Angina

Cardiology Update
5 October 2017

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Angina

• Why do we worry
• What are we trying to do
• What are the risks?
• NICE guidelines
• How to manage angina
• Risk stratification
Why treat angina?

• To prevent sequelae
  • Crescendo or new angina
  • Unstable symptoms
  • NSTEMI

• To find those at highest risk
  • Those with most severe lesions
  • Those with high risk coronary disease
  • Those with LMS or three vessel disease

• Symptomatic benefit – mostly
Let’s see some angiograms!

But first, some basics
Coronary artery plaque development
Severity of stenosis predicts future risk

Severity of stenosis predicts future risk

Majority of MIs are not associated with significant stenoses.
Effect of Coronary Artery Stenosis

Normalized Mean Coronary Flow (% basal)

Max Vasodilatation

At rest

Stylised from Gould et al Am J Cardiol 1974;33:87-94
Angina

• Typical symptoms
• Less typical symptoms
• Associated with exertion, emotion
• If pain occurs at rest, ask yourself, “is this really angina?”
What is not angina?

- Collapse
- Syncope or pre-syncope
- “Found on floor”, trop positive
- Pain without trigger (often)
- Constant pain over long period
- Tender chest wall
- Pain lifting or carrying
What is acute coronary syndrome?

• All encompassing term for unstable angina and NSTEMI
• Crescendo angina, pain at rest

• It is a widely misused term in A/E and the AMU
• Collapse with vague collection of aches, mild renal impairment and no acute ECG changes is not “?ACS – await cardiology opinion”!
ACS – should this term be banned?

• Yes!
• It’s too broad
• It’s over-used
• It doesn’t mean anything
• It’s a stalling tactic
• Think instead

Another Chap Stuck (in bed)

Ask Cardiology to Sort

Is this unstable angina?
• Is this an NSTEMI
Troponin

• Very sensitive marker of cardiac myocyte damage
• Troponin elevation associated with increased risk of acute MI
• If not detected, no damage
  • Definitive at 12 hours but reliably reassuring at 3 or 6 hours
• Negative troponin makes acute MI unlikely
  • BUT it is not a guarantee that MI will not follow
• The history is KEY
Troponin

• Take a positive troponin in context
• With chest pain or other anginal feature
• With ECG changes

• After fall/collapse
• With sepsis
• With PE
• With acute other insult with underlying IHD
Some scenarios

All are real cases admitted last week at Frimley Park Hospital
Case 1

• 65 year old female attending A/E
• Compressive and burning discomfort intermittently over last two weeks
• Worse with exertion
• Family history of premature coronary disease
• 12 hour troponin negative
• ECG
ECG
Management plan - options

• 1 – Discharge with OP functional test
• 2 – Discharge with OP angiogram
• 3 – In patient exercise test
• 4 – In patient angiogram

• This is crescendo angina
• For IP angiogram
Critical LAD stenosis
LAD stented
Medical v intervention for stable angina

- COURAGE study
- 2287 patients (from 35000 screened) randomised
- Optimal medical therapy with aggressive lifestyle and CAD risk factor modification v PCI and optimal medical therapy
- Predominantly pre-DES era
- Follow up for 5 years
COURAGE Results
No difference in the primary endpoints

A – Freedom from death and MI
B – Overall survival
C – Freedom from ACS
D – Freedom from MI

Lessons from COURAGE

• Reinforced existing knowledge
  • PCI does not change mortality in stable angina
  • Optimal therapy and lifestyle important

• It does not invalidate PCI
  • There was a reduction in revascularisation in the PCI arm
    • 21.1% v 32.6%
FAME 2 Study
Fractional Flow Reserve versus Angiography for Multivessel Evaluation 2

• Randomised study of patients with limiting angina
• Angiography followed by pressure wire assessment of potentially significant lesions
• FFR <0.80
• Randomised to PCI or OMT
• PCI with second generation DES
FAME 2 results

A – Death, MI, urgent revascularisation

B – All cause mortality

C – Myocardial infarction

D – Urgent revascularisation

Lessons from FAME 2

- PCI reduces need for urgent revascularisation
  - When lesion proven to be significant by FFR
  - Using DES
- It does not change rates of mortality or MI
Case 2

- 40 year old man self-presented at A/E
- Retrosternal discomfort.
- Pressure/burning
- Exertional
- No RFs
- ECG normal
- Troponin normal
Management plan - options

• 1 – Discharge with OP cardiology/RACPAC referral
• 2 – Discharge with OP functional test
• 3 – Discharge with OP angiogram
• 4 – In patient angiogram

• This is new onset angina
• For medical therapy and early OP functional test or angiogram
What happened?

• Given omeprazole 20mg bd
• No change in symptoms
• Returned to GP after increasing symptoms and prolonged pain for 6 hours
• Referred to A/E – GP suspicious re “exertional dyspepsia”
• ECG normal
• Troponin I - 600
Management plan - options

• 1 – Discharge with OP functional test
• 2 – Discharge with OP angiogram
• 3 – In patient exercise test
• 4 – In patient angiogram

• This is an NSTEMI
• For medical therapy and IP angiogram/PCI
Angiogram – occluded mid RCA
Severe LAD lesion with collateral filling of distal RCA
RCA stented
NICE guidelines for the drug treatment for stable angina

Offer either a beta blocker or calcium channel blocker as first-line treatment for stable angina

Beta blocker or calcium channel blocker not tolerated

Consider switching to the other option

Symptoms not satisfactorily controlled

Consider either switching to the other option or using a combination of the two

Symptoms not satisfactorily controlled on two anti-anginal drugs and the person is waiting for revascularisation or revascularisation is not considered appropriate

Consider adding a third anti-anginal drug

Do not:
• offer a third anti-anginal drug when stable angina is controlled with two
• routinely offer anti-anginal drugs other than beta blockers or calcium channel blockers as first-line treatment for stable angina.
Treatment options for angina

• Medical therapy
  • ASA
  • Beta-blockade; CCB if contra-indication
  • Ivabradine
  • Nitrate
  • Nicorandil
  • Ranolazine

• Revascularisation

• Risk factor modification
  • Smoking
  • Exercise
  • Weight loss
Revascularisation

• When symptoms despite medication
• Consider CABG or PCI.
• PCI may be the more cost effective procedure
• CABG over PCI for people with multivessel disease who:
  – have diabetes or
  – are over 65 years or
  – have anatomically complex three-vessel disease, with or without involvement of the left main stem.
Case 3

- 88 year old man being worked up for severe aortic stenosis
  - Gradient 70mmHg
  - Exertional SOB
  - Coronary angiogram showed severe lesion in the distal RCA – planned for medical management
- Referred to TAVI MDT
- Two weeks later, self presented with anginal CP at low workload
  - Climbing stairs, washing up
What’s the diagnosis?

• 1 – Progressive aortic stenosis
• 2 – Symptomatic coronary disease due to worsening of narrowing
• 3 – Anxiety triggered by newly diagnosed coronary disease

• It could be 2 or 3 but the history suggested highly likely to be ischaemia
Critical distal RCA lesion
RCA stented
ACS risk assessment

• Markers of risk
• Unstable or crescendo symptoms
• ECG changes, especially dynamic
  • ST depression
  • T inversion
• Troponin elevation
• Multiple risk factors
GRACE score

• Risk scoring system in ACS
• Derived from 100K patients admitted
• Online or app calculator
• gracescore.org
• Simple measures
• Age, HR, SBP, CHF, Cr, ST change, Troponin, cardiac arrest
www.gracescore.org
Case 1

- 65 year old female attending A/E
- Compressive and burning discomfort intermittently over last two weeks
- Worse with exertion
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- 12 hour troponin negative
- ECG
## 1. Input Data > 2. Death / Death MI Results

### Death

<table>
<thead>
<tr>
<th>Time</th>
<th>% Risk (Score)</th>
<th>Histograms</th>
</tr>
</thead>
<tbody>
<tr>
<td>In hospital</td>
<td>2.0</td>
<td>Not available</td>
</tr>
<tr>
<td>6 months</td>
<td>3.3–5.3 (107)</td>
<td>Not available</td>
</tr>
<tr>
<td>1 year</td>
<td>3.3–5.3</td>
<td>GRAPH</td>
</tr>
<tr>
<td>3 years</td>
<td>15</td>
<td>GRAPH</td>
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### Death/MI

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<tr>
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<td>7.0</td>
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**Number of patients by risk group for 1-year death or MI**

Area plot: distribution (log scale) of risk based on the entire GRACE population of 102,341 patients.

Line: risk of death or death/MI

Vertical bar: individual risk of death or death/MI

**green** = low, **yellow** = intermediate, **red** = high
Case 2

• 40 year old man self-presented at A/E
• Retrosternal discomfort.
• Pressure/burning
• Exertional
• No RFs
• ECG normal
• Troponin normal
### Calculator

**1. INPUT DATA > 2. DEATH / DEATH MI RESULTS**

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<tr>
<td>Time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In hospital</td>
<td>0.2</td>
<td>Not available</td>
</tr>
<tr>
<td>6 months</td>
<td>0.7 (44)</td>
<td>Not available</td>
</tr>
<tr>
<td>1 year</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>3 years</td>
<td>2.4</td>
<td></td>
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**Number of patients by risk group for 1-year death or MI**

- **3.2%**

![Distribution of risk in GRACE population](graph)

- **Area plot**: distribution (log scale) of risk based on the entire GRACE population of 102,341 patients.
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1. INPUT DATA > 2. DEATH / DEATH MI RESULTS

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<tr>
<td>6 months</td>
<td>12 (135)</td>
<td>Not available</td>
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<tr>
<td>1 year</td>
<td>13</td>
<td>GRAPH</td>
</tr>
<tr>
<td>3 years</td>
<td>60</td>
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### Death/MI

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Using GRACE score

- It helps to risk stratify
- Some high risk cases are missed
  - Be mindful of the history
- It is quick and easy
Conclusions

• Chest pain in the admission unit is a huge burden
• ACS is an unhelpful label
• History remains paramount
• Not all pain needs admission
• Not all admissions require in patient investigation
• Risk stratification tools may help
• Medical therapy is valuable
• PCI reduces symptoms for stable angina
• PCI reduces mortality in NSTEMI and STEMI
Questions?