INTRODUCTION

Exercise stress testing is a simple, safe and reliable diagnostic tool for the evaluation of patients with known or suspected coronary heart disease. It is the most common diagnostic procedure for the evaluation of coronary artery disease with an excellent safety record. The prevalence of non-fatal life threatening complications ranges from 1.4 to 9 every 10000 cases.¹,² Acute myocardial infarction after a normal electrocardiogram (ECG) responds to maximum exercise testing is quite rare with only a few cases reported in literature.³-⁸ Here a case of acute myocardial infarction occurring just after a normal treadmill test is reported.

CASE REPORT

A 51 year old male patient, smoker, normotensive, has had an attack of precordial pain at rest which had lasted for about 30 minutes. He was taken up for exercise protocol 6 days after the episode and his treadmill test was essentially normal. Ten minutes after the exercise protocol patient developed acute onset chest pain and electrocardiogram revealed inferior wall myocardial infarction. He was successfully thrombolysed. Coronary angiography done few weeks later revealed 60-70% stenosis in the mid right coronary artery which was dilated and stented with a drug eluting stent.

ABSTRACT

A 51 year old patient developed precordial pain at rest lasting for about 30 minutes. He was taken up for exercise protocol 6 days after the episode and his treadmill test was essentially normal. Ten minutes after the exercise protocol patient developed acute onset chest pain and electrocardiogram revealed inferior wall myocardial infarction. He was successfully thrombolysed. Coronary angiography done few weeks later revealed 60-70% stenosis in the mid right coronary artery which was dilated and stented with a drug eluting stent.

Keywords: myocardial infarction, stress test, stenosis, drug eluting stent
Figure 1. Normal electrocardiogram at the time of the consultation

Figure 2. Electrocardiogram taken just before the start of the exercise test

Figure 3. Electrocardiogram taken at peak exercise
pression (upsloping) at 9 minutes in II, III, aVF as well as V5-V6 with quick recovery in stage III. Patient did not complain of angina, did not develop any arrhythmias and his functional capacity was good. Inference was a low risk positive for inducible ischaemia with a Duke’s Treadmill Score of +5.0 (Fig. 2, 3, 4). Recovery period of 5 minutes was uneventful. As the patient was leaving the recovery room, he felt sudden retrosternal chest pain with sweating. On examination patient was found to have pallor, was sweating profusely with a pulse of 76 bpm and a BP of 80 mmHg systolic. An ECG was taken immediately which revealed ST segment elevation in the inferior leads (II, III aVF) as well as in the V5 and V6 (Fig. 5). Patient was immediately taken up for thrombolysis. Streptokinase was infused and serial ECGs were followed. ST segment returned to the baseline 90 minutes after completion of the thrombolysis with resolution of the retrosternal chest pain and normalization of the blood pressure (Fig. 6, 7). Patient was managed in the Mobile Intensive Cardiological Care Unit (MICCU) and made an uneventful recovery.

Coronary angiography done after few weeks revealed 60-70% mid right coronary artery (RCA) lesion which was dilated and stented with a drug eluting stent. Patient is on regular follow-up.

DISCUSSION

The development of an acute myocardial infarction shortly after a negative exercise stress test is extremely uncommon and only a few cases have been reported in the literature. Physical exertion has been evaluated and found to be trigger for acute myocardial infarction showing a cause effect relationship between the two.9,10 Arround 4.4% of patients had reported heavy exertion within 1 hour before onset of acute myocardial infarction in Mittleman’s paper9 whileas 7.3% of the patients in Willoch’s study had engaged in strenuous exercise at the onset of acute myocardial infarction.10

The pathogenesis of acute myocardial infarction following physical exertion as such is not known but is hypothesized to be multifactorial. Strenuous exercise
Figure 6. Electrocardiogram taken at the time of the thrombolysis

Figure 7. Electrocardiogram taken 90 minutes after thrombolysis
may disproportionately raise the intracapillary pressure and enhance the capillary reflex within an atherosclerotic plaque with the development of a haematoma and subsequent coronary occlusion. Exercise may induce coronary vasospasm leading to endothelial damage and subsequent platelet aggregation and thrombosis. It has also been observed that in sedentary people strenuous exercise leads to platelet activation and hyperactivity.

There have been few case reports literature of acute myocardial infarction after an exercise testing. Bruce et al described an asymptomatic individual who had an anterior acute myocardial infarction shortly after a normal performance of a maximal exercise testing. Coronary arteriography six months later revealed only minimal plaque in the left anterior descending (LAD) artery other than significant stenosis of the circumflex artery. Brown et al reported a patient who sustained an acute inferolateral myocardial infarction within 15 minutes of a negative treadmill exercise test with coronary arteriography revealing only an insignificant stenosis of the circumflex and right coronary arteries 4 months later. Tuzen et al in 1978 reported a patient with acute inferolateral myocardial infarction after 10 minutes of a normal exercise test and in whom emergency coronary angiography was done within 60 minutes of chest pain with dilatation of the occluded circumflex artery. Lintgen reported a case in whom fatal acute myocardial infarction occurred about 30 minutes after an exercise test with a normal result. Autopsy findings suggested that haemorrhage had occurred into the intimal atherosclerotic plaque with superimposed intraluminal clot formation. Nygaard et al reported a case in which acute coronary occlusion developed 20 minutes after a normal exercise test done 5 days after a successful percutaneous transluminal coronary angioplasty.

REFERENCES