Protocol 12

Nuclear Cardiology Royal Victoria Hospital

Adenosine for Myocardial Perfusion Imaging- Stress Protocol

Background

Adenosine is a direct coronary vasodilator via its action on A2a receptors. It has other pharmacological effects mediated via other adenosine receptor subtypes. These include systemic vasodilation, bradycardia though actions on the sinus and atrio-ventricular nodes, and bronchospasm via receptors in the lungs.

Requirements for stress

1. CP led pharmacology stress tests may only be undertaken by a Band 7/8 member of staff who has completed the requisite training.
2. A minimum of 2 members of staff must be present during pharmacological stress testing.
3. Appropriate resuscitation facilities, including for bronchospasm, must be in place.

Indications

Adenosine is indicated for vasodilator stress as part of myocardial perfusion imaging in adult patients on the basis of a weight adjusted infusion. Patients with renal or liver disease do not require any dose adjustment. It is mainly used in patients:

- Who are expected not to exercise adequately to 85% maximal predicted heart rate (for example due to physical factors or severe cardiac disease)
- Who have previously failed to exercise adequately to 85% maximal predicted heart rate
- With abnormal resting ECG such that interpretation during exercise is unhelpful, in particular ECG showing >1mm resting ST depression, LBBB, ventricular pacing, broad RBBB

Contra-indications

- Known previous allergy to adenosine
- Documented chest disease especially wheeze/asthma
- Recent (< 48 hours) Acute Coronary Syndrome
- Greater than 1st degree AV block (without pacemaker)
- Hypotension (systolic BP < 90 mmHg at rest)
- Aminophylline/theophylline prescription
- Incorrect patient preparation including continued use of dipyridamole

6. Connect patient to 12 lead ECG – record standard 12 lead and then modify lead positions for stress
7. Insert 2 peripheral canula – 1 in each arm with appropriate connecting tube for radio-nuclide tracer. (alternatively a 3 way tap may be used)
8. Prepare Baxter pump to deliver 140 microgram/kg/min of 1mg/ml Adenosine (pre-prepared bags) OR GH Alaris Plus Carefusion syringe driver to deliver 140 microgram/kg/min of 3mg/ml Adenoscan (drawn up in a syringe from 10 ml vials) for a total dose to cover 6 minutes and giving-set dead space (see appendix for volume and dose)
9. A second independent check of dose and infusion pump settings should be undertaken
10. Perform pre-test ECGs and BPs (supine, standing and hyperventilation)
11. Bring patient to treadmill where appropriate
12. Connect adenosine infusion
13. Exercise patient on treadmill at appropriate level for 6 minutes injecting radio-isotope at 3-4 minutes of exercise and continuing to end of protocol
14. Observe and continuously monitor throughout the test with minimum recordings of ECG and BP every 3 mins.
15. Monitor recovery period until pre-test conditions have been reached

Indications for early termination of Adenosine infusion

- Symptomatic hypotension
- High grade AV Block
- Bronchospasm (if severe bronchospasm occurs nebulised salbutamol 5mg may be used +/- IV Aminophylline up to 250mg given very slowly over 10-20 mins) NB: Aminophylline is rarely required due to rapid adenosine half life.
- Severe chest pain (where possible inject Radio-nuclide tracer when symptomatic so that imaging may be performed when patient is clinically improved)
- Marked ST changes on ECG (usually >2mm ST depression with normal baseline, 3mm for abnormal baseline)

In the case of severe reactions, medical help should be sought urgently.

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07/10/22