Detection & Diagnosis of Atrial Fibrillation in Primary Care

Dr Eric CAJEAT
Springfield Primary Care Centre
NHS Lambeth CVD Lead
Most common cardiac arrhythmia

Major risk factor of stroke:
- Annual incidence 5-6 times greater in patients with AF
- Responsible for about 45% of all embolic strokes
- Ischaemic strokes associated with AF often fatal

Terrible consequences of AF-related stroke:
- From a “silent” condition to a disabling condition
- High morbidity /mortality (X2/other causes of stroke)
- Higher risk of recurrence than for other causes of stroke
- Cost of care X1.5
Stroke risk is preventable:

- Warfarin reduces risk of stroke:
  - 68% in primary prevention
  - 62% in secondary prevention

- Under-used:
  - 53% of males / 40% of females with AF were receiving oral anticoagulants (in 2003)
  - 20% to 40% people with AF who are eligible are not receiving anticoagulation!

- NNT prevent 1 stroke 37
- 4,500 strokes/year
- 3,000 deaths/year through improved services / optimal therapy could be prevented


But... AF is often asymptomatic
- 69% in euro heart survey
- .... unless, screened or diagnosed at time of complication / hospital admission.

Prevalence: an aged-related condition:
- 1 to 2 % of total UK population
- 5% over 65 year-old
- 10% over 80 year-old
- True prevalence certainly much higher, >2% of total population
- plus with an ageing population: new “epidemic”

Nieuwlaat, R., Capuci, A et al. (2005), Atrial fibrillation management: a prospective survey in ESC members countries, European Heart Journal, 26, pp. 2422-2434.
The prevalence problem....

- DeWilde et al.:
  - Trend 1993 > 2003 of diagnosed AF
  - Data from 131 general practices (about 1 million reg. pats. annually)
  - Estimated 2003 prevalence of active/ever diagnosed AF:
    - 1.31% and 1.49% respectively in men,
    - 1.15% and 1.29% respectively in women
    - aged >85 years:13.2% in men and 11% in women.

- 2007/2008 QOF data national prevalence of diagnosed AF is 1.30%

are we doing well?

2006/07 QOF data – raw (unadjusted) figures.

<table>
<thead>
<tr>
<th>PCT</th>
<th>Prevalence</th>
<th>Low CI</th>
<th>High CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>London</td>
<td>0.8</td>
<td>0.79</td>
<td>0.8</td>
</tr>
<tr>
<td>Bromley</td>
<td>1.36</td>
<td>1.32</td>
<td>1.4</td>
</tr>
<tr>
<td>Greenwich</td>
<td>0.8</td>
<td>0.76</td>
<td>0.83</td>
</tr>
<tr>
<td>Lambeth</td>
<td>0.53</td>
<td>0.51</td>
<td>0.56</td>
</tr>
<tr>
<td>Lewisham</td>
<td>0.56</td>
<td>0.54</td>
<td>0.59</td>
</tr>
<tr>
<td>Southwark</td>
<td>0.56</td>
<td>0.54</td>
<td>0.59</td>
</tr>
</tbody>
</table>

NHS information centre, Clinical and Health Outcomes Knowledge Base, available at:
www.nchod.nhs.uk/NCHOD/Compendium.nsf/2217490fcc66bd94802573a30020fcd6/49b9f8b9217bbc90802576870040faed!OpenDocument
Lambeth Data Combined Model (Oct 08-Sept 09)

- Based on registered population / QOF AF registers

- **Unadjusted prevalence:**
  - Total prevalence: 0.56%
  - 66-75 year-old: 3.37%
  - Over 76 year-old: 8.92%

- Large variations between practices:
  - Total prevalence: 0.15 to 1.25%
  - 66-75 year-old: 0 to 9.3%
  - Over 76 year-old: 3.75 to 20.58%
Detection of AF?

1- Symptoms:

- Breathlessness / dyspnoea:
  - De novo
  - **Deterioration with pre-existing condition**: e.g. HF, COPD.... (loss of Atrial “kick”)
- Palpitations
- Chest discomfort
- Syncope / dizziness
- Stroke / TIA
- Heart Failure

2- Screening:

- Opportunistic
- Systematic
Screening: some evidences...

- **Opportunistic Pulse check in Durham**:  
  - 1,883 patients over 65 (practice population of 11,423)  
  - 1,569 pulses checked, 207 irregular pulses out of which 130 patients no known AF  
  - 99 had an ECG  
  - 39 newly diagnosed cases of AF (detection rate of 2.48%)  
  - Prevalence:  
    - from 1.32% to 1.82%  
    - In over 65 > 10.9%
Opportunistic screening in North-East Essex:

- 37 practices signed-up LES
- 43,210 patients screened in 6 weeks at flu clinics

Outcomes:
- 3,154 patients with irregular pulse (9.2%);
- 189 patients AF (0.55%);
- 342 patients other arrhythmias
- 77 patients CHADS2 stratified as being at risk for stroke and started on Warfarin

Cost:
- Overall cost: £68,402
- Screening costs: £2 per patient
- Cost per diagnosis: £362

Savings:
- 5 strokes prevented during the next year at £44,000 each (based on a 5% incidence of stroke in patients with AF and 50% reduction with Warfarin)
- Annual cost saving (recurrent): £220,000
- Return on investment: 322%

---

- **Best opportunistic screening opportunities:**
  - Flu clinic
  - Medication review
  - **Elderly population**
  - Chronic illness monitoring: **important co-morbidity**
    - Diabetes: 20% of AF have diabetes!
    - Hypertension
    - IHD
    - HF: up to 30-40% of patients with HF
    - Valvular Heart Disease (LA distension, early in MR/MS but late in Ao disease)
    - COPD
    - CKD
  - Other associated co-morbidities:
    - Thyroid dysfunction
    - Sleep apnoea
✓ AND new NHS health check programme!

- Every 5 years
- All patients aged between 40 and 74 years
- Exclude patients with known hypertension, ischemic heart disease, stroke, diabetes and chronic kidney disease
- Universal risk assessment and management programme
Pulse palpation....

- Quick, simple and reliable
- High sensitivity, 95% (unlikely to miss an individual with AF)
- Moderate specificity, 75% (could misclassify an individual who does not have AF as having AF)
- Low Positive Predictive Value, 8-23%

- Taking pulse for a period of 20 seconds increases specificity (98%) but reduces sensitivity (50%)


The tricky ECG!

- Irregular pulse should ALWAYS raise the possibility of AF but ECG is essential to establish the diagnostic

- But highly dependant on interpretation!

- Mant et Al. (2007)\(^1\)
  - SAFE study, 49 practices, 2595 patients/ECGs, compared 49 GPs – 49 nurses – ECG interpretative software, consultants cardiologist as gold standard,

GPs:
- detected 79/99 cases of AF (sensitivity 80%, 95% CI 71-87%)
- misinterpreted 114/1355 cases of SR (specificity 92%, 95% CI 90-93%)
- Low PPV: 40.9%, so more likely to be wrong...

PNs:
- Similar sensitivity 77% (CI 67-85%)
- Lower specificity (85%, CI 83-87%)

Software:
- Similar sensitivity 83% > so still missed cases!!!
  - No rhythm diagnosis in 4.3% (109)
  - Missed 12% (26) of AF or 17% (36) if inclusion of no rhythm
- Higher specificity 99% > more accurate.

GPs + Software: 92% sensitivity & 91% specificity

Conclusion: “many PCP cannot accurately detect AF on an ECG and interpretative software is not sufficient to circumvent this problem”
AF criteria:

- Irregularly irregular rhythm

- P wave:
  - **No distinct P waves, wavy baseline**
  - Sometime or in some leads: “fine” or “f” waves <1mm, “coarse” or “F” waves > 1mm
  - If seen atrial rate >350ppm

- PR interval: not measurable

- QRS:
  - **irregularly irregular RR interval** (refractory period of AV node)
  - Normal shape unless intra-ventricular conduction problem or added ectopics
  - Variable ventricular response:
    - Slow <60
    - Fast 100

ECG differential diagnosis...

- Mainly supraventricular arrhythmias
  - Atrial tachycardia
  - Atrial flutter
  - Atrial ectopics: e.g. Multifocal Atrial Tachycardia:

In doubt contact our local cardiologists!
Next steps....

1- Look for evidence of:
   ✓ Symptoms of IHD
   ✓ Duration and pattern of AF: ?paroxysmal
   ✓ HF
   ✓ Structural HD: e.g. heart murmur
   ✓ Thyroid disease
   ✓ Other risk factors for stroke: hypertension, diabetes, smoking status

2- Blood tests:
   ✓ U&E
   ✓ FBC
   ✓ TFT
   ✓ LFTs
   ✓ Fasting lipids and glucose
   ✓ INR
3- Further investigations

- Chest x-ray: if suspicion of abnormality based on clinical history and examination
- Transthoracique echocardiography:
  - When important for long-term management e.g. younger patients
  - High risk or suspicion of underlying structural heart disease
  - Refinement of clinical risk stratification for antithrombotic therapy is needed
  - Rhythm control strategy including cardioversion is considered


3- Initiate treatment: Risk stratify for risk of stroke

✓ Anticoagulation therapy:
  - Ideally on day one of diagnosis or as early as possible after diagnosis
  - **Estimate risk of stroke > e.g. CHAD2 score**
  - Estimate risk of bleeding

✓ Initiate rate control therapy:
  - BB first line
  - If CI, rate-limiting Ca+ antagonist
  - Especially if AF is not well tolerated

✓ ? Cardiology referral

Heart and Stroke Improvement

Atrial fibrillation in primary care: making an impact on stroke prevention

National priority project final summaries

October 2009

Conclusion:

- **TAKE YOUR PATIENTS’ PULSE OPPORTUNISTICALLY**
- Think **effective** stroke prevention & do a **CHAD2 score**

- 150,00 strokes per year in the UK
- 410 per day, 17 per hour, 10 within the next 4 hours...
- 8 would have been known to be at high risk of stroke
- 6 should have been on Warfarin
- 3 will go home, 5 will end up in residential care, 2 will die.....

[www.stroke.org.uk](http://www.stroke.org.uk)