients who undergo cardioversion (i.e., for 3 weeks before and 4 weeks after cardioversion) are currently being reviewed, and among the suggested changes is a proposal that the period of anticoagulation should be prolonged until the possible occurrence of a relapse can be evaluated, especially in those in whom this possibility can be «predicted».<sup>5</sup> However, patients who spontaneously recover sinus rhythm also deserve further consideration because their management depends on the individual approach and the physician's own judgment.

### Anticoagulant use and the presenting form of the arrhythmia

Clinical practice guidelines and recommendations that cover antithrombotic therapy are widely available.<sup>5,9-14</sup> They are based on a large number of studies and clinical trials that were carried out during the 1990s, and are more than adequate for patients who present with permanent arrhythmias. There is also widespread consensus that patients with non-permanent forms of arrhythmia have a similar risk of thromboembolism.<sup>15-18</sup> However, the different groups of patients that have been described as having non-permanent forms of arrhythmia are not always homogeneous. The majority of studies that have investigated this subject have not specified whether patients have paroxysmal or persistent AF, as defined by the current classification. Instead, both forms are included under the term intermittent AF.<sup>15,19-21</sup>

In our study, the persistent form of AF was not very common in hospitalized patients. In addition, thromboembolic risk factors were less frequent in those with the paroxysmal form, although there was no significant difference in the use of anticoagulant therapy between the 2 groups. It may be reasonable to apply the therapeutic recommendations for preventing thromboembolism in patients with permanent AF in situations in which episodes of AF are prolonged and usually not self-limiting, that is, in situations which could be covered by the term persistent AF. However, if we accept that patients in whom arrhythmia persists for less than 48 hours can undergo attempts to restore sinus rhythm with drugs or electrical cardioversion without the need for anticoagulant therapy,<sup>5</sup> we might also ask whether patients with recurrent short self-limiting arrhythmic episodes (i.e., with paroxysmal AF) should be treated according to the same criteria as those with permanent or persistent AF. We believe, therefore, that there is a need for specific recommendations for preventing thromboembolism in patients with non-permanent AF that take into account the differences between the two different clinical forms described in the current classification.

### Difference in patients' clinical profiles and therapeutic management in different hospital departments

We observed differences in the comorbidity reported for arrhythmia by group analysis and were related to where the patients were treated. Thus, patients admitted to the department of internal medicine were older, more had DM or previous thromboembolic disease, and fewer had structural heart disease.

We also observed significant differences in the treatments given to patients admitted to the 2 departments, even after multivariate analysis. However,

being admitted to the cardiology department did not mean that anticoagulant treatment was less likely, because the variations in patient management were attributable to differences in the patients' clinical profiles.

The low level of utilization of cardioversion is attributable to the fact that we were studying a group of patients who had been admitted to the department after being seen by the emergency service, and who had not reverted to sinus rhythm. This implies that only rarely could the duration of the arrhythmia be established as less than 48 hours. On the other hand, all patients with first-episode AF who were discharged in AF had some thromboembolic risk factors. In our opinion, the presence of these thromboembolic risk factors, although not specifically covered by clinical practice guidelines, contraindicates the use of cardioversion without previous anticoagulant therapy.

Finally, in the light of the results of the present study, we feel that we should comment on the value of the studies used to establish recommendations on the number of patients in AF who should receive anticoagulation therapy, and of the studies that have investigated the level of compliance achieved in clinical practice with recommendations for anticoagulation therapy. Within the last few years, numerous studies have been published on these topics, both in Spain<sup>22-26</sup> and in other countries.<sup>27-29</sup> Without doubt, these studies have helped to optimize the use of therapy and have also raised the issue of using anticoagulants in groups of patients in whom their use was unthinkable until recently.<sup>30-32</sup> However, AF is usually regarded as a homogeneous clinical entity, or at best, only permanent and non-permanent forms of the arrhythmia are taken into account.<sup>24,33</sup> Nevertheless, comparisons have sometimes been made between the therapeutic guidelines used in different levels of healthcare.<sup>33-35</sup> As a result, differences in patient management have been attributed to different levels of knowledge or to different approaches to the condition, without taking into account—as our study demonstrates—that patients with AF present with a variety of clinical characteristics. Moreover, these characteristics and the overall clinical picture vary according to the department where patients are treated, and consequently, different therapeutic recommendations and approaches may be required.

### Limitations

The study was retrospective and was carried out at a single center. Therefore, it can only describe the situation at the center where it was carried out, and does not necessarily reflect the general situation. However, the study data do not differ greatly from those provided by the few other available studies.<sup>6</sup> We believe that similar studies carried out in centers with specialized arrhythmia units for patients from cardiology

departments, in primary care centers, in emergency departments, or in cardiology clinics would produce different results.

Although the patients we investigated were hospitalized for arrhythmias that, in most cases, had lasted longer than 24 hours, it was not possible to tell how much time had passed between the start of arrhythmia and reversion to sinus rhythm (when this occurred), because patients were not monitored after transfer from the emergency department to the in-patient department. As a result, it was not possible to evaluate the therapeutic approach used for well-defined clinical situations such as AF of very short duration.

### CONCLUSIONS

The clinical characteristics of AF in hospitalized patients are heterogeneous, and the pattern of clinical presentation varies depending on the hospital department studied. Permanent AF is present in only one-third of the patients admitted to cardiology, and first-episode AF is the most common form of presentation. Being discharged in AF is the main determinant of the therapeutic approach used.

### REFERENCES

1. Ezekowitz MD. Atrial fibrillation: the epidemic of the new millennium. *Ann Intern Med* 1999;131:537-8.
2. Alpert JS. Atrial fibrillation: a growth industry in the 21st century. *Eur Heart J* 2000;21:1207-8.
3. Tsang TS, Gersh BJ. Atrial fibrillation: an old disease, a new epidemic. *Am J Med* 2002;113:432-5.
4. Gallagher MM, Camm J. Classification of atrial fibrillation. *Am J Cardiol* 1998;82:N18-28.
5. Fuster V, Rydén LE, Asinger RW, Cannom DS, Crijs HJ, Frye RL, et al. The ACC/AHA/ESC guidelines for the management of patients with atrial fibrillation. *Eur Heart J* 2001;22:1852-923.
6. Dixon, B, Bracha Y, Loecke SW, Guerrero MA, Taylor RD, Asinger RW. The new atrial fibrillation classification system applied to consecutive patients discharged from an urban hospital [abstract]. *Circulation* 2002;106(Suppl):457.
7. The Atrial Fibrillation Follow-up Investigation of Rhythm Management (AFFIRM) Investigators. A comparison of rate control and rhythm control in patients with atrial fibrillation. *N Engl J Med* 2002;347:1825-33.
8. van Gelder IC, Hagens VE, Bosker HA, Kingma JH, Kamp O, Kingma T, et al. A comparison of rate control and rhythm control in patients with recurrent persistent atrial fibrillation. *N Engl J Med* 2002;347:1834-40.
9. Atrial fibrillation investigators. Risk factors for stroke and efficacy of antithrombotic therapy in atrial fibrillation. Analysis of pooled data from five randomized controlled trials. *Arch Intern Med* 1994;154:1449-57.
10. Heras M, Fernández-Ortiz A, Gómez-Guindal JA, Iriarte JA, Lidón RM, Pérez-Gómez F, et al. Guías de actuación clínica de la Sociedad Española de Cardiología. Recomendaciones para el uso del tratamiento antitrombótico en cardiología. *Rev Esp Cardiol* 1999;52:801-20.

11. Hart RG, Benavente O, McBride R, Pearce LA. Antithrombotic therapy to prevent stroke in patients with atrial fibrillation. *Ann Intern Med* 1999;131:492-501.
12. Albers GW, Dalen JE, Laupacis A, Manning WJ, Petersen P, Singer DE. Antithrombotic therapy in atrial fibrillation. *Chest* 2001; 119:S194-206.
13. Segal JB, McNamara RL, Miller MR, Powe NR, Goodman SN, Robinson KA, et al. Anticoagulants or antiplatelet therapy for non-rheumatic atrial fibrillation and flutter (Cochrane review). En: *The Cochrane Library*, Issue 3, 2003. Oxford: update software.
14. Benavente O, Hart R, Koudstaal P, Laupacis A, McBride R. Oral anticoagulants for preventing stroke in patients with non-valvular atrial fibrillation an no previous history of stroke or transient ischemic attacks (Cochrane review). En: *The Cochrane Library*, Issue 3, 2003. Oxford: update software.
15. Hart RG, Pearce LA, Rothbart RM, McNulty JH, Asinger RW, Halperin JL. Stroke with intermittent atrial fibrillation: incidence and predictors during aspirin therapy. *Stroke Prevention in Atrial Fibrillation Investigators. J Am Coll Cardiol* 2000;35:183-7.
16. Aboaf AP, Wolf PS. Paroxysmal atrial fibrillation. A common but neglected entity. *Arch Intern Med* 1996;156:362-7.
17. Lip GY, Li Saw, Hee FL. Paroxysmal atrial fibrillation. *Q J Med* 2001;94:665-78.
18. Chung MK. Should patients receive anticoagulation for paroxysmal atrial fibrillation? *Cleve Clin J Med* 2000;67:9-10.
19. The SPAF Investigators. The Stroke Prevention in Atrial Fibrillation Study Group Investigators: final results. *Circulation* 1991;84: 527-39.
20. European atrial fibrillation trial study group. Secondary prevention in non-rheumatic atrial fibrillation after ischaemic attack or minor stroke. *Lancet* 1993;342:1255-62.
21. Stroke Prevention in Atrial Fibrillation Investigators. Adjusted-dose warfarin versus low-intensity, fixed-dose warfarin plus aspirin for high-risk patients with atrial fibrillation: stroke prevention in atrial fibrillation III randomised clinical trial. *Lancet* 1996;348: 633-8.
22. Brotons C, Moral I, Anton JJ, Cobos M, Cucurull E, Gállego C, et al. Tratamiento preventivo de la fibrilación auricular no reumática: de la eficacia de los ensayos clínicos a la efectividad en la práctica clínica. *Aten Primaria* 1997;20:367-71.
23. Alonso Roca R, Barroso Muñoz C, Álvarez Solanes I, Alcaraz Bethancourt A, Puche López N, Gordillo López FJ. Situación actual del control de la anticoagulación oral en atención primaria. *Aten Primaria* 1999;24:127-33.
24. Vázquez E, Martín Rubio A, Pousibet H, Lozano C, Guzmán M, Tarabini A, et al. Utilización del tratamiento anticoagulante en los pacientes con fibrilación auricular no reumática. *Rev Esp Cardiol* 2000;53:200-4.
25. Bertomeu V, Morillas PJ, González-Juanatey JR, Alegría E, García-Acuña JM, González-Maqueda I, et al. Empleo de fármacos antitrombóticos en pacientes hipertensos con fibrilación auricular crónica. *Estudio Cardiotens 99. Med Clin (Barc)* 2002;118: 327-31.
26. Vázquez E, Martín Barranco MJ, Martín Rubio A, Fajardo A, Lozano C, Guzmán M, et al. Cambios en el perfil clínico de los pacientes anticoagulados durante la década de los noventa. *Rev Esp Cardiol* 2002;55:55-60.
27. Prevalence of atrial fibrillation and eligibility for anticoagulants in the community. *Lancet* 1998;352:1167-71.
28. Stafford RS, Singer DE. Recent national patterns of warfarin use in atrial fibrillation. *Circulation* 1998;97:1231-3.
29. Brass LM, Krumhol HM, Scinto JM, Radford M. Warfarin use among patients with atrial fibrillation. *Stroke* 1997;28:2382-9.
30. Vázquez E, Sánchez-Perales C, Borrego F, García Cortés MJ, Lozano C, Guzmán M, et al. Influence of atrial fibrillation on the morbido-mortality of patients on hemodialysis. *Am Heart J* 2000; 140:886-90.
31. Abbott KC, Trespalacios FC, Taylor AJ, Agodoa LY. Atrial fibrillation in chronic dialysis patients in the United States: risk factors for hospitalization and mortality. *BMC Nephrol* 2003;4:1. Disponible en: [www.pubmedcentral.gov/articlerender.fcgi?tool=pubmed&pubmed id=12546711](http://www.pubmedcentral.gov/articlerender.fcgi?tool=pubmed&pubmed id=12546711)
32. Vázquez E, Sánchez-Perales C, García-Cortés MJ, Borrego F, Lozano C, Guzmán M, et al. Ought dialysis patients with atrial fibrillation be treated with oral anticoagulants? *Intern J Cardiol* 2003;87:135-9.
33. Lip GY, Zarifis J, Watson RD, Beevers DG. Physician variation in the management of patients with atrial fibrillation. *Heart* 1996; 75:200-5.
34. Brodsky MA, Chun JG, Podrid PJ, Douban S, Allen BJ, Cygan R. Regional attitudes of generalists, specialists and subspecialists about management of atrial fibrillation. *Arch Intern Med* 1996; 156:2553-62.
35. Munschauer FE, Priore RL, Hens M, Castilone A. Thromboembolism prophylaxis in chronic atrial fibrillation. Practice patterns in community and tertiary-care hospitals. *Stroke* 1997;28:72-6.