Palpitations, diagnostic work-up, pacemaker therapy

Dr. T.A. Simmers
“How do device-detected (asymptomatic) arrhythmias translate into therapeutic strategy?”
Agenda

• When to monitor invasively?
• How common is asymptomatic AF in patients with an implantable device?
  – Without prior TE event
  – With a prior TE event
• What are the consequences in regard to anticoagulation in each case? (prediction vs prevention)
Patients with suspected but undiagnosed atrial fibrillation

Recent monitoring strategies. More intense and prolonged monitoring is justified in highly symptomatic patients [European Heart Rhythm Association IV (EHRA IV)—see Section 3.6], patients with recurrent syncope, and patients with a potential indication for anticoagulation (especially after cryptogenic stroke). In selected patients, implantation of a leadless AF monitoring device may be considered to establish the diagnosis.

Source: 2010 ESC AF management guideline
Asymptomatic AF in the CIED pt

- Subgroup from MOST trial (DDD vs VVI pacing)
- n=312 patients with AHRE, from total 2010 in study (15.5%)
- AHRE >220 bpm > 5min
- With and without history of AF
- FU 6 yrs

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<thead>
<tr>
<th></th>
<th>HR for AHRE +</th>
<th>p</th>
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<tbody>
<tr>
<td>All mortality</td>
<td>2.48</td>
<td>0.0092</td>
</tr>
<tr>
<td>Death/nonfatal stoke</td>
<td>2.79</td>
<td>0.0011</td>
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<tr>
<td>AF</td>
<td>5.93</td>
<td>0.0001</td>
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Asymptomatic AF in the CIED pt

- TRENDS trial
- n=2486 pts, ≥ 1 risk factor for stroke
- With and without history of AF
- ICD or PM implant
- AT/AF burden as longest duration episode last 30 days
- FU 1.4 yrs

<table>
<thead>
<tr>
<th>AT/AF burden</th>
<th>TE risk/yr (%)</th>
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<tbody>
<tr>
<td>Zero</td>
<td>1.1</td>
</tr>
<tr>
<td>Low (&lt; 5.5 hrs)</td>
<td>1.1</td>
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<tr>
<td>High (≥ 5.5 hrs)</td>
<td>2.4</td>
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Asymptomatic AF in the CIED pt, no prior history of stroke

- ASSERT trial
- n=2580, >65 yrs
- No history of AF
- Recent PM / ICD
- 3 mo monitoring for subclinical atrial arrhythmias
  - Atrial rate >190 bpm
  - For > 6 min
- 2.5 yrs FU, primary endpoint ischemic stroke / SE

Healy. NEJM 2012;366:120-9
ASSERT, results

HR 5.56, P<0.001

No. at Risk
| Subclinical atrial tachyarrhythmias present | 261 | 236 | 222 | 205 | 160 | 110 |
| Subclinical atrial tachyarrhythmias absent | 2319 | 2146 | 2064 | 1911 | 1544 | 1176 |
ASSERT, results

<table>
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<th>No. at Risk</th>
<th>Years of Follow-up</th>
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<tr>
<td>Subclinical atrial tachyarrhythmias present</td>
<td>0.00</td>
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<tr>
<td>Subclinical atrial tachyarrhythmias absent</td>
<td>0.00</td>
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<tr>
<td>261</td>
<td>249</td>
</tr>
<tr>
<td>2319</td>
<td>2145</td>
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</table>

HR 2.5, P=0.008
Copenhagen Holter Study

- 678 healthy subjects, 55-75 yrs
- No history of AF, stroke, CV disease
- 48hr Holter
- Excessive supraventricular ectopy (ESVA)
  - ≥ 30 PAC/hr
  - Any run ≥ 20 beats
- FU mean 6.3 yrs
- Primary endpoint death or stroke

Binici. Circulation 2010;121:1904-11
Copenhagen Holter Study, results

- 14.6% had ESVA
- HR for CVA / death: 1.64 (p=0.036)
- HR for stroke: 2.79 (p=0.014)
- HR for admission with AF: 2.78 (p=0.033)
Asymptomatic AF in the CIED pt, with a prior history of stroke

- TRENDS prior stroke subgroup analysis
- 319 patients with TE event
- Excluded: 80 with history of AF, 56 on warfarin, 20 on AAD
- Leaving 163 patients for analysis
- Newly detected AT/AF in 28% over 1.1 yrs FU

Ziegler. Stroke 2010;41
Asymptomatic AF in the pt with a prior history of stroke

- 56 pts, cryptogenic stroke
- Mobile outpatient telemetry 5-21 days
- 23% newly diagnosed AF at a median 7 days
- 85% < 30sec duration

Tayal. Neurology 2008;71:1696-1701
Diagnosis of AF *after* stroke

- Swedish stroke registry
- n=57636 pts with nonfatal stroke
- No prior AF diagnosis
- 2.2 yrs FU
- Incidence of hospitalisation for AF 2769pts (4.8%)
- Stratified per CHADS$_2$ score
Swedish Stroke Registry

Henriksson. *Clin cardiol* 2011;34:309-16

HR 4.2

[Graph showing the relationship between New AF after stroke and CHADS2 score over time, with a hazard ratio of 4.2.]
Work in progress

- CRYSTAL AF trial
- Randomized prospective multicentre study in 450 pts with cryptogenic stroke
- 1:1 standard monitoring: Reveal XT
- Primary endpoint time to detection of AF within 6 mo after stroke
- FU at least 12 months
- Study completion expected late 2012

*Sinha. Am Heart J 2010;160:36-41*
Summary

- Even very brief, sub-clinical episodes of AF are associated with increased stroke risk
- They are markers for occurrence of clinical AF
- Extended monitoring post cryptogenic stroke is warranted, especially in high risk populations
- Screening in (elderly) high risk population *without* prior TE event?
- More aggressive anticoagulation strategies may be warranted in these pt populations
Case

- 39 year-old male
- Structurally normal heart and resting EKG
- Highly symptomatic, documented PAF since early adulthood
- Referred for PVI due to symptoms + drug side-effects
AVNRT CL 360ms
Other SVT’s / non-PV foci as triggers for AF

- n=409 pts referred for PVI
- 55±9 yrs
- All underwent EP study and ablation aimed at any other arrhythmia
- 7.6% inducible SVT
  - Flutter 3.7%
  - AVNRT 1.7%
  - AVRT 1.2%
  - AT 1.0%
- AF recurrence rate significantly higher in flutter than all other (53%, p=0.03)

Other SVT’s / non-PV foci as triggers for AF

- 257 pts referred for PVI
- 10.1% inducible SVT, ablated
  - 4.7% AVNRT
  - 3.5% AVRT
  - 1.9% AT
- Younger than rest of cohort (43 vs. 57 yrs)
- 7.7% AF recurrence rate

Sciarr. Europace 2010;12:1707-12
AF / WPW

- 116 pts with PAF, referred for ablation of an AP
- AF recurrence 12% < 50 yrs, 35% > 50, 55% > 60
- Vs 4% in control group of 100 pts without prior AF

AF / AVNRT

- 629 referrals for PVI
- AVNRT inducible in 4.3%
- Younger at onset of symptoms than rest of cohort (37 vs. 48 yrs)
- Ablation: 14/27 pts PVI and SP, 13/27 SP only
- FU 21.4 mo
- 12/13 pts AF-free off drugs after only SP ablation

Conclusions

- Asymptomatic AF is highly prevalent in CIED pts
- It predicts TE events
- This should have a profound effect on management of (preventive) anticoagulation therapy
- In addition to utilisation of ILRs in high risk patients
- In patients referred for PVI, the arrhythmia you see is not always what you get
- This should also be reflected in diagnostic and therapeutic approach to the PVI candidate