

# THE ORGANISATION AND REHABILITATION OF THE POST MYOCARDIAL INFARCTION PATIENT

## SINGAPORE GENERAL HOSPITAL CARDIAC REHABILITATION WORK GROUP

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### SYNOPSIS

Thirty patients were taken into a pilot cardiac rehabilitation programme at the Singapore General Hospital over one year. Exercise testing was undertaken at least six weeks post infarct and patients entered the programme on attainment of 60% predicted maximal heart rate. Exercises were conducted thrice weekly and lasted about forty-five minutes at each session. Angina and premature ventricular contractions were noted in a minority of patients. No cardiac arrest occurred during the exercises. The study shows an exercise programme in a general hospital is safe and feasible.

### INTRODUCTION

The value of cardiac rehabilitation in the prevention of invalidism is now an accepted practice in United States, Europe and Australia (1, 2, 3, 4). In Singapore, heart disease and in particular, coronary heart disease is a major cause of disability and with low unemployment, cardiac rehabilitation becomes more important for this group of patients. In recent years, attitudes towards the management of the coronary heart disease patient has become more aggressive with earlier ambulation and discharge of the post myocardial infarction patient (5, 6). This is a report of an exercise programme over the past one year involving thirty patients with myocardial infarction.

### PATIENTS AND METHODS

Thirty patients were referred from medical units in the Singapore General Hospital and Toa Payoh Hospital over the past one year with electrocardiographic and biochemical evidence of a myocardial infarction. Their age ranged from thirty to sixty years and the period from infarction to entering into the programme ranged from six weeks to four years.

Exercise testing was performed at least six weeks after the infarct using the Bruce protocol. Patients were advised to stop medication 3 days before hand and to have no meals 3 hours before the test and on the day of treadmill to have no alcohol, GTN or tobacco smoking. Acute pulmonary embolism, myocarditis, cardiac failure, and ventricular tachycardia were consi-

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dered absolute contraindications. Achievements of 60% predicted maximal heart rate permitted entry into the programme after review by the SGH Cardiac Rehabilitation Work Group.

The exercise programme took place thrice weekly between 8.00 am - 9.00 am in the Department of Rehabilitation Medicine. Each exercise session lasted about forty-five minutes preceded by warm up callisthenics and a gradual post exercise cooling period. Each patient had his pre-exercise and post-exercise pulse and blood pressure checked by an intensive care trained staff nurse. A doctor was always present for the exercise sessions.

Equipment for the programme consisted of a three channel Hewlett Packard exercise monitor, cardiac defibrillator, manual resuscitator, oxygen and emergency medication. Health education about risk factors in coronary heart disease were given in lectures and through booklets. Each patient was given a cardio card providing information on diagnosis, ECG recording, home telephone number, and the ambulance service telephone number. Patients were taught to monitor their radial pulse rate which was taken prior to, during and after exercises.

## RESULTS

There have been no deaths from myocardial infarction following entry into the programme. There were four hospital admissions for the following reasons. The first for gastroenteritis, the second for postural hypotension from diabetic autonomic neuropathy, and di-isopyramide, the third for myocardial infarction diagnosed on marginally raised cardiac enzymes with no ECG changes, and the last patient had rebound angina after withdrawal of propranolol prior to exercise testing.

Attendance at the programme was good in the first six months with only one patient dropping out of the exercises. After six months, eleven patients discontinued with the programme as the majority had returned to work and found it inconvenient to come during working hours.

A survey of twenty-seven patients received seventeen replies. All of them expressed the desire to regain usual health, particularly in terms of physical fitness, prolongation of life and self confidence. 94% wanted to continue with the programme and looked forward to coming each morning. It was notable that several mentioned the happy situation of being able to see and talk with their doctor more frequently. While all agreed there were benefits, only 47% said it was very beneficial and 53% quite beneficial. This may indicate that the follow-up period may not have been adequate. 59% felt that dietary advice was inadequate and 94% did not receive any sexual counselling. The patients recommended more strenuous exercises, a change of venue to avoid monotony, evening sessions for those working and an increase in the exercise sessions to five times a week.

## DISCUSSION

Thus at the end of one year the development of an exercise programme in the environment of a gymnasium in a rehabilitation medicine department of a

general hospital was safe and feasible. The value of such of a programme in improving psychological well being and improving return to work has been demonstrated by many studies.

The exercise programme was supervised by a physiotherapist who took the patients up a graded exercise regime within the limits of an exercise prescription. An intensive care nurse was present to monitor the pre- and post-exercise pulse and blood pressure and any detection of arrhythmia would immediately be brought to the attention of a doctor who would be present at the sessions.

The problem of a cardiac arrest and sudden death is of great interest to those involved with cardiac rehabilitation programmes. Cardiac defibrillators, medication, oxygen and intensive care trained staff are always immediately available. The doctor covering the programme should be familiar with the interpretation and management of arrhythmias and be able to initiate cardio-pulmonary resuscitation (CPR). In America, many coronary clubs are not covered by doctors as patients have accreditation in advanced life support care. As participants proceed towards community cardiac rehabilitation programme, CPR training for participants will be of increasing importance. Stamler has reported on studies from various coronary clubs in the United States showing good results in selected group of individuals (7).

Major expenditure on equipment, for example, three channel exercise monitor, cardiac defibrillator, and a treadmill were essential requirements for the development of a cardiac rehabilitation programme.

The area of exercise and its relationship with prognosis in ischaemic heart is still controversial, however, the trend of epidemiological studies has shown that occupations and leisure activities associated with physical exercise have a protective effect in the presence of coronary heart disease (8, 9, 10, 11). Concomitantly, it is also known that the benefits of exercise can be completely negated by untreated hypertension and continuation of the smoking habit. Thus rehabilitation must consist of monitoring all the risk factors that may predispose the patient to another attack. Several studies from post myocardial infarction clinics have tended to show statistically insignificant decrease in mortality by concentrating on hypertensive therapy and anti-smoking advice (12). However, Kallio from Finland has gone one stage further and shown that organised after care control of hypertension, anti-smoking and dieting advice as well as an exercise programme with special emphasis on optimum medical control and health education contributed significantly to a decrease in sudden deaths over a three-year follow-up period and in particular in the first six months (13).

The trend of evidence would suggest that a comprehensive rehabilitation programme may improve prognosis in coronary heart disease. Physicians are beginning to accept exercise as a form of management in coronary heart disease (14). Historic marathons are riot scenes and the doctors even have their jogging club (9). Those runners do not know whether they will live longer but they feel better for it. This may

represent the signs that Virchow describes as the turning point of culture into new directions. The eighties will tell us whether this will be true.

#### ACKNOWLEDGEMENT

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