

## **Myocardial Perfusion Scan** **(Exercise or Pharmacological Stress)**

### **Introduction**

- Myocardial perfusion scan is used to assess the regional blood supply to the heart muscle through the coronary arteries. It helps to diagnose coronary artery disease (CAD) and assess its severity.
- This examination involves scanning after stress and in rest state. A stress test may be in the form of treadmill exercise or pharmacologically induced by a drug (dipyridamole / dobutamine / adenosine / regadenoson).
- A radioactive drug is injected intravenously. Its distribution in the heart muscle reflects the blood supply and can be detected using a Gamma Camera.

### **Procedure**

- An intravenous catheter is inserted on the forearm or hand. ECG leads and blood pressure cuff will be connected.
- Patient will have to exercise on a treadmill machine or receive drug injection if not suitable for treadmill exercise. The stress test is supervised closely by a doctor. The electrocardiogram (ECG), blood pressure and pulse will be monitored during and for some time after the stress test. At peak stress, a radioactive drug will be injected via the venous catheter. Additional drug called aminophylline may be given when significant side effect from dipyridamole / regadenoson occur, beta-blocker for significant side effect from dobutamine. Aminophylline for adenosine stress is rarely required but may be given if significant side effect does not resolve after cessation of infusion.
- Scanning will then be taken afterwards using a Gamma Camera.
- After this, the patient can have a light meal and take rest for 3 to 4 hours. The second scanning in the rest state will be taken in the afternoon.
- Occasionally, another injection of radioactive drug and a third scanning may be required.
- The order of procedure may vary: scanning in rest state first in the morning, followed by scanning after stress in the afternoon, or on two separate days.

### **Potential risks and complications**

The potential risks of this study lie in the treadmill exercise or pharmacological stress.

Stress by exercise:

The risk of non-fatal or major cardiac complication (e.g. cardiac arrhythmia requiring resuscitation, heart failure, prolonged angina, or heart attack) is approximately 2 to 10 in 10,000 tests. The chance of death as a result of exercise test in average patient is approximately 1 in 10,000 although the risks of complications and death may be higher in patients who are known to have severe coronary disease.

Stress by Dipyridamole (Persantin):

More than 50% of patients develop minor side effects (e.g. flushing, chest pain, headache, dizziness or hypotension). The incidence of high-degree AV and SA block is about 2%. The risk of fatal or non-fatal myocardial infarction is 5 each in 10,000 tests.

Stress by Dobutamine:

The common side effects are chest pain, palpitation, headache, flushing, dyspnea and significant supraventricular or ventricular arrhythmias. The risk of non-fatal myocardial infarction is 1 in 1,000 tests. A few deaths with dobutamine stress test have been reported.

Stress by Adenosine:

Minor side effects are common and occur in approximately 80% of patients. The common side effects are flushing, chest pain, dyspnea, dizziness, nausea and symptomatic hypotension. The incidence of second-degree AV block is 4% and complete heart block is less than 1%. Fatal or nonfatal myocardial infarction is extremely rare. New onset/recurrence of convulsive seizures has occurred infrequently. Cerebrovascular events have been reported.

Stress by Regadenoson:

The most common reactions are headache, shortness of breath, and flushing. Others include chest discomfort, chest pain, angina, dizziness, nausea, and abdominal discomfort. Individual incidences of myocardial ischemia, infarction and transient ischemic attacks have been reported.

### Before the procedure

- You have to sign informed consent for this examination.
- Please follow the instruction of your referring doctor to withhold beta-blockers, calcium channel blockers, nitrates and dipyridamole for 2 days before this examination; and withhold methylxanthine-containing medications (e.g. theophylline) for 1 day.
- No caffeine-containing drugs (e.g. Saridon, Panadol Extra, Doloxene Co) and caffeine-containing beverages and food (e.g. tea, coffee, cola, chocolate etc.) for 1 day before this examination.
- Fast for 4 hours before this examination, only water is allowed, no tea and smoking.
- Please put on sport wear and sport shoes for this examination.

### After the procedure

- After the examination, you can resume taking medication, normal activities and work.
- The scan report will be sent to your referring clinician. You will be explained the result of this examination during your follow-up appointment.

### Remarks

- This is general information only and the list of complications is not exhaustive, other unforeseen complications may occasionally occur. The risk quoted is for general reference only.
- If a complication developed, another life-saving procedure or treatment may be required immediately.
- For further information please contact your doctor.