

Recent Advancements in the care of Patient with Coronary Heart Disease

By

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THERE was nothing much known about coronary heart disease in the past. It was in 1876 Dr. Adam Hammer of 'Ga' diagnosed the first coronary thrombosis at the bed side and later proved at autopsy. After several decades of research, there is so much advancement going on in the care of patient with coronary heart disease. Epidemic of coronary heart disease is a threat to the population all over the world. "Diseases of coronary arteries have become the one greatest threat to life and was really responsible for more than 560,000 deaths—or one third of all deaths—in the United States last year"¹. "About 15 million people suffer from definite heart disease and about as many more from suspected heart diseases"². A high percentage of those are in most productive years of life. It is to be noted that all forms of career, together caused less than half this number—240,000 deaths. Coronary heart disease is the nation's number one killer.

The average healthy adult male has about one chance in five of getting a heart attack before the age of 60. Though men in general are much more susceptible to coronary heart disease than women, after menopause women are found to have a higher ratio. All ages may be affected, but the fourth decade seems to present the peak incidence. Even though the symptoms may appear suddenly the heart condition may be pre-existed for several years. The coronary heart disease pain is continuous and is not relieved by any home remedies. Patient perspires due to pain, and nausea and vomiting may associate. Within minutes many patients describe dyspnoea and marked weakness. Sudden collapse may take place with acute

infarction. Haemoptysis, systemic embolisation and non-original chest pain are the less common symptoms.

When there is an infarct anywhere in the body, the normal conduction of the heart is affected. Normally, impulses starting from S.A. node—heart pacemaker—go to A.V. node pass through the bundle of His into bundle branches, Purkinje system and musculature of ventricles. Here polarisation and depolarisation take place causing the heart to beat rhythmically. Any deviation from the normal rhythm is known as arrhythmia, about which a nurse specialist should be well aware of.

People get coronary heart diseases due to various reasons. Cardiac arrhythmias can occur in extreme coldness and hence the reason for heart attacks in people while shuffling snow. Stress induces heart attack. "High drive, over ambitious, time stressed persons are especially susceptible to premature coronary heart disease. Other recent investigations have also implicated social and cultural factors"³.

A study on a group of Japanese staying in Japan, Hawaii, and U.S.A. showed higher incidence of C.H.D. in the group living in U.S.A. This may also have something to do with the dietetic habits. Hypercholesterolic (above 200-210 mg/Ml) people have 3-4 higher incidence of heart attack. Though cigarette smokers have a greater incidence of C.H.D., it is interesting to note that those who have stopped smoking have less percentage than those who never have smoked. The reason for this is left to the readers thinking.

Elevated B.P. increases the risk of C.H.D. Likewise diabetes and

peptic ulcer could be associated with C.H.D. Though C. H. D. is not hereditary, early detection and effective action is of the greatest importance when one or more of the cited risk factors are present.

Diagnosis could be ascertained by the history and clinical signs and symptoms. An E.K.G., chest X-ray and blood tests will confirm the diagnosis.

Until the advent of cardioversion, drugs were the only means of terminating arrhythmias. It is a procedure where the heart beat is regulated to its normal rhythm by electric shock. A history of the use of some kind of a defibrillator goes back to over 60 years where in 1899 Dr. Battelli stopped ventricular fibrillation in dogs. (The principle of defibrillation is more or less the same as that of a cardioversion). The first successful defibrillation of human heart was done in 1947 by Dr. Beck.

Clinically, a patient who is having ventricular fibrillation loses consciousness within 10-15 seconds and also loses heart sounds, pulse and blood pressure immediately. Since this is also true of ventricular asystole, one would be at a loss to know what to do in the absence of an electro-cardiogram.

In this situation one would have to give assisted respiration and external cardiac massage while an electrocardiogram was being taken and the reason for cardiac arrest ascertained. "Experimental and clinical evidence indicates that with prompt and effective treatment, the use of closed chest cardiopulmonary resuscitation and adjunctive measures, the survival rate can be increased to 50-75 per cent."⁴. Biological death of human brain occurs about four to six minutes after

sudden cessation of the circulation of oxygenated blood. Absence of pulse, apnoea and dilatation of the pupils are the signs of clinical death. The technique consists of :

- (i) establishment and maintenance of a patent airway
- (ii) vigorous ventilation of lungs ; and
- (iii) rapid reinstitution of oxygenated blood flow by external cardiac compression.

To ventilate the lung, head should be extended and the nurse breathes for the patient at the average rate of 10-15 inflations per minute. Inflation pressure seldom need to exceed 15-20 cm. of water. A blow on the lower end of sternum rarely stimulate the heart to start. If not, should be proceeded by cardiac compression along with ventilation effectively and continuously with pauses only for such procedure as the use of the defibrillator. For external cardiac compression, patient is placed on a firm surface. A food tray under the patient is preferable. The resuscitator places the heel of his hand on the lower sternum (T7 and T8). The heel of the other hand is placed over that of the first. Positioning himself over the patient, the resuscitator uses his body weight in applying pressure to the adult at a rate about 60 times per minute in such a vertical force as to move the sternum $\frac{1}{2}$ -2 c.m. downwards.

By now "Ar. pacemaker" call for the cardiac arrest is announced, and the nurse specialist has more help. Defibrillation should be done immediately. Defibrillation is a therapeutic modality which is life saving, which is safe both for the patient and for the nurse. It must be established as a nursing procedure which nurses can administer at the critical moment. Defibrillator is a modern electrical equipment with two paddles which delivers 7000 volts of D. C. current to stimulate the myocardium to function. One paddle is placed posteriorly in the left interscapular space and the other anteriorly on the right side. Electrode paste is applied on the paddle. The pressure is adjusted to not above 100.

Repeat at 10 second interval if needed. Improvement could be noted by return of patients electrocardiogram. Cardiac death may be assumed only when there is no return of electrocardiogram after one hour of procedure. However termination of the procedure should be done only at the discretion of a doctor.

Intravenous drugs like epinephrine, isoprel and calcium bicarbonate are useful at the time of cardiac arrest. Epinephrine stimulate the myocardium to start beating. Isoprel increases the heart rate and the calcium bicarbonate counteract the acidosis present.

In case of cardiac shock, non-epinephrine is good as it raises the peripheral blood pressure.

Intravenous xylocaine 4 mg. per minute at 30 drops one minute in 50 c.c. of 2% solution is recently found to be very effective for ventricular tachyarrhythmias. Xylocaine has rapid action within 20-30 seconds and lasts approximately 20 minutes. Maximum dose is 750 mg. per hour. Side effects are increased tachycardia if given fast and central irritability in larger doses.

Quinidine is very good for atrial arrhythmias. Though it helps to slow down the heart rate, could be hazardous in toxicity.

Digoxin also regulates the hearts pacing and its oral preparation is a drug of choice especially in case of atrial tachycardia. It is slowly absorbed. It also could be hazardous in its toxic dosage and cause bradycardia and even complete heart block.

Artificial pacemakers are found to be useful permanently as well as temporarily for the pacing defects of the heart. "Due to rapidly broadening knowledge of electronics, a variety of transistorised and subcutaneously implantable devices known as artificial cardiac pacemakers have been developed to combat disorders of hearts conduction system."⁵ These pacemakers continuously stimulate ventricular contraction by means of batteries. In one type of pacemaker, the rate is set up at 70 per minute while the other type paces only if patient's heart stops. In permanent

pacemakers batteries need changing approximately within five years.

Nursing care of heart disease patient should ideally be in a special coronary care unit, where there is facilities for proper monitoring of patient. At the second Bethesda Conference of the American College of Cardiology held in December 1965, it was the consensus opinion that as many as 45,000 coronary patients will be saved each year when coronary monitoring units are established throughout the United States. In hospitals, after the establishment of coronary monitoring units, mortality rate has been lowered between 30-40 per cent. When a C.H.D. patient is being monitored in order to better evaluate his progress and if he understands this, he accepts the equipment and is often pleased with the specialised observation. Patient slowly gets used to the 'peep' sound of the monitor and thus he assumes that he is doing well. It is the nurses' responsibility to warn the patient about the alarms that may occur, if anything goes wrong with the connection in order to avoid unnecessary panic.

Ideally there should be one monitor for each patient which is connected to the patient by means of at least three electrodes attached externally on crossline with the heart. It consists of oscilloscope and pulse-rate meter integrated with an audiovisual alarm system. A direct electrocardiogram is synchronised to automatically printstrips during alarm situations or print normally when desired. Through the use of a memory tape loop, it is possible to obtain E.K.G. occurring on alarm situations.

When the patient is being monitored, the nurse and the doctor can ascertain instantaneously and at any given moment the status of patient's condition, for example, the nurse specialist observes the premature beats early enough so that treatment can be instituted immediately preventing further progress.

In the care of the patient on monitor, the nurse specialist concentrates on the patient as a whole

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