

## ***Strategies to Prevent and Manage “ Heart Attack”***

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Heart attack (acute myocardial infarction) is one of the most catastrophic presentations of ischemic heart disease. It results from sudden, complete blockage of a coronary artery (blood vessel supplying the heart muscle) by a blood clot and can result in extensive damage to the heart muscle – leading to death, heart failure and related complications.

There have been significant improvements in managing a heart attack. This has resulted in considerable reduction in death rates if treatment is initiated early. However in spite of these developments more than half of the patients die suddenly within 1 hour of the onset of chest pain before they can even seek medical help. It is a scientifically proven fact that the mean age of our population which gets heart attacks is at least 10 years younger than what is seen in the developed countries. 25 – 30% of heart attacks seen in South Asian countries occur below the age of 40 years, the corresponding figures from the west are less than 5%. Over 80% of the patients with heart attack in our milieu belong to low and middle income groups, meaning thereby that this disease is not restricted to only rich people as was previously believed.

It is therefore very important to apply preventive measures to minimize the chance of getting a heart attack.

Recent epidemiological studies have clearly shown that the risk factors which can lead to heart attacks are globally consistent. INTERHEART study (An International study conducted in 52 countries with 25% recruitment from South Asia) has identified nine easily measured risk factors associated with more than 90% of the risk of a heart attack. These risk factors are as given below.

**A) Adverse risk factors**

- 1) Cigarette smoking
- 2) High blood pressure
- 3) Diabetes mellitus
- 4) Obesity
- 5) High levels of blood cholesterol
- 6) Psychosocial stress

**B) Protective risk factors**

- 1) Physical activity
- 2) Consumption of fruits and vegetables
- 3) Moderate alcohol consumption

**Smoking (Tobacco Use)**

The incremental risk of getting heart attacks is common to all users of tobacco. The risk is same whether one uses filter or non filter cigarettes, beedies, pipe/cigar or chews tobacco.

The risk however increases with the number of cigarettes/day smoked. Smoking 1 – 9 cigarettes increases the risk 1.5 times. 10 – 19 cigarettes/day increases the risk by 2.7 times and smoking >20 cigarettes/day increases the risk 5 folds.

Within 3 years of quitting smoking the risk attributed to smoking ceases to exist. Cutting smoking prevalence in the society by even 10% is more cost effective than setting up 30 specialized hospitals. Public education to curb this habit needs promotion.

### **High Blood Pressure (Hypertension)**

The optimal blood pressure at all ages in both the sexes is 120/80 mmHg or below. Every 20 mmHg increase in blood pressure doubles the chance of a cardiovascular event. It is therefore very important to keep the blood pressure as close to the target of 120/80 as possible. Some of the important non – drug measures to achieve it are (a) regular exercise (b) eating a diet low in salt (less than 4-5 gm salt per day) (c) diet rich in fruits and vegetables (d) alcohol in moderation (e) weight reduction. Adoption of these measures can reduce the blood pressure by 20 mmHg, which is equivalent to the use of 2 drugs.

People with blood pressure more than 140/90 despite a trial of these measures for more than a few months need addition of drugs. Currently available drugs are in general very safe but are to be taken regularly for a very long term often life long.

### **Diabetes**

A diabetic without heart disease is equivalent to a non – diabetic with a heart attack in terms of future risk of getting serious outcomes like death or a disabling stroke etc. This is true not only for a long standing patient with this illness but also for a recently diagnosed diabetic.

Diabetes is a major healthcare problem in South Asia with at least 10% of the population already affected and the increasing incidence is alarming. India is often called as the “ World Capital of Diabetes” .

A meticulous blood sugar control is the key to minimize the risk of a heart attack or related problems. Regular exercise dietary modifications and proper medication when required under supervision is the key to minimize the vascular complications of diabetes mellitus. Maintaining glycosylated hemoglobin to levels below 7% is the best method of ensuring a good sugar control. This test requires to be done once in 3 months.

### **Dyslipidemia**

High blood cholesterol is a very important cause of coronary events including heart attacks. 1 mg increase in cholesterol level increases the chance of a heart attack by 2%.

The lipid (fat) content of blood consists of the following important constituents. Total cholesterol, LDL cholesterol (bad cholesterol), HDL cholesterol (good cholesterol), and triglycerides (ugly cholesterol).

It is important to keep the total cholesterol levels below 150 mg , low density lipoprotein (LDL) cholesterol level below 100 mg and triglyceride levels below 150mgs. HDL cholesterol should be more than 35 – 40 mgs. In high risk patients the targets are even lower. High risk individuals are patients with diabetes, hypertension, known heart disease, people with family history of heart disease etc. Recent studies indicate that keeping LDL-C below 70 mgs minimizes the risk of a heart attack in such individuals.

Diet and exercise are very important measures but high risk individuals need addition of drugs of the statin group (atorvastatin, simvastatin, etc.) under supervision. These drugs have reduced the incidence of heart attacks and brain strokes by >30%.

### **Obesity**

Overweight measured as body mass index and another important parameter termed as abdominal obesity, defined as a waist hip ratio. The cutoff of waist hip ratio in men is generally taken as 0.90 in men and 0.85 in women. There is a significant relation between obesity and heart attack. Abdominal obesity is seen frequently in our population. Weight reduction by regular exercise and consumption of heart healthy diet is the best method of maintaining ideal weight.

Avoiding obesity is a very cost effective way of reducing heart attacks. Measures have to start from childhood.

### **Psycho Social Stress**

Rapid urbanization and the changing social fabric in our society lead to heightened levels of stress both mental and physical. This includes stress at home, stress at work and depression.

This leads to many adverse factors like diabetes, hypertension, adverse lipid levels, and increased coagulability of blood. This results in a chance of getting a heart attack.

Measures to reduce stress levels need encouragement. These include regular exercise and technique of de stressing like meditation and regular healthy habits.

### **Physical Activity**

Individuals are judged to be physically active if they are regularly involved in moderate (walking, cycling or gardening) or strenuous exercise (jogging, football or vigorous swimming) for 4 hours or more a week.

Individuals engaged in these activities regularly, have a reduced chance of getting a heart attack as per the data of INTERHEART study. Physical activity should therefore be encouraged from young age.

### **Consumption of Fruits & Vegetables**

Consuming 2 to 3 servings of fruits and vegetables per day is a negative risk factor in the causation of heart attacks. Fruits and vegetables are good sources of natural antioxidants and vitamins besides being low in calories. Regular intake of these items helps in reducing total calorie intake and possibly retards the process of atherosclerosis and clot formation in coronary arteries. Drugs claiming to be containing anti-oxidants and heart protective vitamins like vitamin E and beta carotene etc have not shown to be useful. This fact needs to be emphasized and consuming fresh fruits and vegetables (not synthetic vitamins) especially greens need to be encouraged.

### **Alcohol Consumption**

People who consume alcohol regularly (3 – 4 time/week) are protected from heart attacks. The degree of benefit however is modest. The type of alcohol consumed (including red wine) has no relevance in this regard.

Adoption of healthy life style and preventive strategies can go a long way in reducing the incidence of heart attacks and related problems like angina and heart failure. The treatment modalities of established coronary artery disease have improved considerably during the last 20 years. Procedures like angioplasty, drug eluting stents, coronary artery bypass surgery (beating heart surgery, key hole surgery, robotic surgery) have considerably improved the symptomatic status of these patients but most of them are at best palliative and very expensive.

The burden of ischemic heart disease in our country at present is approximately 6 crores and the number of angioplasties and bypass surgeries done in our country annually is less than 85,000. The importance of preventive strategies which are much more cost effective and practical is thus very relevant. These measures should begin early in life to have maximum benefit for the society.

***What are the Measures to have minimum complications and improve survival after a heart attack??***

Heart attack occurs when a partially blocked artery gets suddenly completely occluded by a blood clot. This results in complete stoppage of blood supply to a portion of the heart muscle. This can result in death, heart failure and severe weakening of heart resulting in shock and resulting complications. The symptoms of heart attack are sudden onset chest discomfort, shortness of breath, unconsciousness, often with profuse sweating and vomiting. Early recognition and prompt treatment are extremely important to reduce the mortality. The mortality rate can be as high as 20 to 25% if the treatment is inadequate or improper. Most of the deaths occur within the first one hour after the onset of chest pain.

The best and the easiest method to diagnose heart attack is electrocardiography (ECG) and a few specialized blood tests which can be carried out at the bed side with instantaneous results.

Once the diagnosis is established the treatment should be directed towards pain relief and at restoring the blood flow in the blocked artery at the earliest. If this can be achieved within 1 to 2 hours of the onset of chest pain and ECG changes the results are excellent with mortality dropping to 2 to 3% only. Admission in a hospital with coronary care unit (CCU) at the earliest is very important. Disorders of cardiac rhythm leading to very fast heart beat ( tachy arrhythmias ) or marked slowing of the heart rate (brady arrhythmias) which can lead to sudden death can be promptly recognized and treated in a CCU. First 24 hours after a heart attack are crucial and need continuous ECG monitoring.

Aspirin (300 to 325 mgs) chewed at the onset of heart attack is a useful agent and has been shown to lower mortality. Like wise another oral medicine called clopidogrel enhances the efficacy of aspirin. The sheet anchor of the management however is administering clot buster

medicine or performing angioplasty at the earliest to clear the blocked artery.

Time is very important in deciding which treatment has the best result. "TIME IS MUSCLE". First hour after the onset of chest pain resulting in attack is also called the "Golden Hour". Clot buster medicine (streptokinase, urokinase, tissue plasminogen activator etc) administered as an intravenous injection

works very well if administered within 2 hours of the onset of attack. Its results at this stage are equivalent to those of angioplasty. This method is easier, more cost effective and can be applied rapidly to a much larger patient population not able to reach a specialized center within shortest possible time. In fact there is a place to start this treatment before even reaching the hospital in properly equipped ambulances.

The management after 2 to 3 hours however starts becoming difficult. Angioplasty along with stent placement becomes a better method of preserving heart muscle. Administration of clot buster medicines have very little to offer if the early opportunity has been lost. Angioplasty is clearly the only method to save the heart if the delay in starting the treatment is more than 4 hours and is less than 12 hours after the onset of chest pain. Angioplasty also has clear superiority over clot busters in patients who have low blood pressure, very compromised heart muscle function, patients with recent brain strokes or bleeding tendencies. Patients who present more than 12 hours later often have already suffered a permanent damage to the muscle.

The modern methods and concepts have lowered the mortality rates of heart attack patients substantially. It is however very important to evolve strategies so that the proven methods of effective treatment can be made available to patients of acute myocardial infarction as early as possible. This needs organizational efforts in the form of regional Heart attack centers served by a very effective ambulance service available round the clock. Treatment strategy can be decided by remote control as soon as the diagnosis is made from these centers. Suitable cases must be administered clot buster drugs and shifted to the nearest hospital attached to the heart attack center. Patients who do not respond within 90 minutes of the start of treatment or had a delay in starting the initial treatment need to be shifted for angioplasty at the earliest. Patients who are not suitable for angioplasty because of advanced blocks at multiple sites often need coronary artery bypass surgery.



The treatment following successful initial treatment " Clot buster treatment or Angioplasty" is also very important. Need for continuation of aspirin , clopidogrel giving specific medicines to prevent a recurrence ( beta blockers , ace Inhibitors , cholesterol lowering drugs etc ) are very important to maintain the good results .

Diabetics and patients with high blood pressure need very aggressive blood sugar control, and blood pressure control to achieve targets. Dietary counseling to keep the cholesterol levels very low and intake of heart healthy diets are also a part of the treatment.

Rehabilitation after a heart attack is also an integral part of the treatment. In uncomplicated cases with successful initial treatment prolonged hospitalization is not required. Patients can be discharged on 4<sup>th</sup> or 5<sup>th</sup> day and after a brief period of rest. At home should lead a normal life and resume their full activities.

Each patient needs a supervised management as per the amount of muscle damaged by the attack.. The advice for the exercise regimen, resumption of office work, traveling, sexual activities etc need counseling by the treating doctor. Echocardiography and nuclear scans performed periodically gives a good guideline of recovery and treatment strategy for the long term. Many patients treated by clot buster medicines need coronary angiography followed by angioplasty or bypass surgery electively.

Heart attack is a common problem faced by the community. Young people often are affected. Its aftermath affects the whole family. Early recognition and prompt treatment is very essential in order to minimize its complications and prevent its recurrence. Every minute lost in managing it is losing opportunity to save the dying heart muscle.