Age-dependent detection of Atrial Fibrillation with implantable cardiac monitors in patients with cryptogenic stroke

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Background: Prolonged and intensified rhythm monitoring is recommended to detect atrial fibrillation (AF) in patients with cryptogenic stroke (CS). Continuous monitoring using implantable cardiac monitors (ICM) results in AF detection rates of up to 30%. Although higher age has been identified as an independent risk factor for AF in patients post CS, there are no specific recommendations for the implantation of ICM in younger patients.

Furthermore, the temporal relationship between AF and recurrent stroke in patients with continuous monitoring is a relevant issue and scarcely investigated.

Objectives:
(1) To analyze age-related AF rates in patients with CS and continuous rhythm monitoring using ICM.
(2) To determine the rates of oral anticoagulation and recurrent strokes in patients with ICM-detected AF after CS.
(3) To describe the temporal relationship of AF detection and recurrent stroke in these patients.

Methods: From 02/2014 to 11/2021, patients with CS provided with ICMs were systematically followed. All patients underwent 72-h ECG monitoring, transcranial doppler ultrasound and transthoracic echocardiography according to current guidelines prior to ICM insertion. Follow-up was performed by means of a regular outpatient presentation every three months and included medical history, physical examination, and interrogation of the ICM. AF was defined as any episode of absolute arrhythmia >30 seconds.

Results: One hundred and eighty-six patients (mean age 65 ± 12 years) were included in this analysis. AF was detected in 62 patients (33 %) during a mean follow-up of 36 ± 23 months. AF was found in 6 % (3/52), 27 % (17/62), 56 % (31/55) and 65 % (11/17) (p < 0.001) in patients aged <60 years, 60-69 years, 70-79 years and ≥80 years, respectively (see Figure 1). All patients with AF under 60 years had an impaired systolic left ventricular function (left ventricular ejection fraction <50 %). Oral anticoagulation was initiated in 85% of the patients with AF. Recurrent stroke occurred in 34 patients (18.3%) of whom fifteen had a diagnosis of AF. In nine patients, AF was diagnosed before the occurrence of a recurrent stroke. In four patients, AF was diagnosed after recurrent stroke and in one patient, AF and recurrent stroke occurred simultaneously (see Figure 2).

Conclusion: AF was absent in cryptogenic stroke patients with preserved ejection fraction and younger than 60 years. AF prevalence increased with age. The temporal relationship of AF and recurrent stroke was weak. Further research is needed to better identify stroke patients at risk of AF and recurrent stroke.

Figure 1: Time to first detection of Atrial fibrillation in patients aged < 60 years, 60-69 years, 70-79 years and ≥80 years, respectively.

Figure 2: Temporal relationship of first detected atrial fibrillation (AF) and recurrent stroke in patients with cryptogenic stroke.
Figure 1

Atrial Fibrillation detected (% of patients)

Age
- < 60 years
- 60-69 years
- 70-79 years
- ≥ 80 years
- P < 0.001

No. patients at risk

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<th>18</th>
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<th>36</th>
<th>42</th>
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<td>5</td>
<td>4</td>
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<td>3</td>
<td>3</td>
<td>2</td>
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<tr>
<td>70-79 years</td>
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<td>25</td>
<td>21</td>
<td>16</td>
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<td>11</td>
<td>8</td>
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<tr>
<td>60-69 years</td>
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<td>44</td>
<td>40</td>
<td>34</td>
<td>31</td>
<td>30</td>
<td>26</td>
<td>18</td>
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</tbody>
</table>

Time [months]

Figure 2

Patients

- Recurrent Stroke
- Atrial Fibrillation
- Coincidence of detection of AF and recurrent stroke
- Stroke recurrence before AF detection
- AF detection before stroke recurrence
- No sufficient anticoagulation

* No sufficient anticoagulation

months