

Clinical management of arrhythmias in elderly patients: results of the European Heart Rhythm Association survey

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The purpose of this survey was to assess clinical practice in management of cardiac arrhythmias in elderly patients (age ≥ 75 years) in the European countries. The data are based on an electronic questionnaire sent to the European Heart Rhythm Association Research Network members. Responses were received from 50 centres in 20 countries. The results of the survey have shown that management of cardiac arrhythmias is generally in accordance with the guidelines and consensus recommendations on management of cardiac arrhythmias, although there are some areas of variation, especially on age limit and exclusion of elderly patients for anticoagulation, ablation, and device therapy.

Keywords

Elderly • Arrhythmia • Anticoagulation • Antiarrhythmic drugs • Ablation • Pacemaker • Implantable cardioverter-defibrillator • Cardiac resynchronization therapy

Introduction

The populations of elderly patients are increasing in Europe. Although guidelines related to cardiac arrhythmia therapies have been updated continually, there are no existing recommendations of treatments for elderly patients.^{1–9} In clinical practice, the adhesion to recommendations of evidence-based guidelines in the management of heart rhythm disorders in elderly patients (age ≥ 75 years) could obviously be influenced by geriatric pathophysiological factors, which are infrequently encountered in the non-elderly adult population.

This survey aims at obtaining information on Europe-wide clinical practice in the management of arrhythmias in elderly patients with emphasis on anticoagulation, pacemaker, cardiac resynchronization therapy (CRT), implantable cardioverter-defibrillator (ICD) and ablation therapies.

Methods and results

The survey was based on an electronic questionnaire sent out to the European Heart Rhythm Association (EHRA) Research Network.

Responses were received from 50 centres in 20 countries and of these, 78.0% were university hospitals, 6.0% private hospitals, and 16.0% other type of hospital. Twenty-four centres (48.0%) treated ≥ 400 elderly patients per year, 9 (18.0%) treated 200–400, 13 (26.0%) 100–200, and 4 centres (8.0%) treated 1–100 elderly patients per year, respectively.

Results

Anticoagulant therapy in patients with atrial fibrillation

For evaluation of risk of stroke, 45 (90.0%) centres use the CHA₂DS₂-VASc score, 3 (6.0%) centres prefer the CHADS₂ score, and 2 (4.0%) centres employ both scores. No age limit has been set up for anticoagulant therapy in 47 (94.0%) centres. An age limit of 85–92 years is employed for not prescribing anticoagulants for 3 (6.0%) respondents. Interestingly, when age (older than 75 years) is the only factor for predicting stroke in patients with atrial fibrillation (AF), only 44 (88.0%) respondents would prescribe anticoagulants to patients. On an average, 19.2% of elderly AF patients are not

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anticoagulated with a vitamin K antagonists (VKAs) or non-vitamin K oral anticoagulants (NOACs) even if there is an indication. The distribution of percentage of elderly AF patients not receiving any anticoagulant therapy is shown in *Figure 1*. The main reasons for not prescribing anticoagulants were high risk for bleeding (72.0% centres), patient or family's choice (48.0% centres), decreased renal function (32.0%), and decreased liver function (14.0%). This question was deemed irrelevant by four (8.0%) centres.

For long-term anticoagulant therapy, VKA was still the first-choice agent for elderly AF patients in 31 (62.0%) centres, while the use of NOACs was preferred in 19 (38.0%) centres. None of the centres have chosen single or double antiplatelet therapy or low-molecular-weight heparin for elderly AF patients. If radiofrequency ablation was employed for AF treatment, VKA, NOACs, and aspirin were chosen prior to the procedure in 38 (76.0%), 11 (22.0%), and 1 (2.0%) centres, respectively. After AF ablation, 32 (64.0%) centres chose VKA for anticoagulant therapy, and 18 (36.0%) centres used NOACs. Low-molecular-weight heparin or antiplatelet therapy had not been chosen in any centre.

The choice of antiarrhythmic drug in elderly patients

Unexpected adverse effects may occur when antiarrhythmic drugs are administered to elderly patients.¹⁰ Several antiarrhythmic drugs would raise concern related to prescription to elderly patients with arrhythmias: flecainide in 26 (52.0%) centres, amiodarone in 15 (30.0%), digitalis in 13 (26.0%), dronedarone in 11 (22.0%), β -blocker in 9 (18.0%), calcium channel blocker in 8 (16.0%), adenosine in 4 (8.0%), and none of above drugs were concerned in 12 (24.0%) centres.

Ablation therapy in elderly patients

The questions regarding ablation therapy were answered by 49 centres. The distribution of arrhythmias for catheter ablation in elderly patients varied from centre to centre with average percentage: atrioventricular nodal re-entrant tachycardia ablations in 18.8% (in 48 centres), accessory pathway ablations 7.2% (47 centres), His bundle ablations (for rate control) 17.0% (48

centres), AF ablations 18.6% (46 centres), atrial tachycardia/flutter ablations 27.7% (49 centres), and ventricular arrhythmia ablations in 10.7% (48 centres), respectively. The age limits for catheter ablation are demonstrated in *Table 1*. There was no age limit for supraventricular tachycardia ablation in most centres. On the contrary, the age limit was set for complicated ablation procedures in many centres, especially for AF ablation. Corresponding to the age limit, ablation therapy was rejected in a proportion of patients (*Table 2*). The main reasons for withholding ablation therapy included high risk for procedure-related complications (83.7%), patient/family's refusal (44.9%), high risk of stroke/transient ischaemic attack (32.7%), high risk of bleeding (22.5%), and impaired renal function (12.2%). This was not deemed relevant by 5 (10.2%) respondents. Regarding the difference in complication rates between the elderly and younger patients, 16 (32.6%) respondents believed there was no difference between two groups, 31 (63.3%) reported a higher complication rate in the elderly group, and 2 (4.1%) respondents considered that the complication rate was lower in the elderly group. Fourteen (28.6%) centres indicated there was no influence of age on ablation results. However, 12 (24.5%) centres reported lower success rates in elderly patients, the other 23 (46.9%) centres suggested that it was dependent on the type of arrhythmia, and none of the centres demonstrated a higher success rate in elderly patients.

Device implantation in elderly patient

Forty-nine centres replied to the questions about device implantation in elderly patient. The age limits for device implantation are presented in *Table 1*. There was no age limit for pacemaker implantation in any of the responding centres, but the age limit was set for CRT and ICD implantation in many centres. Notably, a number of centres had more restrictive age limit for primary prevention ICD than that for secondary prevention. Accordingly to the age limit, some patients were refused device implantation (*Table 2*). The main reasons for not receiving a device were patient/family's choice (55.1%), high

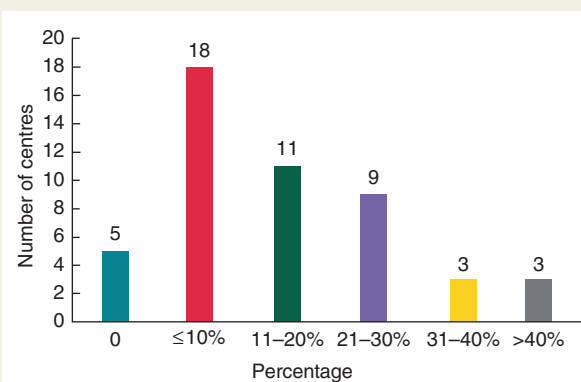


Figure 1 The distribution of percentage of elderly AF patient with indication but not taking anticoagulants in different centres.

Table 1 Age limits for different therapies in elderly patients (% of centres)

	75 years	80 years	85 years	None
Catheter ablation				
Supraventricular tachycardia	0	2.0	8.2	89.8
Ventricular arrhythmias	2.0	18.4	14.3	65.3
AF	32.6	34.7	14.3	18.4
Device implantation				
Pacemaker	0	0	0	100
CRT	0	8.3	20.8	70.8
ICD for primary prevention	18.4	32.6	30.6	18.4
ICD for secondary prevention	0	12.2	12.2	75.5

CRT, cardiac resynchronization therapy; ICD, implantable cardioverter-defibrillator.

Table 2 Distribution of proportions of elderly patients who were not receiving the indicated therapies (% of centres)

	<5%	5–10%	10–20%	20–30%	30–40%
Catheter ablation					
Supraventricular tachycardia	60.4	29.2	2.1	6.2	2.1
Ventricular arrhythmias	38.3	25.5	8.5	14.9	12.8
AF	24.5	14.3	16.3	12.2	32.7
Device implantation					
Pacemaker	98.0	2.0	0	0	0
CRT	53.1	22.4	10.2	8.2	6.1
ICD for primary prevention	20.4	20.4	22.5	16.3	20.4
ICD for secondary prevention	55.1	22.5	18.4	2.0	2.0

Abbreviations as indicated in Table 1.

risk of procedure-related complications (42.9%), high risk of bleeding (10.2%), impaired renal function (8.2%), and high risk of stroke or transient ischaemic attack (4.1%). This was not relevant for 12 (24.5%) respondents. With respect to the complication rates of device implantation, 25 (51.0%) centres indicated no difference between the elderly and young patients, 22 (44.9%) centres suggested higher complication rates in the elderly patients, and 2 (4.1%) centres showed lower complication rates in the elderly patients.

Discussion

Treatment of arrhythmias in elderly patients is often complicated, and clinical dilemma may often be encountered because of decreasing physiological functions, multiple comorbidities, polypharmacy, and side effects. Through this survey, four aspects relating to arrhythmia therapy were investigated. The status of daily practice in elderly patients in Europe was partly revealed.

Anticoagulation

Compared with CHADS₂ score, CHA₂DS₂-VASc score further refines the risk estimation by including the most common risk factors of stroke in clinical practice. Thus, it may help to identify 'truly low-risk' patients with AF and may perform better than CHADS₂ score in identifying patients who have high risk of developing stroke and thromboembolism. For this reason, CHA₂DS₂-VASc score can help us to avoid unnecessary anticoagulant therapy.¹¹ The majority, 94% of the centres employed the CHA₂DS₂-VASc score for evaluating the risk of stroke in patients with AF in accordance with the recommendations of updated guidelines.^{1,2,11} Although guidelines point out that the assessment of bleeding risk should not be used to exclude patients from anticoagulant therapy,^{1,11} 45 (90.0%) centres may withhold anticoagulant therapy from some patients with formal indications, based on various reasons including

the perceived high risk of bleeding, patient's preference, and impaired renal and/or liver function. This is consistent with previous reports in the elderly population.¹² More than half centres preferred VKA as the anticoagulant for either long-term therapy or peri-procedural management. Although promising results from clinical trials showed that NOACs did not cause excess bleeding and were associated with equal or greater efficacy than VKA,^{3,8} NOACs have yet not completely replaced VKA in clinical practice. This was consistent with the results of the earlier EHRA survey.⁹ Nevertheless, none of the centres reported using an antiplatelet agent for long-term anticoagulant therapy in accordance with the guidelines and existing evidence.^{1,11,13}

Antiarrhythmic treatment

Although catheter ablation has been widely used, antiarrhythmic drugs still play a key role in treatment of arrhythmia, especially in long-term therapy.¹⁰ However, the adverse effects of antiarrhythmic drugs may frequently occur in elderly patients. In this survey, flecainide and amiodarone have raised more concerns from physicians, while attention has also been drawn to dronedarone, β -blocker, calcium channel blocker, and digitalis. The result may reflect the apprehension of physicians when prescribing antiarrhythmic drug therapy to the elderly patients because of the proarrhythmic effects and other side effects of drugs in this population.¹⁴

Ablation

Most centres adopted a cautious attitude to AF ablation in elderly patients. Only 18.4% of centres applied ablation for AF patients without age limitation, compared with supraventricular tachycardias (89.8%) and ventricular arrhythmias (65.3%). Similar results were observed in the proportion of patients refused ablation (Table 2). More than 10% of the patients were rejected for AF ablation in 61.2% of centres, meanwhile, $\leq 10\%$ of patients were rejected for supraventricular tachycardias and ventricular arrhythmias in 89.6% and 63.8% of centres, respectively. This may relate to complicated and time-consuming procedure and relatively high recurrence of AF after ablation. It may play an important role that the long-term results of AF ablation in the elderly patients have not been extensively studied.¹⁵ The decision of patient or family for therapy has great impact on clinical practice. Although there are still inconsistent data showing that elderly patients are, or not associated with a higher rate of procedure-related complications,^{16–18} 83.7% of centres would not perform ablation for some elderly patients based on own experience, with which higher complication rate in elderly group was suggested in 63.3% of centres. At the same time, most centres deemed that age would not have impact on the success rate of ablation.

Device implantation

In elderly patients with indications of pacemaker implantation, no centre has defined any limit of age. For CRT and ICD secondary prevention, most centres also administer treatments without any age limit. These may be based on the facts that elderly patients will definitely acquire benefits from the therapies. In contrast, most centres were cautious when offering ICD primary prevention and have considered the patient's age, even if recommendations of guidelines did not give any age limit for ICD primary prevention.^{4,19} With the

same trend, more patients were not accepted for ICD therapy for primary prevention. This demonstrated the adherence to recommendations of evidence-based guideline.⁴ Higher complication rates in the elderly patients were suggested in 44.9% of centres, thus nearly half the centres would not perform device implantation at a certain age limit. Similarly as with ablation, the patient's preference became another main issue for withholding the device implantation.

As we all know, because of under-representation of the elderly in clinical trials, much of the evidence for arrhythmia therapies in the general population cannot be applied completely in elderly patients. Therefore, clinical trials to further define the efficacy and safety of all therapy strategies for arrhythmias in elderly patients are demanded.

Conclusion

The results of this survey show variation in clinical practice, especially on age limit and exclusion of elderly patients for anticoagulation, ablation, and device therapy. The management of arrhythmias in elderly patients is generally in accordance with guidelines and consensus recommendations.

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References

1. Camm AJ, Kirchhof P, Lip GY, Schotten U, Savelieva I, Ernst S *et al.* Guidelines for the management of atrial fibrillation: the Task Force for the Management of Atrial Fibrillation of the European Society of Cardiology (ESC). *Europace* 2010;**12**:1360–420.
2. January CT, Wann LS, Alpert JS, Calkins H, Cigarroa JE, Cleveland JC Jr *et al.* 2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: executive summary. *Circulation* 2014;**130**:2071–104.
3. Heidbuchel H, Verhamme P, Alings M, Antz M, Hacke W, Oldgren J *et al.* European Heart Rhythm Association Practical Guide on the use of new oral anticoagulants in patients with non-valvular atrial fibrillation: executive summary. *Europace* 2013;**15**:625–51.
4. Calkins H, Kuck KH, Cappato R, Brugada J, Camm AJ, Chen SA *et al.* 2012 HRS/EHRA/ECAS expert consensus statement on catheter and surgical ablation of atrial fibrillation: recommendations for patient selection, procedural techniques, patient management and follow-up, definitions, endpoints, and research trial design. *Europace* 2012;**14**:528–606.
5. Epstein AE, DiMarco JP, Ellenbogen KA, Estes NA 3rd, Freedman RA, Gettes LS *et al.* ACC/AHA/HRS 2008 guidelines for device-based therapy of cardiac rhythm abnormalities. *Circulation* 2008;**117**:e350–408.
6. Natale A, Raviele A, Al-Ahmad A, Alfieri O, Aliot E, Almendral J *et al.* Venice Chart International Consensus document on ventricular tachycardia/ventricular fibrillation ablation. *J Cardiovasc Electrophysiol* 2010;**21**:339–79.
7. Pedersen CT, Kay GN, Kalman J, Borggrefe M, Della-Bella P, Dickfeld T *et al.* EHRA/HRS/APHRS expert consensus on ventricular arrhythmias. *Europace* 2014;**16**:1257–83.
8. Sardar P, Chatterjee S, Chaudhari S, Lip GY. New oral anticoagulants in elderly adults: evidence from a meta-analysis of randomized trials. *J Am Geriatr Soc* 2014;**62**:857–64.
9. Chen J, Todd DM, Hocini M, Larsen TB, Bongiorni MG, Blomström-Lundqvist C. Current periprocedural management of ablation for atrial fibrillation in Europe: results of the European Heart Rhythm Association survey. *Europace* 2014;**16**:378–81.
10. Steinberg BA, Broderick SH, Lopes RD, Shaw LK, Thomas KL, DeWald TA *et al.* Use of antiarrhythmic drug therapy and clinical outcomes in older patients with concomitant atrial fibrillation and coronary artery disease. *Europace* 2014;**16**:1284–90.
11. Camm AJ, Lip GY, De Caterina R, Savelieva I, Atar D, Hohnloser SH *et al.* 2012 focused update of the ESC Guidelines for the management of atrial fibrillation: an update of the 2010 ESC Guidelines for the management of atrial fibrillation. Developed with the special contribution of the European Heart Rhythm Association. *Europace* 2012;**14**:1385–413.
12. Ohlmeier C, Mikolajczyk R, Haverkamp W, Garbe E. Incidence, prevalence, and antithrombotic management of atrial fibrillation in elderly Germans. *Europace* 2013;**15**:1436–44.
13. Sjalander S, Sjalander A, Svensson PJ, Friberg L. Atrial fibrillation patients do not benefit from acetylsalicylic acid. *Europace* 2014;**16**:631–8.
14. Chiang CE, Goethals M, O'Neill JO, Naditch-Brulé L, Brette S, Gamra H *et al.* Inappropriate use of antiarrhythmic drugs in paroxysmal and persistent atrial fibrillation in a large contemporary international survey: insights from RealiseAF. *Europace* 2013;**15**:1733–40.
15. Karasoy D, Gislason GH, Hansen J, Olesen JB, Torp-Pedersen C, Johannessen A *et al.* Temporal changes in patient characteristics and prior pharmacotherapy in patients undergoing radiofrequency ablation of atrial fibrillation: a Danish nationwide cohort study. *Europace* 2013;**15**:669–75.
16. Peichl P, Wichterle D, Pavlu L, Cihak R, Aldhoon B, Kautzner J. Complications of catheter ablation of ventricular tachycardia: a single-center experience. *Circ Arrhythm Electrophysiol* 2014;**7**:684–90.
17. Gupta A, Perera T, Ganesan A, Sullivan T, Lau DH, Roberts-Thomson KC *et al.* Complications of catheter ablation of atrial fibrillation: a systematic review. *Circ Arrhythm Electrophysiol* 2013;**6**:1082–8.
18. Santangeli P, Di Biase L, Mohanty P, Burkhardt JD, Horton R, Bai R *et al.* Catheter ablation of atrial fibrillation in octogenarians: safety and outcomes. *J Cardiovasc Electrophysiol* 2012;**23**:687–93.
19. Brignole M, Auricchio A, Baron-Esquivias G, Bordachar P, Boriani G, Breithardt OA *et al.* 2013 ESC guidelines on cardiac pacing and cardiac resynchronization therapy: the task force on cardiac pacing and resynchronization therapy of the European Society of Cardiology (ESC). Developed in collaboration with the European Heart Rhythm Association (EHRA). *Europace* 2013;**15**:1070–118.