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*Atrial fibrillation (AF) among patients of the Department
of Cardiology in Lublin*

Atrial fibrillation (AF) is the most common cardiac arrhythmia (1). AF is a supraventricular tachyarrhythmia characterized by uncoordinated atrial activation with consequent deterioration of atrial mechanical function. On the electrocardiogram (ECG), AF is characterized by the replacement of consistent P waves by rapid oscillations or fibrillatory waves that vary in amplitude, shape, and timing, associated with an irregular, frequently rapid ventricular response when atrioventricular (AV) conduction is intact (2). The ventricular response to AF depends on electrophysiological (EP) properties of the AV node and other conducting tissues, the level of vagal and sympathetic tone, the presence or absence of accessory conduction pathways, and the action of drugs (3). AF is often associated with structural heart disease, although a substantial proportion of patients with AF have no detectable heart disease. AF may occur in isolation or in association with other arrhythmias, most commonly atrial flutter or atrial tachycardia (4).

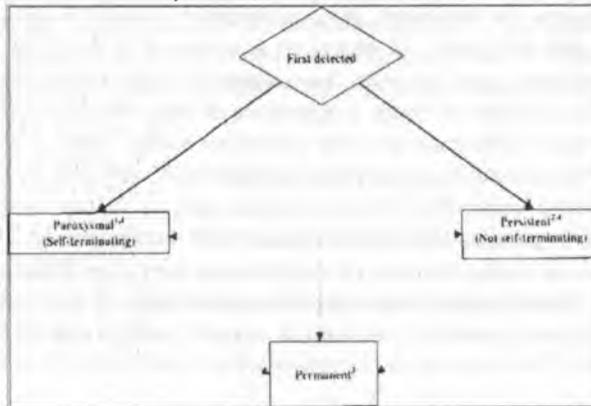


Fig. 1. Patterns of atrial fibrillation (AF). 1 – Episodes that generally last 7 d or less (mostly less than 24 h); 2 – episodes that usually last longer than 7 d; 3 – cardioversion failed or not attempted; and 4 – both paroxysmal and persistent AF may be recurrent

The clinician should distinguish a first-detected episode of AF, whether or not it is symptomatic or self-limited, recognizing that there may be uncertainty about the duration of the episode and about previous undetected episodes (Fig. 1). When a patient has had two or more episodes, AF is considered recurrent. If the arrhythmia terminates spontaneously, recurrent AF is designated paroxysmal; when

sustained beyond 7 days, AF is designated persistent. Termination with pharmacological therapy or direct-current cardioversion does not change the designation. First-detected AF may be either paroxysmal or persistent AF. The category of persistent AF also includes cases of long-standing AF (e.g., greater than one year), usually leading to permanent AF, in which cardioversion has failed or has not been attempted (1).

AF is the most common arrhythmia in clinical practice, accounting for approximately one-third of hospitalizations for cardiac rhythm disturbances. The estimated prevalence of AF is 0.4% to 1% in the general population, increasing with age (5). AF is associated with an increased long-term risk of stroke, heart failure (HF), and all-cause mortality, especially in women (6). The mortality rate of patients with AF is about double that of patients in normal sinus rhythm and linked to the severity of underlying heart disease (7).

AF has a heterogeneous clinical presentation, occurring in the presence or absence of detectable heart disease. An episode of AF may be self-limited or requires medical intervention for termination. Main causes of AF are: arterial hypertension, ischemic heart disease (especially heart infarction), valvular disease, hyperthyreosis, cardiomyopathy, congenital heart disease, myocarditis, stimulants.

MATERIAL AND METHODS

The study was carried out among group of 100 patients (58 men, 42 women) with atrial fibrillation admitted to the Department of Cardiology, Medical University of Lublin from October 2003 to June 2004. The mean age was 77 years (from 39 to 91). We based on specially prepared queries including anamnesis, cases history and order charts. The diagnosis of AF was based on history and clinical examination and confirmed by 12-lead ECG recording. All patients were on bedside ECG monitoring. All of them were given intravenous infusion of KCl and magnesium in 5% glucose or 0.9% NaCl. We estimated coexisting diseases, risk factors and pharmacological therapy. The statistical analysis was carried out by means of the t-Student test.

RESULTS

Among diseases and factors predisposing patients to AF the most common were: arterial hypertension (68 patients), ischemic heart disease (61 patients), valvular disease (20 patients). In this group were 37 patients with implantable pacemaker, mainly because of brady-tachycardia syndrome. We also observed the prevalence of hyperlipidemia (30 patients), heart failure (21 patients), diabetes mellitus type 2 (11 patients), hyperthyreosis (15 patients), hypothyreosis (7 patients). Dysfunction of thyroid gland was induced by amiodaron intake in most cases. 68 patients were overweight or obese (BMI > 30). 33 were smokers (about 30/per day during the last year).

The beginning of AF could be connected with vagal factors in 26 cases, adrenergic factors in 18 patients, fluctuation of hypertension in 3 cases. We could not determine "trigger factor" of AF in 53 persons.

In the study population AF occurred usually (42%) every few months. Other patients had recurrence of AF every few weeks, or few times a week, (19% and 15%, respectively). 10 patients had first detected AF in their life. The most common symptoms during AF were: weakness (68%), palpitations (65%), dyspnea (56%), sweating (40%), vertigo (39%), chest pain (33%), fear (33%), polyuria (29%), syncope (14%). 8% of patients were asymptomatic.

Clinical management is based on the presumption that thrombus formation requires continuation of AF for approximately 48 hours. Most of the patients (60%) were admitted to the hospital within 24 hours from AF beginning (22 persons within first 12 hours, 38 patients within next 12 hours).

27 patients were admitted after 48 hours of continued AF and 11 patients were unable to detect the beginning of this arrhythmia. 67 patients were on permanent oral anticoagulation (INR range of 2.0 to 3.0). Some patients were permanently treated by unfractionated heparin or higher doses of aspirin (300-325mg daily) – 8 and 7 patients respectively.

The most common antiarrhythmic drugs used permanently by patients were: propafenone (47%), amiodarone (31%) and sotalol (15%), dizopiramid (6%) and prajmaline (1%). Amiodaron had the greatest potential of sinus rhythm restoration, but it was also the main cause of hyperthyreosis in our study.

In order to convert AF to sinus rhythm in our patients we performed pharmacological or electrical cardioversion. Our pharmacological cardioversion (apart from intravenous infusion of KCl and magnesium in 5% glucose or 0.9% NaCl) was based on oral application of propafenone (150 or 300 mg – dose dependent on body mass). This treatment resulted in recurrence of sinus rhythm in 22 patients. The most effective way of sinus rhythm restoration was electrical cardioversion, which was successful in 69 patients. We repeated electrical cardioversions to successful sinus rhythm restoration, up to three times. The most frequently used energy of direct-current successful cardioversion was 100 J (19 patients), 200 J (19 patients) and 75 J (15 patients). Other energies of electrical cardioversions were rare – 30 J (2 patients), 50 J (2 patients), 120 J (4 patients); 150 J (3 patients), 360 J – (4 patients). We also performed one transesophageal electrical cardioversion (20 J) which successfully restored sinus rhythm.

DISCUSSION

AF may be categorized as paroxysmal (self-terminating), persistent (requiring electrical or pharmacological termination), or permanent. The duration since onset may be known or unknown in an individual patient depending upon the presence or absence of specific symptoms or ECG documentation of the arrhythmia (1).

Management of patients with AF involves 3 objectives – rate control, prevention of thromboembolism, and correction of the rhythm disturbance. The initial management decision involves primarily a rate-control or rhythm control strategy. Under the rate-control strategy, the ventricular rate is controlled with no commitment to restore or maintain sinus rhythm. On the other hand the rhythm-control strategy attempts restoration and/or maintenance of sinus rhythm. The latter strategy also requires attention to rate control. Depending on the patient's course, the strategy initially chosen may prove unsuccessful and the alternate strategy is then adopted (1).

According to that some patients with persistent or permanent AF become accommodated to a poor state of health, they may feel markedly better once sinus rhythm is restored. In contrast, other patients have no or minimal symptoms during AF and restoration of sinus rhythm would not change their functional status (1). In most cases the need of sinus rhythm restoration is natural and pathophysiologically valid, because of heart remodelling induced by long-term AF (11).

As we know from the prior studies, initial presentation of AF may be an embolic complication or exacerbation of HF, but most patients complain of palpitations, chest pain, dyspnea, fatigue, or syncope. In our study for most of the patients it was not the first episode of AF and they well recognized the most typical symptoms like: weakness, palpitations, dyspnea (present among 2/3 of our group). Other disorders included sweating, vertigo, chest pain, fear and polyuria and were present among 30–40% patients only, but they were alarming for patients. Syncope (only in 14 our patients) is an uncommon complication of AF that can occur upon conversion to sinus rhythm in patients with sinus node dysfunction or because of rapid ventricular rates in patients with HCM, valvular aortic stenosis, or when an accessory pathway is present (1).

In our study most of the patients (62 persons) were admitted to the hospital within 48 hours from AF beginning (22 persons within first 12 hours, 38 patients within next 12 hours, 2 patients within next 24 hours). 27 patients were admitted after 48 hours of continued AF and 11 patients were unable to detect the beginning of this arrhythmia. For patients with symptomatic AF lasting many weeks, initial therapy was anticoagulation and rate control, while the long-term goal will be to restore sinus rhythm. The most common antiarrhythmic drugs used permanently by patients were: propafenon, amiodarone and sotalol. Some patients were treated with dizopiramid and prajmalina. Among all antiarrhythmics amiodarone had the greatest potential of sinus rhythm restoration, but it was also the main cause of thyroid gland dysfunction. In our study we had 15 patients with hyperthyreosis and 7 with hypothyreosis thyroid gland were induced by amiodaron intake in most cases.

67 patients in our study was on permanent oral anticoagulation (INR range of 2.0 to 3.0). Some patients were permanently treated by unfractionated heparin or higher doses of aspirin (300–325 mg daily) – 8 and 7 patients respectively. The efficacy and safety of oral anticoagulation and platelet inhibitor therapy with aspirin for prevention of stroke in patients with AF have been well characterized (8). Estimating the risk of stroke for individual AF patients is crucial for the decision to provide anticoagulation therapy to individual patients with AF (9). Although the schemes for stratification of stroke risk identify patients who benefit most and least from anticoagulation, the threshold for use of anticoagulation is controversial. Aspirin offers only modest protection against stroke for patients with AF. Maximum protection against ischemic stroke in AF is probably achieved at an INR range of 2.0 to 3.0 (10).

The need for cardioversion may be immediate when the arrhythmia is the main factor responsible for acute HF, hypotension, or worsening of angina pectoris. Cardioversion may be achieved by means of drugs or electrical shocks. Drugs were commonly used before direct-current cardioversion became a standard procedure (1). We attempt the pharmacological sinus rhythm restoration in almost all patients. Our pharmacological cardioversion based on oral application of propafenon (150 or 300 mg – dose dependent on body mass). This treatment resulted in recurrence of sinus rhythm in 22 patients. The development of new drugs has increased the popularity of pharmacological cardioversion, but the disadvantages include the risk of drug-induced *torsades de pointes* or other serious arrhythmias. That is why amiodarone was not used for pharmacological cardioversion.

Pharmacological cardioversion is less effective than direct-current cardioversion. The initial energy may be low for cardioversion of atrial flutter, but higher energy is required for AF (1). In our study electrical cardioversion was successful in 69 patients. We repeated electrical cardioversions to sinus rhythm restoration, up to three times. The most frequently used energy of transthoracal direct-current successful cardioversion was 100 J (19 patients), 200 J (19 patients) and 75 J (15 patients). Current may be delivered not only through external chest wall electrodes, but also through an internal cardiac electrode (1). We performed only one transesophageal electrical cardioversion (20J) which successfully restored sinus rhythm.

Our results are in accordance with previous studies from the Department of Cardiology, Medical University of Lublin (12).

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SUMMARY

Atrial fibrillation (AF) is the most common cardiac rhythm disturbance. AF may be categorized as paroxysmal, persistent, or permanent. Management of patients with AF involves 3 objectives – rate control, prevention of thromboembolism, and correction of the rhythm disturbance. The study was carried out among the group of 100 patients (58 men, 42 women, mean age 77) with atrial fibrillation admitted to the Department of Cardiology Medical University of Lublin from October 2003 to June 2004 in order to restore sinus rhythm. All of them were given intravenous infusion of KCl and magnesium, and then performed pharmacological (propafenon 150 or 300 mg) or electrical cardioversion. We estimated coexisting diseases, risk factors and pharmacological therapy. The statistical analysis was carried out by means of the t-Student test. Diseases underlying AF were: arterial hypertension (68), ischemic heart disease (61), valvular disease (20). Most patients (60) were admitted to the hospital within 24 hours from AF onset, 27 patients after 48 hours and 11 patients were unable to detect the onset of this arrhythmia. 67 patients were on permanent oral anticoagulation. Pharmacological and electrical cardioversion was effective in 22 and 69 patients, respectively. We repeated electrical cardioversions, up to three times, if necessary. Most frequently used energy of direct-current successful cardioversion was 75 J, 100 J, 200 J. The main cause of AF were: arterial hypertension, ischemic heart disease and valvular disease. Direct-current cardioversion is more effective than pharmacological cardioversion (91% versus 22%).

Migotanie przedsionków u pacjentów Kliniki Kardiologii w Lublinie

Migotanie przedsionków jest najczęściej spotykaną tachyarytmią nadkomorową. Klasyfikuje się je jako napadowe, przetrwałe lub utrwalone. Istnieją trzy główne cele postępowania z pacjentami z migotaniem przedsionków – kontrola częstości rytmu, prewencja powikłań zakrzepowo-zatorowych i przywrócenie rytmu zatokowego. Badanie zostało przeprowadzone w grupie 100 pacjentów (58 mężczyzn i 42 kobiet, średni wiek 77 lat) z migotaniem przedsionków, przyjmowanych do Katedry i Kliniki Kardiologii Akademii Medycznej w Lublinie od października 2003 r. do czerwca 2004 r. w celu przywrócenia rytmu zatokowego. Wszyscy pacjenci otrzymali dożylnie wlewy 0.9 % NaCl + 3g KCl + 2.0 mg MgSO₄, a następnie zostali poddani kardiowersji farmakologicznej (150 lub 300 mg propafenonu p.o.) lub elektrycznej. Pacjentów oceniano pod względem chorób współistniejących, czynników ryzyka oraz stosowanej farmakoterapii. Analizę statystyczną przeprowadzono w oparciu o test t-Studenta. Najczęstszymi chorobami współistniejącymi były: nadciśnienie tętnicze (68), choroba niedokrwienna serca (61), wada zastawkowa serca (20). Większość pacjentów (60) została przyjęta do szpitala w ciągu 24 godzin od napadu migotania przedsionków, 27 pacjentów po 48 godzinach, a 11 nie było w stanie określić początku jego wystąpienia. 67 pacjentów na stałe przyjmowało doustne leki przeciwkrzepliwne. U 22 pacjentów przywrócono rytm zatokowy za pomocą kardiowersji farmakologicznej, a u 69 pacjentów po kardiowersji elektrycznej. Kardiowersję elektryczną powtarzano maksymalnie trzy razy. Najczęściej stosowano energie 75 J, 100 J i 200 J. Najczęstszymi przyczynami migotania przedsionków są: nadciśnienie tętnicze, choroba niedokrwienna serca i wady zastawkowe serca. Kardiowersja elektryczna jest skuteczniejszym sposobem przywracania rytmu zatokowego niż kardiowersja farmakologiczna.