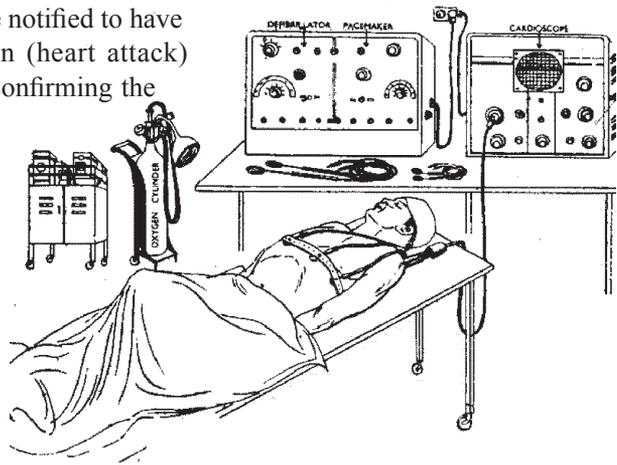


INTENSIVE CORONARY CARE UNIT

Today in many centres all over the world intensive coronary care units are organised and run effectively. The objects of these units are twofold: (1) to study the haemodynamics and behaviour of the cardiovascular system to various drugs, manouvres and methods of treatment during acute myocardial illness; and (2) To monitor all patients with myocardial infarction and to install appropriate remedies immediately a warning is sought.

Set-up of Intensive Care Unit

The unit consists of a limited number of beds in order to ensure quality of work. A part of such unit is depicted diagrammatically in Fig. 1. An adequate number of trained nurses and doctors manage the unit round the clock. Patients once notified to have a cardiac infarction (heart attack) are admitted after confirming the diagnosis by a thorough clinical examination and an ECG tracing. A chest x-ray is usually taken as a routine. Irrespective of their clinical conditions, patients are put



SHOWING A SET-UP OF INTENSIVE CORONARY CARE UNIT (DIAGRAMMATIC)

to bed and continuously monitored.

ECG monitoring — Continuous ECG monitoring is done by one of the lead tracings which is fed into a cathode-ray oscilloscope. Oscilloscopic monitoring could be coupled with an ECG complex. An automatic alarm system works beyond an adjustable range of pulse rate. This has an advantage in drawing the attention of staff around and in the neighbourhood.

Blood pressure—Blood pressure is recorded frequently at regular intervals. For research purposes, continuous recording of intra-arterial pressure screened on the oscilloscope is to be preferred. Estimation (continuous or intermittent) of blood oxygen saturation, pH, CO₂ and bicarbonate level, etc., is also being done.

Period of monitoring is usually restricted to the early days of convalescence, but each case is decided on its individual merit.

Research data—Factors influencing the haemodynamics of heart have been poorly understood in health and more so in myocardial illnesses. Appreciation of the fact that intracardiac catheterisation is relatively a safer procedure both in health and disease, and the emergence of newer and simpler tools and techniques in measuring the intracardiac pressures, oxygen saturation, pH, CO₂ and cardiac output, etc., have given a wider scope for research. With the introduction of continuous monitoring, it is also possible to have a continuous recording of all these data in addition to isolated investigations.

Some of the results obtained by these methods are interesting and revolutionary. In one such meticulously done studies (Hammersmith Hospital, London) it was illustratively proved that morphia may not be the drug of choice in myocardial infarction as it tends to lower the venous pressure and consequently reduce the cardiac output. Another conclusion that was drawn was the beneficial effect of oxygen on the haemodynamics of cardiovascular system. There was also lack of correlation between the cardiac rate and peripheral resistance, blood pressure and cardiac output.

In spite of considerable progress in the field of analytical study, there still remains quite a lot to be done. To cite only a few are pulmonary function studies in myocardial infarction, effects of transfusions on

cardiovascular system, place of heparin, effects of exercise and place of muscle pump in myocardial infraction.

Therapeutic considerations- The nucleus of the monitoring is the continuous ECG recorder which is fed into a cathode-ray oscilloscope. An automatic alarm system has an added advantage as discussed before. In most of the advanced centres a DC defibrillator (cardioverter) is made use of. This instrument has invariably an oscilloscope incorporated. A high voltage current up to three hundred Joules or even more could be delivered with good risk. The time delivery of the current could be synchronised with any of the components of ECG. A cardiac pacemaker (both internal and external) often forms a part of the machine for emergency purposes.

Oxygen cylinders, Boyle's apparatus and an emergency cardiac trolley consisting of essential drugs, including ampoules of sodium bicarbonate, propranolol, calcium gluconate, adrenaline and hydrocortisone should be made available at hand.

Within a couple of seconds of warning, the patient is attended to and the nature of arrhythmia ascertained. In cases of supraventricular and ventricular tachycardia immediate cardioversion is done under a mild intravenous pentothal anaesthesia. The electrodes are placed over precordial region and adequate amount of current is passed by a push button mechanism. It is important that the timing of current passage is synchronised with R or S complex of ECG as ventricular fibrillation may be induced if there is an accidental synchronisation during depolarisation (T wave). A good conduction of current across the chest is facilitated by reducing the skin resistance by a liberal application of jelly to the electrodes.

In the event of a ventricular fibrillation prompt and quick defibrillation should be done while taking care to see that a good supply of oxygen is delivered to the lungs. Systemic acidosis should be corrected by frequent intravenous sodium bicarbonate. If there were to be any delay in defibrillation, life must be maintained by external cardiac massage, artificial respiration and correction of acid base balance.

Diagnosis of ventricular fibrillation is confirmed by electrocardiographic evidence. Successful electrical countershock defibrillation depends upon the healthiness of the myocardium, adequate supply of oxygen and correction of acid base balance and electrolytes. Intravenous calcium gluconate 10 per cent. (10 ml.) through external jugular vein would rectify an otherwise

resistant electrical countershock fibrillation. Contrary to the accepted belief adrenaline in small doses (intracardiac) could be expected to improve the myocardial contraction.

When the cause of alarm is heart block, the electrodes of external cardiac pacemakers are placed over the precordium and the required voltage of current and heart rate are adjusted in order to maintain physiological circulation. If the cardia does not revert to sinus rhythm within a couple of hours, an intracardiac (right heart) electrode is introduced percutaneously (*via* external jugular vein or antecubital vein) and the voltage and cardiac rate maintained suitably.

The incidence of atrioventricular dissociation after acute cardiac infarction is about 60 per cent with a mortality of 60 per cent. This mortality could be halved by pacing, most of the patients return to sinus rhythm and only a few remain in permanent heart block. Temporary pacing for acute heart block after cardiac infarction is relatively a simple technique. It is imperative that all centres undertaking intensive coronary care unit should have facilities for emergency pacing. The opinion as to when to

NIFEDIPINE IN ANGINA - A CLINICAL TRIAL

The effect of nifedipine was investigated in 50 patients (12 female and 38 male) with frequent incapacitating anginal pains. 26 patients had earlier propranolol therapy with poor results in 14 and undesirable side effects in 12. Nifedipine was added to propranolol therapy in the former 14 and in the latter 12 persons was replaced by nifedipine; 8 patients dropped out of the trial and in two the drug had to be discontinued in view of the side effects. Among the 40 who have completed the trial the response was very good in 18, good in 11, fair in 9 and nil in 2. The clinical improvement was associated with significant reduction in the requirement of isosorbide dinitrate, improved effort tolerance and ECG changes at rest and after exercise.