

# REHABILITATION AFTER MYOCARDIAL INFARCTION (HEART ATTACK)

## Introduction

Rehabilitation after myocardial infarction (heart attack) is uneven because the policy is not firm in view of the magnitude of the problem and its boundaries being illdefined. However, post-infarction rehabilitation must be started from the onset of acute illness and be continued until optimal physical performance and when appropriate satisfactory physiological adjustments have been achieved.

**Definition:** Cardiac rehabilitation is defined as the process by which patients with cardiac disease are restored to optimal physical, medical, psychological, emotional and economic status. In short, the sum of activities required to ensure them the best possible mental and social conditions so that they may, by their own efforts resume as normal a place as possible in the life of the community.

**The Need:** Every domestic, social, psychological and economic pressure dictates that patients who survive acute heart attack should return as quickly as possible to a normal life style and as normal a life-span as possible.

**Approach:** Rehabilitation after heart attack is complex and requires a comprehensive involvement of early diagnosis and institution of appropriate therapeutic and educational component of the case. The concept consists of supervision and explanation, early ambulation, physical exercise programmes, psychological support, secondary prevention and return to prior occupation and daily living activities. Cultural and socio-economic differences in different geographic areas impose adjustments and modification in countries with limited resources. Every aspect of the patient must be taken into account. Rehabilitation cannot be regarded as an isolated form of therapy, but must be interpreted with the whole treatment of which it constitutes only one factor.

## **Prolonged bed rest vs. Early ambulation**

Protracted strict bed rest was thought mandatory for survival of patients with acute heart attack. During the first half of the 20th century, prolonged bed rest of at least six weeks was thought necessary. Levine and Levine and Lown (1944) for the first time stressed the beneficial effects and absence of risk of rest in a chair from the end of first week after the accident of acute myocardial infarction. Progressively, the concept of early mobilisation was developed and usefulness of training programme was accepted.

## **Side effects of prolonged bed restz**

It was soon recognised that prolonged bed rest decreases physical work capacity; enhances sinus tachycardia (increase in heart rose) and orthostatic hypotension (fall of blood pressure on standing) which result after a period of bed rest due to loss of normal postural vasomotor reflexes and hypovolaemia-plasma volume decreases to a greater extent than the red blood cells resulting in increasing blood viscosity and predisposition to thromboembolism. Bed rest also decreases leg muscle pump. Pulmonary ventilation decreases modestly at bed rest due to decrease in lung volume and vital capacity. Negative nitrogen and protein balance produced by bed rest adversely affect the healing of necrotic wound area of the myocardium (heart muscle). Skeletal muscle mass, muscular contraction strength and efficiency are reduced.

## **Advantages of early ambulation**

The anticipated benefits from early ambulation are decrease in deconditioning effects of protracted bed rest, thromboembolic complications and emotional complications-anxiety and depression. Early ambulation means shorter hospitalisation, improvement in functional capacity at the time of hospital discharge (exercise testing if desired) and earlier and most complete return to work.

## **Convalescent Phase**

Accordingly, uncomplicated patients of heart attack normally stay in hospital for an average period of 12 to 15 days, the first 4 to 5 days in the intensive coronary care unit.

Low level physical activity is encouraged during the first 7 to 10 days and during the 3rd to 4th week patient visits the hospital when ordinarily

exercise ECG testing and echocardiographic exercise tests are done whenever such facilities exist. Instructions in pulse counting and safe levels of pulse rate and dyspnoea (breathlessness) are given and he is allowed to have unsupervised exercise and by 6th to 8th week patients are normally reassured with exercise testing (85% of the maximum predicated testing). Based on exercise response and physical requirements of the job, they return to work.

### **Physical conditioning and the place of exercise testing**

Regular accustomed exercise is safe for cardiac patients and they may undertake any exertion for which they are trained.

Exercise testing is essential for the scientific study of physical effort and is a valuable addition to clinical assessment during rehabilitation. Heart rate, blood pressure, oxygen intake, ventilation and subjective stress may be measured while the patient is monitored by electrocardiogram during graduated exercise on treadmill or bicycle ergometer. When the apparatus is not available, pulse rate measurements and clinical observation while exercise is being performed on stairs or on a gradient are useful guides. Patient must be informed about the possible benefits, methods and precautions of physical exercise.

- (a) Though it is not known whether sustained fitness prolongs life, prevents reinfarction, benefits in angina, morale and physical ability seem definite. Further more, patients who are otherwise in good physical condition may well tolerate a further infarct (heart attack) better than those who are not.
- (b) Patients may safely exercise after heart attack provided they do it carefully and increase the intensity gradually.
- (c) Upper levels of fitness are desirable but not mandatory and light regular exercise is better than none.
- (d) Unaccustomed heavy exercise is dangerous.
- (e) Adverse weather conditions, a full stomach and psychological upset may dangerously interfere with physiological response to exercise.
- (f) Any interruption such as minor illness must put the training schedule back temporarily to a lower level.

- (g) Energetic sports should not be resumed in an aggressively competitive way.

There is no clearcut evidence that driving heavy goods vehicles as opposed to private cars has proved more hazardous either to the driver or to the public. Patients and physicians alike are often restrained in their attitude to sexual behaviour but the relatively high incidence of impotence that occurs after acute heart attack should not be ignored. Sometimes impotence appears to develop from fear and anxiety or as a side effect of drug therapy. Physiological studies indicate that the cardiovascular cost of conjugal sexual intercourse in middle aged men with ischaemic heart disease is relatively modest. However, the level of isometric muscular activity varies from patient to patient. Guidance on resumption of sexual activity should be positive rather than the 'Let's see what happens approach'.

Return to work after a heart attack is the most important milestone. Economic independence and return to accustomed pattern of life and role in society are the indices of recovery (60% return to work within 4 months and 80% of survivors are working again within 10 months). The causes of delay in returning to work may be physical (heart failure and angina), anxiety, depression and social psychological redundancy, discouraging advice and habits of friends, relatives, doctors and employer. Initially shorter working day is better than light work.

### **Patient's commitment and coping treatment**

Patient's commitment is most challenging and interrelated with life changes. Successful rehabilitation of the patient may sometimes require the combined skills of the cardiologist, cardiac surgeon, nurses, social worker, dietician, psychiatrist and industrial doctor and an epidemiologist.

The measure that would help the patient to improve the coping technique is education of patient and anticipation of 'Home Coming Depression' and its remedial measure. Counselling and tranquillizers, instructions on physical activity and relaxation greatly improve the morale of patients. The bottom line of coping is common sense.

### **Modification of conventional risk factors**

The object of modification of risk factors is to reduce further nonfatal and fatal heart attack, sudden cardiac death (SCD); prevention of post infarction

angina and other vascular and non-vascular diseases. Modification of risk factors also provides important psychological support by reducing anxiety about the possibility of further heart attack and SCD. Conventional risk factors include smoking, systemic hypertension, diabetes mellitus, obesity, stress and exercise. One should also pay attention to associated non-vascular conditions such as hypothyroidism, anaemia, chronic obstructive lung disease, peripheral vascular disease and arthritis whenever they exist.

### **Coronary Prone Behaviour (CPB)**

Modification of coronary prone behaviour and its clinical application is imperative among subjects with Type A behaviour. It has to be stressed that CPB is not inherent payable trait but a coping strategy. CPB is a part of psychic life-style and is always inter-related with the many life changes required of the cardiac patient after the acute episode. Modifications of CPB include pharmacotherapy, counselling in group, relaxation techniques and exercise training-preferably under the anticoronary club.

Stress is the adaptive tension resulting from interaction between individuals and their environment. Thus the efforts for stress reduction should be aimed at (1) recognition of the interactive situation; (2) the elaboration of its meaning and implication; and (3) the generation of a response. Hard end points of modification of risk factors are reduction in mortality and reinfarction morbidity and soft end points is the quality of life.

### **Quality of life**

Quality of life after heart attack depends upon three factors (1) objective function: This constitutes mobility, independence, ability and energy for daily activities, adequate sleep and rest, participations in occupational and recreational activities; (2) Subjective perceptions: This includes happiness and contentment and analysis of the meaning of those factors; and (3) symptoms and their consequences: Recurrent clinical events after heart attack would produce physical and emotional set backs. The side effects of drugs and treatment should be constantly borne in mind.

### **Maintenance Phase**

Community of cardiac rehabilitation : Rehabilitation of cardiac patients in the community is of major importance and should be carried out on a

wide scale, since hospital resources are limited.

Role of the Government: The Government should come out with a national policy on rehabilitation which should consist of supervision and coordination programmes. (2) Business and Industry Houses : These bodies should get involved in rehabilitation programme by way of physical fitness programmes and promoting life style and behavioural modification. (3) Voluntary Organisations: Being a part of society, voluntary and non-governmental organisations have a special place in community programmes and health, education etc.,

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