Unanswered Qs in STEMI management – Q3

What about ‘aborted infarction’?

- Is there consensus on the definition?
- Aborted infarction and TIME to treatment
- Aborted MI as an outcome measure?
- Conclusions

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“Aborted myocardial infarction”

Term first used by Weaver et al, JAMA, 1993

PHT trial MITI

“40% of all patients treated within 3 hours had no myocardial defect detectable…it appears that if patients can be identified and treated early after symptom onset the infarction process can be essentially aborted”
Pathophysiology:

“Abortion of myocardial infarction is thought to follow rapid early reperfusion of a thrombotic occlusion of an epicardial coronary artery such that myocardial necrosis cannot be detected by classical plasma enzyme analyses.”

Verheugt et al, Eur Heart J, 2006
Lamfers et al, Heart, 2003

Retrospective study evaluating aborted AMI in patients receiving PHT vs in-hospital thrombolysis

475 patients PHT vs 269 IHT

Definition of aborted AMI:
Combination of subsiding ST elevation to <50% of the level at presentation, together with a CK of less than twice the upper limit of normal
Aborted AMI higher in the PHT population:

17.1% vs 4.5%

Time to treatment shorter in patients with aborted AMI

86 vs 123 minutes

Aborted AMI had a lower 12 month mortality than established AMI:

2.2% vs 11.6%

PHT associated with fourfold increase in aborted AMI c/f IHT
Taher et al, JACC, 2004; 44:38-43

Subset of patients from ASSENT-3

Definition of aborted AMI:
Maximal creatine kinase < 2x upper limit of normal coupled with typical evolutionary ECG changes

727 of 5470 (13.3%) had an aborted AMI

Highest frequency (25%) occurring in patients treated within 1 hour of onset of symptoms
Frequency of aborted AMI vs time to treatment

Taher et al, JACC, 2004; 44:38-43
Taher et al, JACC, 2004

Mortality significantly lower in patients with aborted AMI:
OR 0.70 (CI 0.5 – 0.98) at 1 year

Patients with aborted AMI more often had complete ST segment resolution at 60 minutes (56.35 vs 30.2%)

Very low-risk subset identified with greater than 70% ST resolution at 60 minutes with 1 year mortality of 2.7%
Outcomes of aborted MI according to extent of ST resolution

White bar = aborted MI with >70% ST resolution at 60 minutes
Grey bar = aborted MI with <70% ST resolution at 60 minutes

* p = 0.002
Masquerading MI / Unjustified Thrombolysis

Must distinguish between “Masquerading MI” (Taher) or “Unjustified Thrombolysis” (Lamfers) AND Aborted MI

Both have absence of cardiac enzyme rise in common, but in aborted AMI, this is due to timely reperfusion; in unjustified thrombolysis, it is due to error in diagnosis

Distinction based on evolutionary ECG changes

2% ASSENT-3 subset, Taher et al
1.5% PHT group, 1.9% IHT group, Lamfers et al
Masquerading MI / Unjustified Thrombolysis

Definitions:

Aborted MI
1. Subsiding ST deviation >50% within 2 hours after thrombolysis
2. Rise in cardiac enzymes <2 times upper limit of normal

Unjustified thrombolysis
1. No change in ST deviation within 48 hours of thrombolysis
2. Rise in cardiac enzymes <2 times upper limit of normal

Lamfers et al, Am Heart J, 2004
Causes of Masquerading MI

Acute pericarditis
Aortic dissection
Left ventricular aneurysm
Left ventricular hypertrophy
Early depolarisation
Left bundle branch block
Brugada syndrome
What about troponins?

Will the use of troponins change the definition of aborted MI?

Unknown!

Troponins are now fairly universal as the preferred cardiac marker

No studies yet evaluating aborted MI in terms of troponins
Conclusions

• Link between early thrombolysis and aborted infarcts

• No specific link between PHT and aborted infarcts

• We know that there is an association between PHT and earlier thrombolysis

• Subsequent link between PHT and aborted infarcts intuitive – need larger numbers
Aborted MI as an Outcome Measure?

“The number of aborted MI’s may be a better indicator of efficacy of early thrombolysis than currently used measures e.g. mortality”

Lamfers et al 2003
Vergheut et al 2006