

Emergency department observation unit: an adequate place for the management of atrial flutter

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None

Background: The Emergency Observation Unit (EOU) plays a central role in the attention and monitorization of patients with urgent conditions. Nevertheless, data regarding the management of atrial flutter at emergency departments are scarce.

Aim: The aim of the present study was to assess the effectiveness of flutter management in patients admitted to the EOU.

Methods: A prospective, descriptive, observational study of all the patients who were initially diagnosed of atrial flutter at emergency department and later transferred to the EOU during 36 consecutive months was carried out.

Results: Among 157 patients (mean age 70 years) included in the study, 110 (71%) were discharged from the EOU, 79% of them within less than 24 hours. The normal heart rhythm was restored with flecainide in 6 cases (4%, effectiveness 67%), propafenone in 4 cases (3%, effectiveness 25%) and amiodarone in 77 cases (49%, effectiveness 53%). Electrical cardioversion was used in 11 cases (7%) with effectiveness of 100% and absence of adverse effects. In 61 cases (38,85%) the electrocardiogram showed sinus rhythm when the patients left the EOU.

Conclusions: The number of patients with atrial flutter discharged from the EOU was high. Pharmacological effectiveness to restore the heart rhythm was low being amiodarone and flecainide the most effective drugs. The number of electrical cardioversion procedures performed for the treatment of atrial flutter in the EOU was low. [Emergencias 2008;20:101-107]

Key words: Emergency room. Atrial flutter. Arrhythmia. Treatment.

Introduction

Atrial flutter is the most frequently encountered arrhythmia in the emergency department (ED) second only to atrial fibrillation (AF). Nonetheless, few data are available in the literature on flutter management in EDs, assuming in many cases that treatment and complications are equal to those of AF^{1,2}.

Atrial flutter consists of a rapid (from 200 to 300 bpm), organised and regular atrial rhythm, presenting an electrocardiographic pattern showing atrial waves with no isoelectric lines between them (F waves) and predominantly negative in II, III aVF in typical patterns. The positive component prevails over the negative in II, II, aVF in atypical patterns. It is possible that all types of flutter ac-

tually begin with a very early atrial impulse which, upon encountering an atrial area with a one-way blockage, a circular movement known as re-entry is begun. When the flutter is typical, the arrhythmia is caused by an anti-clockwise macro-entry in the right atrium^{3,4} while in atypical flutters, depolarization is clockwise. A total of 88 new cases per every 100,000 patients/year⁵ is reported, with a higher risk of atrial flutter among men, the elderly and patients with heart failure or chronic obstructive pulmonary disease⁶. Symptoms depend on ventricular frequency and on the type of structural cardiopathy, ranging from asymptomatic patients to palpitations, dizziness, dyspnoea, weakness, syncope, angina or symptoms of heart failure⁷. A flutter with a rapid ventricular response is not easily controlled by medication with reports the lite-

ature showing very poor results in frequency and rhythm control. The flutter/rapid ventricular response combination is particularly important due to the possibility of atrial thrombosis, which may be emboligenous. Indeed, all clinical practice guides mention the potential danger of a thromboembolic event posed by atrial flutter even in cases with a normal ventricular response⁸⁻¹⁰.

The Emergency department Observation Unit (EOU) is a crucial area for attention and the follow-up of patients admitted in any other emergency area¹¹⁻¹³. It is usually made up of physicians and a nursing team that are part of the ED staff. These are areas that provide additional emergency care, gaining extra time to achieve a more accurate diagnosis, and prevent unnecessary admissions and medical errors. It also helps to reduce other problems that are not specific to the EDs, such as the lack of hospital beds, overcrowding or overspending in healthcare^{14,15}. The EOU at the University Clinical Hospital Lozano Blesa includes 22 beds, 2 of which are isolated and 3 belong to the monitoring area of the unit. It is in the latter where most arrhythmias from the EOU (either from critical or internal medicine examination rooms) are managed and monitored. Atrial flutter is one of the conditions that can be treated in the EOU including subsequent hourly follow-up to ensure overall attention. An action and management protocol was established in this hospital in 1999 for patients with atrial flutter, being subsequently updated in 2003 with the introduction of the SEMES^{16,17} approved clinical practice guidelines based on the patient management guidelines of the American College of Cardiology (ACC), the American Heart Association (AHA) and the European Society of Cardiology (ESC) in 2001¹⁸. The main goal of this study was to assess the efficacy of the management of patients admitted to the EOU of our hospital.

Method

A descriptive, prospective and population-based study was performed in the patients presenting at the ED of the University Clinical Hospital Lorenzo Blesa from healthcare area III from the July 1st, 2003 to May 30th, 2006 (36 months), with a diagnosis of atrial flutter as the main cause for consultation and who were subsequently referred to the EOU for clinical observation and treatment follow-up. Data were taken from the EOU patient admission sheet and the emergency medical history, complemented when required with

data from the general medical history of the patients. Data were compiled by the attending physician following an EOU medical assessment by completing a coded 169-field form. All patients whose emergency medical history could not be located for completing the study form were excluded. Likewise, on review of the clinical history, all cases in whom, arrhythmia had not been the main cause for admission to the EOU were excluded from the study. Epidemiological and clinical data were collected for all the patients included. Anti-arrhythmia and anti-coagulation guidelines (Table 1) recommended at each stage of the study were applied to patients with atrial flutter. The total number of patients with other arrhythmias admitted to the EOU and their medical histories were also included. All data were entered and analysed in a specially designed database via the FileMaker pro 5.0 programme, and were subsequently processed using the SPSS 10.0 statistical programme. The χ^2 test was used for comparison of proportions.

Results

Of the almost 300,000 emergency cases attended within the 36-month study period, 110,000 were admitted to the EOU. Of these, 1,009 were arrhythmias, of which 157 (15.5%) were diagnosed with atrial flutter and were included in the study. The mean age of the patients was 70+11 years with 39% being women. Ninety cases had been referred from urban healthcare centres (57%) and 63 from rural centres (40%). Forty-three patients had arrived at the ED on their own initiative (27%), 79 had been referred by their own primary care physician (50%) and 18 cases had arrived via a mobile intensive care unit (12%). The most frequent medical history symptoms were high blood pressure (HBP) in 80 cases (51%), chronic obstructive pulmonary diseases (COPD) in 34 cases (18%), hyperlipemia in 29 cases (18%), diabetes in 32 cases (20%) and ischaemic heart disease in 17 cases (11%).

The symptoms presented by the patients are shown in Table 2. This table shows that patients with flutter more frequently presented dyspnoea than in other arrhythmias, whereas palpitations or chest pain were less frequent ($p < 0.05$). As for symptom onset, in 121 cases (78%) the symptoms appeared at rest. The most frequent secondary diagnoses were heart failure in 19 cases (13%), acute coronary syndrome in 12 cases (8%) and respiratory infection in 5 cases (3%). Flutter

Table 1. Risk factors (RF) and evolution of the recommendations for the prevention of arterial thromboembolism in atrial flutter

2001*					
High RF	Transitory vascular accident or ischaemic ictus	High blood pressure	Mitral valve disease	Systolic heart failure or ejection fraction below 40%	Age over 75
Moderate RF	Diabetes mellitus	Ischaemic heart disease	Aged over 65		
2006**					
Moderate RF	Age 75 or over	High blood pressure	Heart failure or ejection fraction below 35%	Diabetes mellitus	
High RF	Cerebral vascular accident/permanent/transitory/ or previous embolism	Mitral stenosis	Prosthetic heart valve		

*Recommendations: anticoagulants: 1 or more high RF, 2 or more moderate RF; Antiaggregants: 1 individual moderate RF in each case; antiaggregants: < 65 years with no risk factors.

** Recommendations: under 65 years with no RF: antiaggregants; 1 moderate RF: antiaggregants or anticoagulants at the discretion of the physician; 1 high RF or more than 1 moderate RF: anticoagulants.

was classified as a first episode in 58 cases (37%), paroxysmic in 83 cases (53%), persistent in 2 cases (1%) and permanent in 6 cases (4%). Haemodynamic stability was observed in 154 patients (98%). Of the 3 haemodynamically unstable patients (2%), one underwent electrical cardioversion (ECV) and discharged, another was admitted due to non-control of ventricular frequency and the third received medication and was discharged. The duration of the arrhythmia was less than 48 hours in 72 cases (46%) and greater than 48 hours in 37 (24%), remaining undetermined in 48 cases (30%).

The EOU stay was less than 24 hours in 123 patients (78%) with discharge in 110 cases (71%) and hospital admission in 47 (29%). Upon discharge from the EOU, the ECG showed a sinus rhythm in 61 cases (39%).

Table 3 shows the treatments implemented to control cardiac rhythm, with significant differences being observed in efficacy ($p = 0.01$). For frequency control digoxin was used in 51 cases (32%), calcium antagonists in 59 (38%) and beta-blockers in 15 cases (10%). On five occasions the patients spontaneously recovered sinus rhythm before the initiation of treatment. The treatment given at the EOU was considered unsuitable in only 7 cases (5%), the most frequent cause of unsuitability being the non-use of antiarrhythmic agents for rhythm control in patients with arrhythmia of less than 48 hours (5 cases). Upon discharge, the drugs most frequently prescribed were digoxin in 14 patients (9%), calcium antagonists in 30 (19%) and betablockers in 9 (6%).

With regard to atrioembolic preventive therapy, 53 patients (34%) were already receiving treatment with oral anticoagulants and 42 (26.75%) with antiaggregants. Among the pa-

tients discharged from the EOU (total 110), antiaggregants were prescribed in 9 cases (8.81%) and anticoagulants in 36 (32.72%), with subsequent ECV treatment administered to 20 of these patients.

Discussion

With regard to the epidemiological findings, it should be pointed out that most of the 157 cases of atrial flutter studied involved men, all over the age of 50 years, similar to the results of previous studies^{1,6}. The patients included in the present study were from both urban and rural settings, possibly due to the ageing population in rural areas. Only 11% arrived at the ED via a mobile ICU, a percentage deemed low (most should arrive at the ED via this method), being attributed to the

Table 2. Relationship between the type of arrhythmia (flutter or other arrhythmias included in the study) and the clinical history ($p < 0.05$)

Clinical history	Flutter (n° 157)	Other arrhythmias (n° 852)
Palpitations	91 (57.96%)	500 (63.37%)
Chest pain	35 (22.29%)	239 (30.29%)
Dyspnoea	56 (35.66%)	220 (27.78%)

Table 3. Relationship of treatments used for rhythm restoration and efficacy thereof

Treatments	Used	Efficacy	%
Amiodarone	77	41	53%
Flecainide	6	4	67%
Propafenone	4	1	25%
ECV	11	11	100%

ECV: electrical cardioversion.

fact that many patients are already acquainted with their symptoms and that few patients are clinically unstable. Lastly, with regard to risk factors, arterial hypertension is by far the most frequent among patients with atrial flutter similar to reports in the literature^{1,6,19,20} and being due, in part, to the high prevalence of arterial hypertension/HBP. Nevertheless, the relative risk of having arterial hypertension among flutter patients is lower. COPD is also found in 18% of cases, although the relationship between this arrhythmia and COPD is traditionally acknowledged^{20,21}.

The most common form of onset is at rest as reported in other studies on atrial fibrillation and flutter²³⁻²⁷. The most frequent symptoms were: palpitations 57.96%, dyspnoea 35.66% and chest pain 22.29%, similar to previous results^{1,3,6}. The most frequent secondary diagnoses were congestive heart failure and acute coronary syndrome, mainly in the form of secondary angina. The percentage of patients with dyspnoea was the same as that of patients with COPD or secondary diagnosis of congestive heart failure. Nevertheless, it is of note that despite many patients presenting with chest pain, a diagnosis of secondary angina was made in less than 7% of cases, showing that this clinical symptom is clearly underdiagnosed. Arrhythmias, and therefore flutters, are considered to trigger heart failure, as they can lead to a reduction in the volume per minute and coronary flow depending on the severity. Arrhythmias frequently lead to the first signs of asymptomatic heart failure²⁸⁻³⁰. The relationship between congestive heart failure and flutter has also been reported in the literature^{30,31}.

It is worthy of note that over one third of the patients were admitted to the EOU for a first episode of flutter, with the EOU being the setting in which the initial management was administered, with most of these patients being subsequently discharged and monitored in an outpatient setting. Seventy percent of our patients were discharged which is a high percentage that suggests a good initial disease management and therapy. Six-monthly and yearly follow-ups of patients to record possible complications or recurrence remain to be performed. Among the patients admitted to the EOU with flutter, 78% remained therein for less than 24 hours, demonstrating that EOU admission enables a reduction in hospital stay for patients with this condition.

A high percentage of the electrocardiograms (ECG) performed in the patients prior to discharge from the EOU showed sinus rhythm or variable conduction flutter and, overall, a good fre-

quency control. These last three data (final destination, mean length of stay and ECG at discharge) could not be compared because of the lack of studies analysing this issue. We believe these results are significant and worthy of note as they suggest that the EOU is a suitable setting for the management of this condition. This study will be continued for at least another 3 years, to provide results for comparison with other studies.

The medication used for the treatment of flutter is the same as that prescribed for atrial fibrillation, following the same guidelines and protocols. The duration of arrhythmia is key for making decisions as to the most appropriate flutter therapy^{23,32}. Once haemodynamic stability has been established, the length of the arrhythmia (less than 48 hours) is key to facilitate the decision as to whether rhythm or frequency control therapy should be implemented³⁴⁻³⁹. In terms of rhythm control medication amiodarone was the most frequently used in our study in 49% of cases, followed by flecainide and propafenone. Flecainide was the most successful in achieving sinus rhythm (67%), although 33% did so spontaneously. All studies agree that the rate of cardioversion of the HF group with antiarrhythmic medications is generally low^{40,41} as shown by our own results.

Very few studies have compared the results of the drugs used, although they all agree that the most frequently used and most highly effective drugs are the new group III medications (ibutilide and dofetilide). These drugs are not available in our country but have shown high conversion rates in control studies that range between 50 and 70% depending on the dosage, with few side effects. These are thus the medications of choice for rhythm control of atrial flutters, not just compared with class I agents^{42,43}, but also to sotalol and amiodarone^{44,45}. It should also be pointed out that in the 11 cases in which use of ECV was implemented as rhythm control treatment, the efficacy was 100%, comparable to the results shown in other studies⁴⁶⁻⁴⁸. Consequently, in patients for whom rhythm restoration is recommended, ECV should be the treatment of choice given its high efficacy rate, few side effects⁴⁹ and current lack of any pharmacological treatment for rhythm control that can achieve satisfactory cardioversion levels. In light of the foregoing, ECV should be included as much as possible in the cases for which it is recommended to thereby help to reduce the mean length of hospital stay, prevent number of unnecessary admissions and improve the management of this condition. We believe that the number of

ECVs carried out may be suitable in our setting taking into account that we studied patients admitted to the EOU thereby excluding all the patients who, due to clinical or haemodynamic instability, were referred directly from the ED to the ward or to the intensive care unit (ICU) without passing through the EOU.

With regard to the frequency control drugs, calcium antagonists and digoxin were used in similar percentages, whereas betablockers were used in a significantly lower proportion. These data may be due to the fact that digoxin may be a good initial option for patients presenting signs of heart failure⁶. The literature describes the superiority of calcium antagonists over digoxin in terms of effectiveness and speed of action⁵⁰, as shown in our study. Guidelines are likewise unanimous on the use of betablockers as they improve quality of life and extend survival¹⁷.

Discharged patients were prescribed various drugs for frequency control. Fourteen patients (9%) were given digoxin, 30 (19%) calcium antagonists and 9 (6%) received betablockers. The high number of patients receiving calcium antagonists may be due, among other reasons, to the associated COPD often found in flutter patients, as we have already mentioned, and calcium antagonists are especially recommended for this type of patient due to their added broncho-dilatory effect^{8,51}. Another fundamental aspect in the treatment upon discharge of flutter is the prevention of thromboembolic disease. The literature defines risk groups similar to those established for atrial fibrillation, leading to the use of anticoagulants in a way similar to that used in such patients⁹.

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Sala de observación de un servicio de urgencias: un lugar adecuado para el manejo del *flutter* auricular

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Introducción y objetivos: La sala de observación de urgencias (SOU) es uno de los pilares fundamentales para la atención y control de la patología urgente. Existe muy poca información acerca del manejo del *flutter* en urgencias. Nuestro objetivo es ver la eficacia del manejo en los pacientes con *flutter* ingresados en la SOU.

Método: Durante 36 meses consecutivos se realizó un estudio observacional, descriptivo y prospectivo de los pacientes diagnosticados de *flutter* en urgencias y que posteriormente pasaron a la SOU.

Resultados: Se incluyen 157 pacientes (edad media 70 años), de los que 110 (71%) son dados de alta, y el 79% de ellos en menos de 24 horas. Para restaurar el ritmo se emplea la flecainida en 6 casos (4%) con una efectividad del 67%, la propafenona en 4 casos (3%), con una efectividad del 25% y la amiodarona en 77 casos (49%) con una efectividad del 53%. En 11 casos (7%) se realiza cardioversión eléctrica, y es efectiva en un 100% sin efectos secundarios. Cuando abandonaron la SOU, 61 casos (38,85%) presentaban un electrocardiograma con ritmo sinusal.

Conclusiones: Un gran número de pacientes con *flutter* auricular reciben el alta desde la SOU. Sin embargo, la efectividad farmacológica en la restauración del ritmo es baja, siendo la amiodarona el fármaco más empleado y la flecainida el más efectivo. La cardioversión eléctrica en la SOU es baja. [Emergencias 2008;20:101-107]

Palabras clave: Sala de observación de urgencias. *Flutter* auricular. Arritmia. Tratamiento.