SHORT REPORT

Cardioversion for atrial fibrillation: the views of consultant physicians, geriatricians and cardiologists

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Abstract

Background and aims: atrial fibrillation (AF) increases the risk of stroke and also has adverse haemodynamic consequences. Cardioversion of AF to sinus rhythm may obviate the need for long-term anticoagulation and improve cardiovascular haemodynamics, but is probably underused. We therefore investigated the views of hospital consultants about cardioversion for AF.

Methods: 336 postal questionnaires were sent to all 186 consultant physicians, 54 cardiologists and 96 geriatricians in Scotland, followed by one reminder letter to non-responders.

Results: 71% of questionnaires were returned. Cardiologists referred 18% of AF patients for cardioversion, while physicians referred 11% and geriatricians 5%. Cardiologists had better access to cardioversion facilities and were less likely to consider an enlarged left atrium and organic heart disease to be contra-indications to cardioversion. Anticoagulation was given for less than 3 weeks before cardioversion by 9% of cardiologists, 39% of physicians and 65% of geriatricians (P<0.001), and for less than 3 weeks after cardioversion by 17% of cardiologists, 45% of physicians and 47% of geriatricians (P=0.7).

Summary: the wide variation in practice both between and within the different specialties suggests that consensus guidelines based on the best available evidence should be developed.

Keywords: atrial fibrillation, cardioversion, physician preferences

Introduction

Atrial fibrillation (AF) increases the annual risk of stroke by about five times, and causes a 10% fall in cardiac output due to the loss of the atrial component of ventricular filling, which increases the risk of cardiac failure [1, 2]. Management of AF usually includes anticoagulation or aspirin to reduce the risk of stroke, and digoxin for patients with a fast ventricular rate. However, anticoagulation carries a risk of haemorrhage, and does not improve cardiovascular haemodynamics. By contrast, cardioversion of AF to sinus rhythm may obviate the need for long-term anticoagulation and improve cardiovascular haemodynamics, but is probably underused [3]. Our aim was to investigate the views of hospital consultants about cardioversion for AF, and to elucidate reasons for its apparent underuse.

Methods

Respondents were first asked how many patients with AF they see each year, and how many they referred for cardioversion. They were then asked whether direct current and chemical cardioversion would require referral to another unit or hospital, and whether, for more than half of their patients, they would use direct current or chemical cardioversion.
The next section contained questions about possible contra-indications to cardioversion, and respondents were asked to grade their answers as ‘always’, ‘usually’, ‘sometimes’ ‘occasionally’, ‘never’ or ‘irrelevant’. We then enquired about the use anti-arrhythmic agents after a first or second successful cardioversion, with answers graded from ‘always’ to ‘never’. Respondents were also asked to list drugs they would use for chemical cardioversion. Finally, we enquired about anticoagulation before and after cardioversion, with respondents grading their answers as no anticoagulation, anticoagulation for <3 weeks, 3–4 weeks, 4–5 weeks, 5–6 weeks or >6 weeks.

Results

Two hundred and thirty-eight questionnaires (71%) were returned, of which 30 were received following a reminder letter. Of these, 225 were completed and were analysed. Forty-seven (87%) cardiologists, 120 (65%) physicians and 58 (60%) geriatricians responded ($x^2 = 12.9, P = 0.01$). The main results are shown in Tables 1 and 2.

The following echocardiographic features were felt to be ‘always or usually’ a contra-indication to cardioversion: enlarged left atrium (27% of cardiologists, 46% of general physicians and 58% of geriatricians; $P = 0.04$), organic heart disease (2% of cardiologists, 15% of general physicians, 21% of geriatricians; $P = 0.02$) and severely impaired left ventricular function (54% of cardiologists, 51% of general physicians and 46% of geriatricians; $P = 0.6$). The duration of AF was felt to be irrelevant by 53% of cardiologists, 22% of general physicians and 27% of geriatricians ($P = 0.34$).

Direct current cardioversion would be used for over half of patients by 33 (70%) of 47 cardiologists, 58 (53%) of 109 general physicians and 24 (46%) of 52 geriatricians ($x^2 = 5.51; P = 0.07$). Of the 178 consultants who answered the question about drugs used for cardioversion, 57% would use amiodarone, 33% flecainide, 24% sotalol and 15% digoxin. No cardiologists used digoxin, while 13 (15%) of 87 physicians and 15 (32%) of 47 geriatricians did ($x^2 = 17.6, P < 0.001$).

Discussion

We found wide variation in all aspects of practice both between and within the different groups of specialists. Lip et al. also found wide variation in a postal survey of 500 consultant physicians and cardiologists, but their response rate was only 41% [4]. Our survey included consultant geriatricians and our response rate was 71%.

The overall cardioversion rates appeared low.

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**Table 1. Referral of patients for cardioversion, and access to cardioversion facilities**

<table>
<thead>
<tr>
<th>Reply, by group</th>
<th>Cardiologists</th>
<th>General physicians</th>
<th>Geriatricians</th>
<th>$x^2$</th>
<th>$P$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean % of atrial fibrillation patients referred for cardioversion</td>
<td>18%</td>
<td>11%</td>
<td>5%</td>
<td>116.3</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Direct current cardioversion requires referral to another unit or hospital</td>
<td>0 (0%)</td>
<td>21/114 (18%)</td>
<td>29/57 (51%)</td>
<td>59.6</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Chemical cardioversion requires referral to another unit or hospital</td>
<td>0 (0%)</td>
<td>4/115 (3%)</td>
<td>4/56 (7%)</td>
<td>5.0</td>
<td>0.22</td>
</tr>
</tbody>
</table>

*aThe denominators are not necessarily equivalent to the number of questionnaires returned because each respondent did not answer all the questions.*

**Table 2. Use of anti-arrhythmic agents and anticoagulants**

<table>
<thead>
<tr>
<th>Reply, by group</th>
<th>Cardiologists</th>
<th>General physicians</th>
<th>Geriatricians</th>
<th>$x^2$</th>
<th>$P$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always or usually use prophylactic antiarrhythmic agents after the first successful cardioversion</td>
<td>12/46 (26%)</td>
<td>46/107 (43%)</td>
<td>27/49 (55%)</td>
<td>16.8</td>
<td>0.05</td>
</tr>
<tr>
<td>Always or usually use prophylactic antiarrhythmic agents after the second successful cardioversion</td>
<td>38/45 (84%)</td>
<td>87/105 (83%)</td>
<td>36/44 (82%)</td>
<td>6.0</td>
<td>0.65</td>
</tr>
<tr>
<td>Anticoagulation for &lt;3 weeks prior to cardioversion</td>
<td>4/44 (9%)</td>
<td>39/99 (39%)</td>
<td>24/47 (51%)</td>
<td>58.1</td>
<td>0.001</td>
</tr>
<tr>
<td>Anticoagulation for &lt;3 weeks after cardioversion</td>
<td>7/42 (17%)</td>
<td>40/89 (45%)</td>
<td>21/45 (47%)</td>
<td>18.9</td>
<td>0.17</td>
</tr>
</tbody>
</table>

*aThe denominators are not necessarily equivalent to the number of questionnaires returned because each respondent did not answer all the questions.*

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Cardiologists reported a higher rate than physicians or geriatricians, which may reflect better access to facilities for direct-current cardioversion, or differences in case mix. Cardiologists were less concerned about structural contra-indications than the other specialists. Duration of AF, valvular heart disease, enlarged left atrium and poor left ventricular function predicted lower success rate of cardioversion in some studies [5–9], but a recent study of more than 1000 patients demonstrated that only left atrial size and New York Heart Association functional class were important [10]. Cardiologists used direct current cardioversion more frequently than the other specialists, which may reflect better access to appropriate facilities. Several different drugs were used for chemical cardioversion, but some physicians and geriatricians used digoxin, which is ineffective.

AF recurs in 60–75% of patients within 1 year, usually in the first month [11]. Cardiologists were less likely to use anti-arrhythmic drugs after a first successful cardioversion than the other specialists, but most specialists used anti-arrhythmics after a second cardioversion.

Patients should be anticoagulated before and after cardioversion, but the optimal duration of anticoagulation is uncertain [12, 13]. The American College of Chest Physicians recommend anticoagulation for 3 weeks before and 4 weeks after cardioversion [13, 14]. We found wide variation in anticoagulation prescription, which probably reflects uncertainty about the best practice.

The wide variation in all aspects of practice suggests that consensus guidelines based on the best available evidence should be now developed.

**Key points**

- Cardioversion is probably underused in atrial fibrillation.
- There was wide variation in practice both between and within different specialty groups.
- Consensus guidelines based on the best available evidence should now be developed.

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**References**


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Art class in a London day centre. © Sam Tanner.