

swasth hind

July 1985

- * Coronary artery disease
- * Coronary artery bypass surgery
- * Bloodless operation in blood vessels
- * Stroke
- * Rheumatic heart disease
- * Combating rheumatic diseases effectively
- * Let us talk about salt
- * A year for the youth

HEART DISEASE

swasth hind

Asadha-Sravana
Saka 1907

July 1985
Vol. XXIX No. 7

OBJECTIVES

Swasth Hind (Healthy India) is a monthly journal Published by the Central Health Education Bureau, Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India, New Delhi. Some of its important objectives and aims are to :

REPORT and interpret the policies, plans, programmes and achievements of the Union Ministry of Health and Family Welfare.

ACT as a medium of exchange of information on health activities of the Central and State Health Organizations.

FOCUS attention on the major public health problems in India and to report on the latest trends in public health.

KEEP in touch with health and welfare workers and agencies in India and abroad.

REPORT on important seminars, conferences, discussions, etc., on health topics.

Editorial and Business Offices

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(Directorate General of Health Services)
Kotla Marg, New Delhi-110 002.

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Articles on health topics are invited for publication in this Journal.

State Health Directorates are requested to send reports of their activities for publication.

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SUBSCRIPTION RATES

Single Copy	25 Paise
Annual	Rs. 3.00

(Postage Free)

Heart disease is an important cause of disability and deaths in our country. It is estimated that more than 5 percent of registered deaths in India are due to heart disease and that 6,43,625 Indians died of heart disease in 1978. The percentage distribution of death is more than that of all categories of cancer, which is 2.5 per cent.

CORONARY ARTERY DISEASE

Some Aspects of Medical Treatment

PROF. M. L. BHATIA

MANY types of heart disease exist. One of these is coronary artery disease, i.e., disease of the heart consequent to disease of the coronary arteries. The conservative estimates of its prevalence in our country in the general population above the age of 40 are 2.5%. If this is so, then the risk group consists of 136.9 millions, of which 3.42 millions have the disease. At the estimated population growth, the number of such persons in 2000 A.D. will be 10.13 millions—a large number indeed. The number could be much more keeping in view the rapidly increasing number of patients with this disease seen by doctors all over India.

Coronary artery disease, as said earlier, is consequent to the disease of the coronary arteries. Coronary arteries are the blood vessels which provide the heart with the oxygen and other nourishment it needs. The heart is basically a hollow pump which by its action of contraction and relaxation pumps blood throughout the body providing nourishment to all organs and cells. Blood flows out from the heart through the arteries and returns to it through veins. As blood leaves the heart, the first artery it passes through is the aorta, and the coronary arteries branch off from it. These arteries wrap around the heart and carry blood into every part of the heart muscle.

Cause of coronary artery disease

Many diseases affect the coronary arteries. Of these *atherosclerosis* or hardening of the coronary arteries is the commonest cause accounting for more than 90% of coronary artery disease. In course of time, fatty materials (specially cholesterol, a waxy looking fat commonly present in animal fats and oils, in yolk of egg and in many other foods) stick to the inside walls of the arteries. They may start forming plaques. The process starts early in life and progresses slowly over a lifetime. When the lumen of the artery becomes significantly narrow (50% or more) by this clogging the flow of blood through the artery is markedly reduced, affecting blood flow to the heart muscle. The result is coronary artery disease.

Risk factors

There is still much to learn about the causes of coronary artery disease, in other words, about the causes of atherosclerosis. Available information suggests that certain factors in a person's background or life style make the likelihood of developing coronary artery disease greater. These are called risk factors.

Many such *risk factors* have been identified. In general it seems that the combination of several risk

factors rather than any particular risk factor increases someone's chances of developing coronary artery disease.

Some risk factors cannot be helped, and therefore cannot change. These are called the *unmodifiable* risk factors, which include a family history of coronary heart disease, the male sex and age above 40 years. More important are the *modifiable* risk factors which are controllable. These often result from one's life style, the things one eats and the things that one does. The important ones of these factors are:

- High blood pressure
- Cigarette smoking
- Raised levels of blood cholesterol
- Overweight
- Increased stress and tension in life
- A sedentary life style

Of course not everyone with some or even all these factors will develop coronary artery disease, and some people with coronary artery disease may not have any of these factors. In fact only about 50% of the people with coronary artery disease have one or more such risk factors. But the risk of developing coronary artery disease is greater if the risk factors are present and the more the risk factors, the greater the risk. Combination of risk factors is not simply adding them; it is more like multiplying them.

While a lot is known about coronary artery disease and risk factors, even more remains unknown. However, there is much evidence that by lowering the risk factors the disease may be kept from progressing. These are the precautions one can take, which will make a difference.

Presentation of Coronary Artery Disease

Coronary artery disease affects a person in many ways. There is no standard set of presentation of coronary artery disease (CAD) for every patient. However, the usual ways in which its presence is felt are:

- Angina
- Heart attack (myocardial infarction)
- Irregularity of the heart
- Heart failure
- Sudden death

Angina is the important aspect of this serious heart disease. It is medically called, *angina pectoris*.

Angina

Angina is one of the several possible results of coronary artery disease. It is the name given to the discomfort which results when the heart muscle temporarily does not get enough blood and oxygen; when the supply of blood and oxygen are not adequate to the heart muscle's requirement. This discomfort is the heart's "distress signal".

Presentation of angina

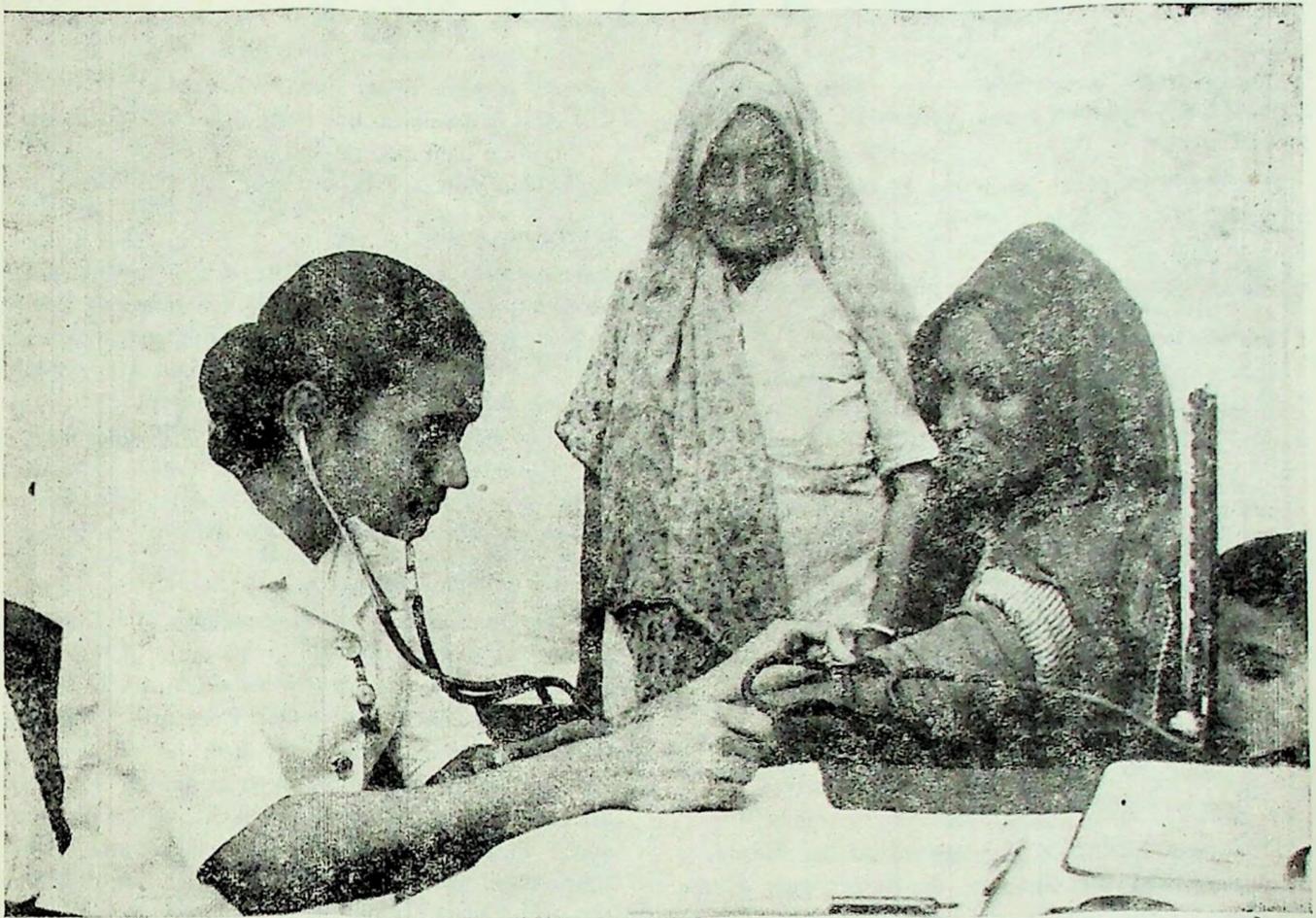
Anginal discomfort is often called 'pain' but it may be felt differently by different persons. It may thus be felt as a mild discomfort, a dull ache in the chest or something else entirely like extreme tiredness, indigestion, burning, squeezing, heaviness, fullness, or tightness in the chest, upper stomach or throat, or as heaviness and a sensation of weight in the arms, specially on the left. It is described by some as a choking sensation, shortness of breath or pain in jaw, gums, teeth, throat or in the neck between the shoulders.

The location of the anginal discomfort and its severity also varies from person to person. It may occur in one or several places. It may start at one location and travel to others. The anginal episode is generally short, lasting for 2 to 5 minutes. Its frequency may vary from once in several weeks to many attacks per day.

The types of activities which bring an angina attack vary from person to person. Most of these activities make the heart work harder (increasing heart rate and blood pressure), and thereby increase its requirements of blood supply which cannot be met because of restricted blood flow through the clogged arteries.

Some common activities which may present angina are:

- Exercise or exertion
- Heavy meals
- Walking uphill or up a staircase or walking in cold weather or against a strong cold wind.
- Stress, fight, anger and other emotional conditions.
- Sexual intercourse.
- Being in a higher altitude.



One of the important risk factors of coronary artery disease is high blood pressure. It must be controlled by drugs or without drugs, as is required

"Angina" and "heart attack" are different

Angina and heart attack are not the same thing although the underlying cause, viz., disease of the coronary arteries, is common to both. Angina is caused by a temporary reduction in the amount of blood and oxygen that reaches the heart, most commonly due to a narrowed coronary artery. An anginal episode is not life threatening and it does not permanently damage some part of the heart muscle.

On the other hand, a heart attack results from a complete or almost complete deprivation of blood and oxygen supply to a part of the heart for a long period (generally for more than 30 minutes). After this

period the stoppage is complete and sustained. The part of heart muscle so affected dies, and is later replaced by scar tissue. A heart attack is a 'life threatening' situation.

Diagnosing angina and coronary artery disease

It is common to begin with a history of the symptoms and then perform a physical examination. The history provides the most useful information and helps not only in diagnosis but also the identification of its severity, degree of incapacity suffered, other disease factors present, etc. Such a history includes not only the patient's problems but also a detailed family history. Physical examination is detailed and

HEART ATTACK

HEART attack is lay man's term for coronary occlusion, thrombosis or myocardial infarction in medical terms.

Heart attacks occur when the blood vessel (Coronary artery) supplying fresh blood to the heart for its nutrition is suddenly blocked off, thereby cutting off the blood supply to a part of the heart muscle.

Cause of a heart attack

The commonest disease leading to such situation is atherosclerosis wherein fat (cholesterol) is deposited on the inner lining of the coronary artery. The gradual accumulation of the fat may ultimately compromise the lumen sufficiently enough to interfere with blood flow. When the blood flow ceases suddenly due to the obstruction, the result is a heart attack.

Warning signals of a heart attack

The usual warning signals are :

Uncomfortable pressure, pain, fullness or burning sensation in the centre of the chest for several minutes or longer, generally at rest. It may be shortlasting or persist for hours.

Discomfort and pain may spread to the shoulders, arms, jaw and sometimes to the upper part of the abdomen.

Severe pain, dizziness, fainting, vomiting, sweating, or shortness of breath may accompany the above feelings. Sometimes these may be the only sensations without any significant chest symptoms.

The signals may not always be present or severe. In many instances they may subside to return hours or days later.

The signals of heart attack are not the same for everyone and may vary from very intense for one to mild symptoms for another. These are not infrequently misinterpreted as indigestion.

What to do in case of a heart attack

Heart attack can strike anyone. When it occurs there is no time for delay. Most heart attack victims survive if they recognise the early warnings of heart attack and get prompt medical attention. *Therefore, get help immediately.* Reach your doctor or a hospital casualty department as soon as you can. Tilt you get, medical attention:

- Avoid physical exertion.
- Rest in a comfortable position,
- Loosen tight clothes, and
- Avoid chill or excessive heat.

Emergency care

Hospital care is the safest for a heart attack victim. Most modern hospitals treat such patients in a coronary care area where special equipment, drugs and trained medical, para-medical personal are available to look after the patient. With prompt and proper care, the heart begins to heal. New blood supply to the damaged part is established. Later scar tissue forms at the site of the damaged area. The process of healing varies from person to person.

What is to be done later

Rehabilitation can begin sometimes after the heart attack. It requires the full cooperation of the patient as well his family with the doctor-nurse-dietitian and physical instructor team. The patient may require medication, changes in diet and physical activity and other measures. A firm family support is essential and a positive outlook is of great importance. Patients who recover from a heart attack sometimes have to change their lifestyles. *Most of them return to work.* Continued guidance and follow-up by the doctor is important. It varies from each individual, varying according to a long term health plan drawn by the doctor for the patient.

Prevention is best

Everyone can reduce the risk of a heart attack since atherosclerosis can be prevented or slowed by decreasing coronary risk factors. High blood pressure, a diet high in cholesterol and saturated fats and cigarette smoking are important risk factors of heart attack. Daily stress, obesity and lack of exercise are also disadvantageous. Most of these are correctable. Unchangeable risk factors include age above 45 years, male sex and heredity.

By changing one's lifestyle and correcting the risk factors that one can control and improve the chance of living a longer, healthier life.

Prevention of a heart attack is the best way of dealing with it. **It is never too late to change harmful habits. Decide today.** △

◁ includes checking of weight, blood pressure, pulse, listening to the heart and lungs etc. to determine the state of general health and signs of heart disease and its complications.

Diagnosis also includes conducting several tests. These include a blood sample analysis for blood sugar, cholesterol and other chemicals, an X-ray of the chest for ascertaining heart size, a resting electrocardiogram and an exercise ECG. The last is of special importance in diagnosing heart disease including coronary artery disease.

An exercise ECG shows how the heart reacts to exercise. In many persons with angina the resting ECG may not show any change, but specific changes become manifest in the exercise ECG. Analysis of these changes and the degree of exercise in tolerance is very useful in diagnosing and quantifying the severity of coronary artery disease.

Radioisotope scanning of the heart shows how much blood does the heart pump with each heart beat and also the size, shape and contraction of the heart. It may show specific areas of decreased blood flow due to coronary artery disease.

Cardiac catheterisation and coronary angiography provide a precise indication of how well the heart is functioning and pinpoint the arteries which are narrowed, the degree of such narrowing and the site of the blocks. This test is always done before a surgical procedure like bypass surgery is taken up.

Medical treatment of coronary disease

(i) Control risk factors

Control of risk factors is essential. The high blood pressure must be controlled by drugs or without drugs, as required. Changes in life style and dietary changes are helpful, like cutting down on the salt consumption in the diet and losing weight if the person is overweight. Cigarette smoking is specially harmful. Not only it is an important coronary risk factor, but also the smoking may precipitate or worsen

angina, cause irregular heart beats and reduce chances of recovery after a heart attack. Stopping cigarette smoking can repair some of this damage. It is never too late to give up smoking. It should also be noted that no cigarette is safe.

(ii) Dietary Control

Adequate dietary control should be exercised regarding calories, the quantity and quality of fats and salt intake. To avoid too much fat and cholesterol it is necessary to eat lean meat, fish and poultry, reduce the amount of eggs and organs meats like liver and limit use of butter, cream and other saturated fats. Fried food should be limited or avoided. Extra salt on the table should not be used. Losing weight is beneficial and can be achieved by controlling diet and a judicious amount of exercise. Exercise increases the capacity of doing physical work with lesser degree of circulatory stress and strain; it increases physical stamina. The amount and type of exercise required varies from one person to another and is best prescribed by your doctor.

(iii) Controlling Stress

Control and reduction of stress is necessary. Adopting a simpler life style, taking a weekend off, regular vacations, more time for fun and recreation, pursuing active hobbies, relaxation exercises, Yoga, transcendental meditation, etc., which help in physical and mental relaxation, are extremely beneficial.

(iv) Drug treatment

Drugs are often required for treatment of CAD condition. For short term and immediate benefit nitrates like nitroglycerin are used under the prescription and advice of the doctor. For long term benefits, the drugs like beta blockers or calcium blocking drugs are currently used. The need for these drugs and the quantity required varies from patient to patient, which can be best decided by your doctor. It is important that you follow the prescribed regimen—when and how much. It may also be necessary to develop a schedule, if many drugs are used, so that you are not confused and do not miss the drugs. ◁

“Be bold, and face The Truth!
Be one with it! Let visions cease,
Or, if you cannot, dream but truer dreams,
Which are Eternal Love and Service Free”.

Swami Vivekananda

Treatment for coronary artery disease aims at improving blood supply to the heart muscle. Usually these goals are met through medications and changes in life style. But if these do not help and angina continues to interfere with everyday life, surgical treatment is to be considered, and the result may be quite satisfactory. The possibility of surgery depends upon several factors including the overall condition of the heart.

CORONARY ARTERY DISEASE

Coronary Artery Bypass Surgery

PROF. P. VENUGOPAL

CORONARY artery bypass grafting is the most effective means of directly increasing the blood supply to the ischaemic heart muscle. Since 1968 when the procedure was first performed, over a million of such operations have been performed all over the world and currently this is the procedure of choice for the management of this widely prevalent and often fatal disease.

What is coronary bypass surgery?

The heart muscle gets its blood supply from the aorta through three main coronary arteries. Two are on the left side which are branches of the left coronary artery. The single artery on the right is known as the right coronary artery. Branches of these arteries ramify throughout the heart and provide oxygen-rich blood to nourish the heart muscle. When any of these main arteries gets blocked by coronary artery disease then there is decreased blood supply to an area of heart muscle and this produces angina. Coronary bypass surgery (grafting) is a procedure by which alternate blood channels are created surgically which carry blood from the aorta to the coronary artery bypassing the obstruction, thus restoring blood supply to the heart muscle. The conduit used for this bypass is usually the saphenous vein from the leg,

which because of its superficial location and length is an ideal conduit for this procedure. Removal of the saphenous vein from the leg does not cause any significant disability as other veins in the leg quickly take over its function.

Advantages of coronary bypass surgery over medical therapy

The advantages of surgery are manifold. Briefly they are:

- (a) Relief of angina with less or no medication.
- (b) Improved quality of life.
- (c) Increased longevity.
- (d) Reduced risk of repeated heart attacks.
- (e) Correction of associated complications like ventricular aneurysm (dilatation of the heart muscle), mitral regurgitation (leaking of the valve), ventricular septal defects (hole in the heart membrane), etc., which cannot be corrected by medicine.

The most significant advantage of surgery is that the constraints on physical activity are removed and the patient can lead a normal life, and even engage himself in activities which involve physical exertion.

The fear of 'heart attack', which hangs like the 'Sword of Damocles' over the head of every coronary patient, is completely eliminated by surgery.

Indications for surgery

Surgery is indicated in the following circumstances:

- (1) Angina unrelieved by medication.
- (2) Triple vessel disease.
- (3) Left main stem disease.
- (4) Complications of myocardial infarction.

The indications for coronary artery surgery have broadened over the years as the risk of the operation has decreased considerably. Surgery is advisable in all patients with symptomatic coronary artery disease. In such cases surgery provides relief of symptoms. However in certain situations like main stem disease (also known as 'widow-maker disease') and in severe triple-vessel disease the life expectancy on medical treatment alone is quite low; hence surgery is life-saving in this case. The 10-year survival with triple-vessel disease is only 20% without surgery whereas with surgery the 10-year survival becomes 80%. Likewise the risk of sudden death in patients with left main stem disease is more than 50% in one year. Surgery provides long term relief in these patients. Complications like ventricular aneurysm and mitral regurgitation can be corrected only by surgery.

The surgical procedure

The operation is carried out under general anaesthesia. The first step of the operation is to remove the saphenous vein from the leg, tie off all the branches and to test it for any leakage. Then the chest is opened by cutting across the breast bone (Sternum) and the heart is exposed. For performing the delicate suturing between the coronary artery and the saphenous vein, a still, bloodless field is essential. This is achieved by connecting the patient to a heart-lung machine by special tubes. This machine takes over the function of the heart and lungs while the surgery is being performed. The heart is stopped and cooled with ice-cold saline. Portions of saphenous vein are then sutured between the aorta and the coronary arteries bypassing the block or the obstruction. (Each of these is known as a graft. The number of grafts required is determined by the number of main vessels blocked, which is determined by coronary arteriography). The heart beat is then restored and the patient

is disconnected from the heart-lung machine as soon as the heart starts beating effectively. The chest and leg wounds are then closed systematically.

Preparation for surgery

Best results are obtained only if the patient is optimally prepared for surgery—both physically and mentally. Patient and family counselling is part of the preoperative preparation to allay the fears of the patient and his family members, and also to gain the patient's confidence. The physiotherapist plays an important role in preparing the patient for surgery. He teaches the patient breathing exercises and leg

Coronary bypass surgery (grafting) is a procedure by which alternate blood channels are created surgically which carry blood from the aorta to the coronary artery bypassing the obstruction, thus restoring blood supply to the heart muscle.

exercises which must be strictly performed in post-operative period. A thorough check is made for any associated illnesses like diabetes, hypertension, chest infection, dental infection etc., which are fairly common. These have to be controlled adequately before surgery to prevent any complications. The patient is usually admitted a few days prior to the scheduled date for operation so that all the above preparations can be made. In addition, the patient gets acclimatized to the hospital atmosphere and also gains confidence and strength by seeing and talking to patients who have already undergone surgery.

The postoperative course

The first 24—48 hours are spent in the intensive care unit after which the patient is transferred to the postoperative ward. The patient is able to eat a light meal in the following morning after the surgery and by evening he is made to walk about the ward. It is during this period that the maximum cooperation of the patient is required. Breathing exercises that have been taught must be performed religiously

and the patient must make every effort to be up and about. The physiotherapist plays an invaluable role during this period. Over the next few days the patient is gradually able to perform routine activities and is discharged after removal of all stitches on the tenth day after operation. A certain feeling of physical weakness is expected during the postoperative period. However, a good diet and graded exercise can soon overcome this problem. By six weeks the patient should be able to return to his work.

Common problems during this period

(a) *Chest pain*: This results from the movement of the ununited cut-ends of sternum (breast bone). This pain usually subsides within six to eight weeks by which time the cut-ends of the bone unite. Analgesics like Proxylon or Analgin will relieve this pain.

(b) *Swelling of the legs*: This results from venous congestion in the legs after removal of the saphenous vein. To prevent this the patient must wear elastic stockings or a crepe bandage whenever he is standing or walking. When he is sitting he must keep his feet elevated on a stool. Swelling usually subsides by 3-6 months.

(c) *Breathlessness*: The body usually takes a few weeks to recover from the effects of a major surgery. Till then it is wise not to over exert and to take rest at frequent intervals. This usually subsides in 6-8 weeks.

Do's and don't's after surgery

1. *Do not smoke at all*: It accelerates coronary artery disease and may lead to blockage of the grafts.
2. *Drinking*: Alcohol is best avoided, but if it cannot be given up, restriction to two ounces a day is desirable.
3. *Heavy exertion* like driving, lifting weights, cycling, etc., should be avoided for at least six weeks after surgery.
4. *Sex*: There is no restriction on sex as long as the patient feels fit. Undue pressure on the sternum, however, must be avoided in the initial period after surgery.

Experience at the A.I.I.M.S.

Over the past three years more than 160 patients have undergone coronary artery bypass surgery at the All India Institute of Medical Sciences (A.I.I.M.S.). The number is increasing rapidly and currently we are performing four to five such operations every week in addition to other types of open heart surgery. The patients who have undergone surgery have mostly been referred when they have been severely symptomatic and have advanced disease. Thus more than 80% of these patients have had severe triple vessel disease. 28 patients had obstruction of the left main coronary artery disease which, as has been mentioned, carries a very high risk. About 40 patients were under 45 years of age.

On an average every patient has received four grafts. In addition some patients required other procedures like endarterectomy in 32, valve replacement in 6, and removal of a left ventricular aneurysm in 9 patients.

Despite the severity of disease in these patients the results have been very good. The overall mortality is 3-4% which is comparable to reports from the advanced centres in the west. If patients come in the early stage of the disease the risk of the operation is negligible.

On follow-up 90% of the patients are free of angina and have returned to gainful occupation. Repeat coronary arteriography, done in a small group of patients, shows that the grafts are patent in the majority of the patients.

Coronary bypass surgery at the AIIMS costs each patient approximately Rs. 12,000. This is towards the cost of the disposable items required during the surgery. No charge is levied on account of operation. This is a negligible amount compared to the cost of getting the same surgery done at USA which is Rs. 3.3 to 3.5 lacs. We believe that coronary bypass surgery is a safe, effective and reliable mode of treatment for coronary artery disease, and we at the Institute are capable of offering it safely and economically to the public. Δ

BLOODLESS OPERATION INSIDE BLOOD VESSELS

IOSIF RABKIN

A NEW branch of medicine—X-ray endovascular surgery—has turned a traditional diagnostician, X-ray expert, into a physician. The new method, which is, in many cases proves as efficient as classical surgery, is free of the latter's undesirable consequences in addition. Application of this method makes it possible to revive what seems to be a doomed patient within literally a few days' time. Here are two examples of that kind.

Short-circuiting of blood

About four years ago a patient with a connection between the spinal artery and a vein which had appeared as a result of an injury was admitted in the All-Union Centre of Surgery. The blood which had already passed through the heart was short-circuited, returning from the artery to the vein through this connection and back to the heart, thus straining it additionally. As part of this blood never reached the lungs and, therefore, was not oxygenated, the patient suffocated. However, the main danger was an arterio-venous aneurysm (A local broadening of a blood vessel with extremely thin walls), which could result in profuse bleeding any time. To save the patient that vessel enclosed among vertebrae had to be closed. The question was in what way we could reach it. Of course, we might have hollowed the backbone to reach the artery, but we were apprehensive of damaging the cerebrospinal nerves next to it. When damaged, they may cause paralysis. It also happens that as soon as the surgeon reaches the aneurysm it will burst... Surgeons and neurosurgeons refused to perform the operation, so the patient was transferred to our department.

First time in world

No one in the world had ever performed such a surgery before. Under continuous X-ray control we

introduced a conductor (a twisted metal string) into the femoral artery. The conductor passed through the common iliac artery, long thoracic aorta, left subclavian one and finally entered the left spinal aorta. A catheter was put on the string and reached the aneurysm along it. The string was removed, and a contrast agent was administered through the catheter to make some X-ray photographs of the aneurysm and the blood short-circuit in order to put a more precise diagnosis. After that some minute steel spirals, each 5 mm long and 2 mm in diameter, were introduced through the catheter in a stream of the same contrast medium. Those spirals had woollen threads fixed to their ends, like tails. The display showed the spirals reaching the fistula and stopping it. The short-circuit between the artery and the vein ceased to exist, and the aneurysm shrank. The operation was over: it lasted only 25 minutes. A day later the patient was allowed to go for a walk, and a few more days after the operation we discharged him from the clinic.

Difficult operation

Another operation, which was also performed at our department for the first time in the world, dealt with autoimmune haemolytic anaemia. The spleen of a patient suffering from that disease starts "devouring" the erythrocytes (red blood cells), thus causing leukaemia with a lethal outcome. The usual treatment for it would be an operation to close the blood vessel supplying blood to the spleen. When the vessel is blocked, the spleen stops functioning, shrinks to the size of a walnut and does no more harm to the organism. The problem is that the spleen artery is situated behind the pancreas or within it, which make surgery much more complicated.

The woman who was admitted to our department would hardly have survived such an operation. She had been treated by hormones for two years, and the

course of the disease was complicated by the consumption of the adrenal glands' cortex. We performed that operation jointly with our colleagues from the Institute of Haematology and Blood Transfusion. A catheter was inserted into the spleen artery through which artificial thrombi reached the vessel and embolised (stopped) it.

Pieces of teflon, or emboli, with the volume of 2 to 3 cubic millimetres, were sprayed into the catheter together with the physiological solution by a hypodermic. The number of emboli was determined by the length and the diameter of the vessel. As soon as the emulsion was administered to the artery it caused the formation of thrombi which stopped it tightly—we could see it on the display of our X-ray installation. Having made sure that there were no blood stream in the artery, we removed the catheter from it. The operation lasted for only half an hour. Whereas a traditional surgery would have taken at least two hours. The erythrocyte and blood cell expenditure in the patient's body dropped by 50 per cent, and the haemoglobin contents increased. Five weeks later the number of erythrocytes in her blood was back to normal.

Broadening narrowed arteries

It is a tradition in classical surgery to examine the patient thoroughly before the operation. As for X-ray endovascular surgery, which is not surgery in a proper meaning of this word but rather a hybrid of

roentgenology and therapy, it combines diagnostication with treatment. A catheter is used to administer a contrast medium and all the compounds necessary for treatment, and often to perform an operation. Thus we used a catheter with a tiny reservoir filled with a contrast medium to perform dozens of surgeries to broaden stenotic (narrowed) arteries. Under the pressure of the medium reaching 5 to 8 atmospheres the reservoir blows up in the narrowed part of the vessel thus pressing the cholesterol particles into its walls. The opening broadens up and a normal blood stream in it is restored.

Of course, far from all vascular disorders can be treated by endovascular techniques. In many cases cholesterol sediments are too old and hard. In such cases the treatment is useless, but, unlike a surgical interference, it does no harm to the patient.

It is actually impossible to enumerate all the diseases which can be cured by the new technique. It is non-traumatic, sparing and works quickly. It can be used to treat ischaemia, renovascular hypertension, congenital embolism of the lung artery, alternating lameness and profuse bleeding. It can also block a sick kidney to stop its functioning.

Over 120 centres of endovascular surgery have been set up in the USSR. Besides, recommendations have been developed to make it possible to apply this technique in cases of emergency actually at any hospital. Δ

ANAEMIA AND HEART

Anaemia, if severe (haemoglobin in blood less than 5 gms. per 100 ml), and especially when of acute onset, can produce symptoms and signs of heart disease. The patient may tire easily, suffer from breathlessness on exertion, palpitations, oedema of feet, giddiness, heart pains (angina), enlargement of the heart, heart murmurs, and even heart failure. Patient may also exhibit ECG changes suggestive of a heart attack. But all these signs and symptoms disappear when the patient is given blood transfusion, or when anaemia is controlled with medication, suggesting that these changes are reversible. When patients of ischaemic heart disease, rheumatic heart disease, congenital heart disease (blue babies) etc. have anaemia, all the signs and symptoms are aggravated. Hence, correction of anaemia, whenever present, is an important step in treating these patients.

—Heart News
April 1985

Stroke or cerebro-vascular accident is a disease of the brain resulting from the abnormalities of blood vessels. Blood vessels constitute arteries, veins and capillaries. Arteries carry the oxygenated blood from the heart to various organs of the body, and veins bring back the used blood from different organs to the heart and then to lung for oxygenation and removal of carbondioxide.

STROKE

DR M. C. MAHESHWARI

ACCORDING to world statistics, Stroke is the third commonest cause of death in the past middle age group people. The other two causes are cancer and heart attack. Strokes can occur at any age, but essentially it is a disease of elderly people. Of all the strokes in India, about one-fifth occur in the age group under forty (which is called stroke in young). Exact incidence of mortality and morbidity due to stroke in India is not known, but a fair percentage is made disabled every year. Western statistics do indicate a reduction in the incidence of stroke in last two decades and this healthy trend is attributable to reduction of rheumatic heart disease and improved control of hypertension.

Brain gets almost 1/6th of the total blood, while it weighs only 1/60th of whole body weight. Brain utilizes maximum amount of glucose and oxygen for its proper functioning. Irreversible damage results if no oxygen or glucose is available to brain for three minutes. A person may become unconscious if there is interruption even for ten seconds. Brain receives this amount of blood via two carotid arteries in the front and one vertibro-basilar artery system in the back. One should appreciate that the vertebral arteries pass through the bone before entering the brain.

These two systems have communications to help in the adjustment of blood volume to both the halves as well as various parts of the brain. Blood supply to the brain is so vital that nature has given autoregulating mechanism to adjust the blood distribution.

Ischaemia and haemorrhage

Arteries (blood vessels) are the delivering pipes. Any disease process which may lead to occlusion or rupture of these pipes will result in a stroke. The disease process may either be in the lumen, in the wall or outside the wall to cause occlusion. Occlusion of the lumen wall lead to what is called Ischaemia and, therefore, *ischaemic stroke*. Rupture of the vessel will lead to haemorrhage and, therefore, *haemorrhagic stroke*. There are many factors which will influence and determine the extent of ischaemia and haemorrhage. Understanding of these factors is of utmost importance.

Blood pressure and stroke

At the critical point of occlusion if the blood pressure is low, greater degree of ischaemia will result. On the other hand if blood pressure is high, at the time of rupture, greater amount of bleeding will occur.

This means a high degree of blood pressure is as bad for a haemorrhagic stroke as low blood pressure for an ischaemic stroke. This leaves no doubt on the need of a reasonable adequate blood pressure. There are, however, some factors which are not in our control.

Atherosclerosis

As mentioned earlier there are several causes of ischaemic strokes. Atherosclerosis is by far the commonest cause in elderly patients. Atherosclerosis is essentially an ageing process which leads to hardening of the arteries. Hardened arteries lose resilience and it leads to systolic hypertension. Hypertension, diabetes, hyperlipidaemia (hypercholesterolaemia) aggravate atherosclerosis. A fair number of patients before developing the stroke have several transient ischaemic attacks (TIA) of focal neurological deficit. The TIA lasts for a few minutes in majority of the cases but never lasts more than 24 hours. These are due to microemboli with arterial occlusion or haemodynamic with relative ischaemia or acute hypotension. TIAs are warning signs before the occurrence of the stroke. This is the most important point to remember as something can be done at the stage of TIA, but nothing much can be done once a stroke has taken place. Another important risk factor which aggravate cerebral ischaemia is *smoking* and, therefore, it requires your consideration to stop smoking. For haemorrhagic stroke there are several causes but hypertension is the most important cause. Adequate control of hypertension has definitely reduced the incidence and severity of haemorrhagic stroke and benefited ischaemic strokes as well.

Diagnosis

Diagnosis of TIA and stroke is not difficult and mostly depends upon a good description by the patient or the relative. Symptoms (like paralysis, blindness, unconsciousness, etc.) are of sudden onset and after a critical period there is always a history of improvement if the person survives. Haemorrhagic strokes are more common during exertion and activity while ischaemic strokes take place during sleep and inactivity. All body parts and functional activities are represented in the brain. From the impairment of body functions a doctor clinches the site of lesion in the brain. Medical technology has really improved the diagnostic capabilities in last 10-12 years. Computer assisted angiography, CT scan, Doppler blood

flow and NMR have contributed a lot not only by providing non-invasive methods of diagnosis but also the specificity and accuracy. However, one should remember that these advanced technologies cannot replace the medical history. Therefore, observe the illness in as much detail as possible and pass on all the information to the doctor for correct diagnosis.

Stroke in young

As for the stroke in young, we in India are more concerned about the peripartum strokes, i.e., stroke occurring in women either during pregnancy or soon after birth. By and large women belonging to poor socio-economic status are affected. Some study has been done, but the exact cause remains still elusive. This is the area where research activities should concentrate.

Early treatment

As mentioned earlier one should not remain unconcerned till the stroke occurs. Treatment should be instituted with the first occurrence of TIA. There is medical as well as surgical treatment available and your doctor should take the responsibility for advising you. Prevention and management of the risk factors are of utmost importance. Specialised medical attention is of great importance in the first 48-72 hours of occurrence of the stroke. One cannot do much for the dead brain tissue. However, all attention should be paid to revive the surrounding and partially damaged tissues. This would determine the degree of recovery as well as the rehabilitative potentials. The partially damaged tissue requires adequate glucose and oxygen. Some cases do require the management of vasospasm and increased intracranial hypertension. Once the critical period is over, the only therapy then is physiotherapy. The role of physiotherapy and rehabilitation is to make the disabled person as much independent as possible in the activities of the daily living.

In conclusion, there should be awareness of the problem in the forties. Hypertension should be adequately treated. Smoking should be stopped. Transient ischaemic attacks (TIAs) should be recognised by the doctors as well as the patients and specialist consultation should be sought. Funding organizations should be alert and liberal to promote research in the areas relevant to us in India. Δ

CORONARY BYPASS SURGERY

Some Patients Require Re-operation Later

SOME of the patients undergoing coronary artery bypass surgery will require reoperation after 8-10 years, Dr G. Reul told the International Conference on Recent Advances in Cardiology and Cardiac Surgery in Bombay, recently.

Dr Reul, who is Associate Chief of Surgery at the Texas Heart Institute, Houston, was delivering a keynote address on "Coronary artery surgery—15 years' experience".

Of the 35,000 patients who received coronary artery grafts between 1969 and 1983 at the Texas Heart Institute, nearly 1,000 were reoperated for a variety of reasons, such as graft occlusion and progression of the underlying (atherosclerotic) disease.

"The patients you operate on for the first time may be back for more surgery in 8-10 years, and they may return even for the third or fourth time," Dr Reul stressed.

Reoperation carries a higher operative mortality, of about 6%, compared to the first time operation, which has a mortality rate of 1.2%. The additional risk stems from the more advanced—usually end-stage—coronary disease in patients, needing repeat surgery, sometimes caused by the patients' failure to modify their heart risk factors.

Reviewing the objectives of coronary artery surgery, Dr Reul said these were as valid today as in 1969 when he and Dr Denton Cooley performed their first procedure, namely, (1) relief of angina pectoris, (2) revascularisation of the myocardium to improve myocardial function, (3) prevention of myocardial infarction, especially in the preinfarction anginal state, and (4) prolonging life, especially for certain subsets of patients, such as those with left main or multiple artery disease.

Long-term survival

A computer analysis of the survival rate among 25,000 patients showed a gradual decrease of 1-2%

a year for the first 5-8 years and a slightly greater decrease (2-3%) thereafter. Confirming this trend, other groups have reported that after 8-12 years about 50% of vein grafts develop either occlusion or stenotic disease if they were patent at one to three years post-operatively.

"So there is a natural degeneration of vein grafts, a natural degeneration of ventricular function and a natural degeneration of the coronary arteries," Dr Reul observed.

Again, at the end of 10 years, only 34.5% of the survivors were completely free of angina. Like the survival rate, the number of symptom-free patients drop quite dramatically after 6-8 years.

It is obvious, therefore, that coronary artery surgery does not cure the patients, who must be followed up very carefully and all attempts at modifying risk factors should be made, Dr Reul said.

Age and arteries

Another finding over the years, he continued, is that mortality correlates with age: "the older the patients, the higher the mortality".

Mortality also correlates with the number of arteries bypassed, being highest in the group with double and triple-vessel bypass and lowest in patients with multiple grafts demonstrating the importance of complete revascularisation.

"The more arteries bypassed does not mean the mortality is higher. More bypasses actually end up protecting the myocardium", Dr Reul noted.

"We have also seen," he added, "that the degree of revascularisation is relatively proportional to the success of the operation". Their policy of complete revascularisation, bypassing arteries with over 50% blockage, had resulted in lower mortality and attrition rates.

(Contd. on page 175)

Rheumatic fever licks the joints but bites the heart. Rheumatic fever is an acute inflammatory disorder characterised by specific symptoms and signs, initiated by infection of the throat by a group of bacteria called 'group A Betahemolytic streptococci'.

RHEUMATIC HEART DISEASE

DR RAJEN TANDON

RHEUMATIC fever is a world wide phenomenon. It affects both sexes equally. The most common age when the fever attack is between 5 to 15 years, though it can occur at any age. Population surveys in India indicate its prevalence to be around 2 per thousand.

20 to 50 per cent of all cardiac hospital admissions are for rheumatic fever induced heart disease. Survey in children indicates its prevalence to be 5.3 per 1000 children between the age of 5 to 15 years in India.

Predisposing factors

1. Unhygienic living conditions,
2. Undernutrition & malnutrition,
3. Over-crowded living conditions.

Adverse features of rheumatic fever

1. It affects the heart in 60 to 70 per cent cases. The resulting heart disease is in general permanent.
2. The heart disease is acquired in childhood and the suffering lasts for the rest of the life.
3. Rheumatic fever has a tendency of recurrence. If heart disease is present it will get worse with each recurrence. If heart disease is not present, it can occur with a recurrence.
4. Rheumatic fever can be prevented, but if it has occurred in a child it cannot be cured.
5. The diagnosis depends on clinical findings which overlap with some other diseases.

6. There is no investigation which is diagnostic for rheumatic fever.
7. The diagnosis is possible during the acute phase. However, if the heart is not involved the diagnosis in retrospect may not be possible.
8. Once the heart is damaged, medicines cannot cure this heart disease.
9. Operative treatment for rheumatic heart disease is also not a "Cure".
10. Once rheumatic fever has occurred, prevention of further attacks will have to be continued life long (ideally).

Features indicating rheumatic fever

Ten to 15 days after the onset of the fever, streptococcal sore throat is followed. This fever is accompanied with joint pains with or without swelling, heart involvement, skin rash, nodules below the skin and abnormal movements of the body indicating brain disease.

(a) *Joint disease* : Occurs in 90 per cent cases. Large joints like ankle, knees, elbows and wrists are involved; uncommonly smaller joints of hands or feet may be involved. Only subjective pain (arthralgia) may be present or the joint may be swollen, hot, red with limitations of movement (arthritis). The pain and swelling come on quickly and subside spontaneously within 5 to 7 days. Generally multiple joints are involved in an episode although only one joint may be involved at one time. There is no residual damage to the joint.

(b) *Heart disease* : Occurs in 60-70 per cent cases. Starts early in the course of rheumatic fever. All layers of the heart are involved—the covering called pericardium, the heart muscle called the myocardium and the heart valves. The damaged valves result in leaking of blood. Over a period of time the valves may get fused resulting in obstruction to flow of blood. Damaged myocardium results in poor pumping function of the heart. Heart damage is permanent.

(c) Nodules below the skin tend to appear 4 weeks after the onset of rheumatic fever. They are not painful. They last for a variable period of time and then disappear, leaving no residual damage.

(d) Brain involvement manifests as abnormal jerky purposeless movements of the arms, legs and the body. They result in difficulty in walking, eating, writing or any finer movements. This manifestation is more common in female children. It lasts about 6 weeks and gradually disappears leaving no residual damage.

(e) *Skin*: Various types of skin rash is known due to rheumatic fever. Perhaps because of the darker complexion, the rash is rarely identified in our country.

It is thus obvious that except heart disease all other manifestations of rheumatic fever do not cause permanent damage.

Investigations

The investigations for the diagnosis of rheumatic fever are confined to two aspects: (i) To indicate the presence of an active disease (non-specific); (ii) To indicate the presence of streptococcal infection or recent streptococcal infection (non-diagnostic). There is no test which will conclusively prove that the child has rheumatic fever.

Treatment

Once initiated rheumatic fever cannot be "cured" by medicine. The treatment consists in: (i) bed rest, (ii) nutritious diet, (iii) Penicillin therapy, (iv) suppressive drugs, (v) management of heart disease, if present, (vi) rehabilitation of the patient if heart disease is present.

Rheumatic fever runs a course of about 12 weeks in 80 per cent of the patients. In 20 per cent it can be longer. Suppressive treatment is indicated for 12

weeks. Suppressive treatment reduces the inflammation but does not cure it. The two drugs used for suppressive treatment are Aspirin and Corticosteroids. Aspirin has a weaker suppressive action than steroids, but has less complications compared to steroids. We prefer to use steroids in those patients who have heart involvement, reserving aspirin for those who do not have heart involvement.

The damaged heart

Two parts show specific persisting damage—the heart valves and the myocardium (heart muscle). There is no specific medical and/or surgical treatment for the damaged myocardium.

If valves have become obstructive the obstruction can be relieved by operation. If the valve is leaking the valve may be repaired or it may have to be changed. Rheumatic valve damage is such that valve change is more likely than repair, but the decision is possible only at the time of operation.

The commonest valve damaged is the mitral valve. This valve lies between the left side atrium and ventricle. The next commonest valve affected is the aortic valve, lying between the left ventricle and aorta. Both are involved in about 25 per cent cases. Mitral valve is involved in all those who have rheumatic heart disease.

Indications for operation

The indication for operation is when the heart is not able to cope with the requirements of the body at rest or at work.

Milder damage of the valve is compatible with a normal life span. As such every patient with heart disease is not a candidate for operation. The patients require to be followed up by the physician at six monthly or yearly intervals. Electrocardiograms, X-rays and other investigations may be required from time to time. Depending on the symptoms of the patient and findings, the physician decides as to when an operation is necessary (Physicians believe that God-made valves are better than man-made valves).

Prevention of rheumatic fever

It must be re-emphasized that rheumatic fever is preventable, but once it has been initiated it cannot be cured.

Most of the developed countries have been able to control rheumatic fever and rheumatic heart disease. The decline appeared even before penicillin became available.

Non-medical means of controlling rheumatic fever are related to improving living conditions and socio-economic status :

- (1) Improve sanitation and hygiene.
- (2) Improve nutrition.
- (3) Prevent over-crowded living.
- (4) Awareness regarding hazards of sore throat and the specificity of preventing heart disease by penicillin.

Specific prevention

Specific prevention is possible with the use of penicillin.

Ideally a sore throat should be swabbed and cultured. If streptococci are present the child should be put on penicillin. Since facilities for throat culture are not easily available, it is justified to treat a sore throat with penicillin even without having the culture. For this purpose one injection of penicillin containing 3,00,000 units of crystalline, 3,00,000 units of procaine and 6,00,000 units of benzathine penicillin is enough (available as one injection). Alternatively, 4,00,000 units of procaine penicillin may be given twice daily for 10 days.

If a patient has had rheumatic fever, prevention of further attacks is possible with injections of Benzathine Penicillin given every 2 or 3 weeks. This will have to continue (ideally) life long. Less than ideal would be to continue upto the age of 35 years. The injections are painful, but the pain is less than life long suffering due to heart disease.

Adverse reactions to penicillin are very rare in children. Adverse reactions to Benzathine penicillin are also very rare.

Prevention is better than cure.

Fortunately, rheumatic fever can be prevented but unfortunately, it cannot be cured. Protect your child's heart.

1. Do not neglect sore throats.
2. If a child complains of joint pains consult a doctor immediately. The diagnosis may not be possible in retrospect.
3. If one child has sore throat, all children should be checked. Streptococcal infection is contagious, but rheumatic fever is not.
4. Unexplained fever—even in the absence of joint pain symptoms—can be rheumatic fever.
5. A fever associated with chest pain or followed by palpitation or shortness of breath in a child could be rheumatic fever.
6. If the child has had rheumatic fever it is the responsibility of the parents to ensure continuation of penicillin to prevent further attacks of rheumatic fever and further damage to the heart.
7. Penicillin injection given every 3 weeks may cause pain only for 17 days in a year. (If given every 2 weeks the pain is only for 26 days in a year).

This is certainly a much better proposition than suffering every day for that whole life. ☺

The articles on Coronary Artery Disease by Prof. M.L. Bhatia; Coronary Artery Bypass Surgery by Prof. P. Venugopal; Stroke by Dr M.C. Maheswari; and Rheumatic Heart Disease by Dr Rajen Tandon in this issue are based on Public Lectures at the All India Institute of Medical Sciences, New Delhi.

“Thou brave one, be proud, take courage, be proud that thou art an Indian and proudly claim I am an Indian, every Indian is my brother”

“The soil of India is my highest heaven the good of India is my good”

Swami Vivekananda

Rheumatic Fever and Rheumatic Heart Disease

RHEUMATIC fever and rheumatic heart disease are problems of major importance in many parts of the world. In developing countries, rheumatic heart disease is the commonest form of heart disease in young people and the main cardiovascular cause of death among children and young adults.

* Rheumatic fever is typically a disease of childhood and adolescence (5 to 15 years). It is triggered by a streptococcal sore throat or tonsillitis.

* Most cases of tonsillitis can be easily treated and cured. However, a few patients, two to three weeks after streptococcal sore throat infections, develop hot, painful and swollen joints accompanied by fever, hence the name *rheumatic fever* given to the disease.

* Sometimes the joint symptoms and fever can be so mild as to pass unrecognized. If severe, they can be brought under control with aspirin and the joints recover completely.

* Unfortunately, whether mild or severe and even when it passes unnoticed, rheumatic fever can cause permanent damage to the heart, particularly the heart valves, leading to a serious chronic condition, known as *rheumatic heart disease*. The consequences of chronic rheumatic heart disease include: continuing damage to the heart; increasing disability; repeated hospitalization, and premature death usually by the age of 35 years or even earlier.

The prevalence rates of rheumatic fever and rheumatic heart disease in school-age children usually reported from various countries range from 5 to 20 per 1000, although figures as high as 33 per 1000 have been observed. In many developing countries rheumatic heart disease accounts for over 30% of cardiac cases admitted to hospital.

* Available mortality statistics in developing countries show that rheumatic heart disease ranks high among causes of death in the age group 15 to 24 years. In many areas it is second only to accidents as a cause of death in this age group.

* In some ways, rheumatic fever can be regarded as a "social" disease: linked to poverty, overcrowding, poor housing conditions and inadequate health services. It declines sharply when the standard of living is improved, but even in the most affluent countries, there are areas where the disease still exists.

* Of all serious, chronic conditions, rheumatic heart disease is one of the most readily preventable. Two

prevention approaches are possible. *Primary prevention* consists in preventing rheumatic fever before it occurs, by identifying all patients with streptococcal throat infection and treating them with penicillin. However, this approach entails serious practical, logistic and technical difficulties, particularly in some developing countries. Furthermore, some cases of rheumatic fever occur without a clinically recognizable sore throat that can be effectively identified and treated.

* *Secondary prevention* which is a more practicable approach, especially in developing countries, consists in identifying those who have had rheumatic fever and giving them one injection of penicillin every 3-4 weeks. This prevents streptococcal sore throats and therefore recurrence of rheumatic fever and rheumatic heart disease. The cost of secondary prevention is estimated at 15 US dollars per patient per year.

* The World Health Organization (WHO) has carried out an international cooperative study in seven developing countries. This study demonstrates the feasibility and cost-effectiveness of secondary prevention.

* WHO, in collaboration with the International Society and Federation of Cardiology (ISFC) is promoting a strategy to develop national programmes for the prevention of rheumatic fever and rheumatic heart disease based on this secondary prevention approach and implemented through primary health care systems.

* As a medium-term objective, the WHO Cardiovascular Disease Unit plans to collaborate with 15 developing countries, so that by 1989, they will be able to prevent recurrences of rheumatic fever in 70 to 80 per cent of known and identified patients, by means of regular administration of penicillin. The treatment has to be continued for at least five years after the last attack of rheumatic fever or up to the age of 18 years whichever is longer.

* To be effective, a rheumatic fever/rheumatic heart disease/prevention programme must benefit from government and community support. Furthermore, experience has shown that such a prevention programme does not survive in isolation. It is doomed to failure if it cannot be incorporated into the general health services of the community. It is therefore important to involve the general public and to provide appropriate health education in order to improve case detection and patient compliance with the treatment.

—W.H.O. [△]

In order to combat the diseases effectively, the USSR set up cardio-rheumatological service in 1958. It played an important role not only in reducing the primary disease rate but also made the relapses much less on the patients. As a result, the life expectancy of patients suffering from rheumatic valvular diseases has considerably gone up, which has now reached almost at the national average life expectancy level.

COMBATING RHEUMATIC DISEASES EFFECTIVELY

K. R. SWADESHI

PEOPLE have been suffering from arthritis (polyarthritis) since the Stone Age, and it still remains an acute problem. According to an estimate, nearly one per cent of the global population is afflicted by this disease. The rapidly progressing grave and irreversible changes in various structures making up the joint can lead to disability and sometimes finish the professional career of the patient for good. About ten per cent invalids are rendered disabled by joint diseases alone. Usually such kinds of arthritises affect people between the age of 30-40 and make them completely disabled for the rest of their life within three to four years. About one-tenth of them even cannot look after themselves.

In order to combat the diseases effectively, the USSR set up cardio-rheumatological service in 1958. It played not only an important role in reducing the primary disease rate but also made the relapses much less on the patients. As a result, the life expectancy of patients suffering from rheumatic valvular diseases has considerably gone up, which has now reached almost at the national average life expectancy level. Besides, it created an opportunity to

concentrate on the treatment of chronic disorders of the sustentacular and motion apparatus and on systemic disorders of the connective tissue.

Soviet pathophysiological Alexander Bogomolets created a theory of the connective tissue as a physiological system protecting the organism from the damaging impact of the environment. The skin—one of the forms of the connective tissue—forms a reliable barrier protecting the internal organs from infections. The spot of infectious agents' penetration into the organism is inflamed, and later this inflammation turns into fibrosis—scar.

Rheumatic diseases affect all the structure of the connective tissue. Macrophages and fibroblasts, or the main cell form capable of responding to damage, are the first to be affected. Macrophages are known as cells which devour infectious agents. Since their discovery by a Russian scientist Ilya Mechnikov, macrophages have been known as cells devouring infectious agents. Quite recently, it was established that macrophages, of all other factors, transfer information

on an "enemy's" intrusion to lymphocytes, or the main "hero" of the immunity system. It enables the organism to resist the infection.

Today, the problem of fibrosis formation, i.e., the replacement of the soft connective tissue by scarred, is especially topical. Majority of the rheumatic diseases is characterised by rapid development of fibrosis. In fact, all the inner and outlying joint tissues of connective tissue in all the organs are damaged accounts for various irreversible changes in the organism, i.e., inflammation of various joints, valvular diseases resulting from fibrosis, particularly sclerosis of the heart valves, as well as kidney and lung diseases.

Systemic scleroderma—a kind of natural model of sclerotic processes—is one of the most curious rheumatic disorders. This disease affects cells and fibroblasts producing collagen, especially those in the skin which is rich in them and in the connective tissues of various internal organs. They are involved in the process in cases of systemic scleroderma for which progressive fibrosis in those structures is very typical. The specialists of the institute of Rheumatology of the USSR Academy of Medical Sciences are studying the processes involved in collagen formation in the skin of systemic scleroderma patients. They have succeeded in finding out that the biosynthesis of collagen protein is very rapid even at the initial stages of the disease. As a result, fibroblasts produce a multitude of collagen fibres of different size and shape, which has been established through electron microscopy.

These changes are caused by the faulty synthesis and maturing of collagen proteins which lead to the appearance of great quantities of immature collagen. Remarkably, the ability of fibroblasts found in scleroderma patients to enhanced collagen synthesis turned out to be a stable symptom. Moreover, it also results in the generally increased activity of the cells producing various types of collagen and even an accumulation of proteins in tissues. At this stage, it is of paramount importance to find out the reasons for excessive collagen synthesis.

The research scholars have also studied the effect of catecholamines on fibroblasts in the tissue culture taken from systemic scleroderma patients. They have established that the contents of cyclic adenosine monophosphate (cAMP), one of the major biochemical regulators participating in molecular mechanisms of

hormone activity, is considerably lower in fibroblasts remarkable for their very high ability to synthesise collagen, and that the impact of their catecholamines on nucleotide synthesis in cells is much weaker. As cAMP inhibits collagen synthesis, its lower contents in the fibroblasts of systemic scleroderma patients leads to a more rapid collagen synthesis.

This means that the lower contents of cAMP and lower sensitivity to, say, catecholamines, are among the factors leading to excessive collagen production and development of fibrosis. Further research in this field will provide definite practical results, for they are to determine the damage that can be repaired by drug therapy. According to Valentina Nasonova, Director of the Institute, the development of fibrosis is typical of the entire group of inflammatory rheumatic diseases, but not to such a great extent as in cases of systemic scleroderma.

The development of the genetic foundations of rheumatic diseases have made it possible for the researchers to come close to understand the nature of its hereditary predisposition, to establish the risk factors and provide a theoretical description of those groups of population which are threatened with inflammatory and degenerative diseases. The scientists used an overall approach comprising of various genetic technique—from clinical and genealogical ones to mathematical models.

The Polygene models, helped them establish the quotient of hereditary predisposition to rheumatism, which amounted to 60 to 80 per cent, or to 55-56 per cent in cases of rheumatoid arthritis. The first on the scale of hereditary predisposition to rheumatism are patients suffering from rheumatic mitral stenosis, followed by cases of combined mitral and aortic stenoses and those of mitral incompetence. The next category is of patients who have had rheumatic fever not accompanied by a valvular disease.

The above mentioned studies cover only some of the fundamental problems arising in rheumatic cases. However, the study of genetic factors is important for two reasons: First, it makes possible for physicians to identify people likely to contract the disease and find means of protecting them. Secondly, this research will enable the scientists to prevent grave, irreversible changes in cases where the disease is contracted. △

The need for some salt for human beings has been established but the necessary quantity is in doubt. In any case it is quite obvious that the body gets all the salt it needs from natural foods, otherwise many isolated cultures all over the world who know nothing of the existence of salt could not have survived.

LET'S TALK ABOUT SALT

SMT. ARUNA PALTA

MAN'S love for salt is due to habit and a long tradition. Human beings have been consuming salt since five to ten thousand years, so the habit has been pretty well ingrained. Historical records also reveal that salt was always of great importance as wars have been fought over its sources and for centuries its trade was more important than that of any other material, even more than precious jewels and metals. Men were often paid in the form of salt for the work they performed in early times.

Since the beginning of Medical Practice, man's need for salt has been a subject of dispute. Dr Desnoo reminds us that civilized man has been using salt for centuries, because food tastes better with salt, rather than because his body needs it. As man became aware of the physiology of human body, it was suspected that effect of salt on body was disastrous. Since then researches have been carried out to see the effect of salt on body.

Normal intake

The chemical name for the common salt is sodium chloride. The normal intake of sodium chloride by people may range from 2 to 20 gms daily depending upon individual taste. There is some natural salt in just every food we eat, which is enough to meet the needs of the normal body. Dr Lehmann found that most animals in freedom and in captivity do very well on natural foods without the addition of any salt. R. Ackerly states that the body requires only 2-3 gms of salt a day. German scientist G. Von Bunge made the guess that extra salt is necessary to those civilizations which depend upon agricultural products for much of their diet. Dr Dahl suggests a maximum salt intake of about 5 gm. per day for an adult without a family history of high Blood-Pressure. In the presence of existing blood pressure the amount of salt should be reduced below 1 to 2 gms.

Common salt or sodium chloride contains 39% of sodium. Sodium element never occurs in free form in nature. It is found in associated form with many minerals especially in plentiful amounts with chlorine. Sodium chloride when dissolved in water yields sodium and chlorine ions. Both are important for chemical processes in our body. Practically all the sodium in the body is found in the extracellular fluids. Sodium ions make up 93% of the basic ions in the blood. Sodium plays an important role in the regulation of the acid-base balance in the body fluids including blood, lymph, cerebrospinal fluid, urine, tears and gastrointestinal secretions. It also determines to a large degree the osmotic pressure of the extracellular fluids. It also takes part in the maintenance of muscular contraction and normal nerve irritability. Chloride is very closely associated with sodium in the extracellular fluids. It is taken in the body largely as sodium chloride and its excretion in urine, sweat and gastrointestinal tract usually follows the excretion of sodium. In addition chloride is found in the gastric juice as a component of the hydrochloric acid molecule and in salivary amylase the chloride ion activates the starch splitting enzyme of saliva.

Both excess and deficiency of salt may produce bad effects on human body. This has been experienced in different pathological conditions.

Salt Excess

The sodium in the salt has been condemned many times as a contributing factor in cardiovascular and renal diseases as well as for other physical problems:

- (i) Excess salt causes hyperacidity as the chloride part of salt takes part in the formulation of hydrochloric acid. Hyperacidity is further responsible for the production of ulcers.

- (ii) Dr Allen Frederick conducted experiments and found that when animals were fed a high salt diet, blood-pressure increased. Salt intake is usually restricted in hypertension as it causes greater retention of fluid in blood stream contributing to higher total blood volume. Some of the fluid may seep out in the tissues causing swelling.
- (iii) In congestive heart diseases when a low salt diet was given it produced beneficial effect. Some people with damaged hearts have difficulty in eliminating the excess fluid from their bodies. Swelling occurs in different parts of the body which is one of the signs of a failing heart. The excess fluid adds as extra burden to the heart which is already weakened.
- (iv) Salt irritates the soft and delicate membranes of our body. Dr Henry C. Sherman have stated that "through over stimulating the digestive tract salt may interfere with the absorption and utilisation of the food".
- (v) In later stage of pregnancy salt free diets show good results. Swelling and blood pressure due to pregnancy is reduced and also the length of labour and severity of pain is diminished.
- (vi) In natural food items sodium chloride is present in small quantities. So the function of the kidney is to reabsorb the sodium chloride which is present in the glomerular filtrate. Excess salt interferes with the body's power of excretion. The kidneys have to work harder to excrete the excessive amount of salt. In 24 hours about 180 litres of glomerular filtrate is obtained which contains 552 gms. of sodium. This is about 8 times of the total body sodium content and 250 times of the average daily intake. In order to maintain the balance about 99.5 per cent of the filtered sodium and chloride is reabsorbed. In kidney diseases either due to reduced glomerular filtration rate or diminished tubular reabsorption or due to therapeutic doses of cortisone or other adrenal cortical hormones, sodium excretion is reduced and oedema may result.
- (vii) An excess accumulation of fluid in the abdominal cavity is known as ascites. It is sometimes referred to as abdominal dropsy or hydro-

peritoneum. It is often found with the cirrhosis of liver. Restriction of dietary sodium has a salutary effect on the generalized oedema and on the accumulation of ascitic fluid. Low sodium diet also serves as a prophylaxis against future resumption of fluid collection.

Thus salt has been found to be a causative and aggravating factor in many pathological conditions. Sodium restricted diets not only help in the management of cardiovascular disorders but also serve in the management of Renal diseases with oedema, cirrhosis of the liver with ascites toxæmias of pregnancy and when treatment with adrenocorticotrophic hormone, cortisone or other similar steroid hormone is done.

Low sodium diet

Jolliffe and Tisdal have stated that good health can be maintained on as little as one gm. of salt per day. Some people take as much as 20 gms per day. It is just as if a doctor had prescribed a drug and people take about 20 times of it.

Salt restriction is beneficial in the all above described conditions. The American Heart Association has published 3 booklets describing exchange lists for different levels of sodium restriction.

(1) *Your Mild Sodium Restricted Diet (2 to 3 gm Sodium) :*

Light salting of food such as is done in canning is permitted. Brined foods and those prepared with mono-sodium glutamate is omitted. The patient adjusts quite readily because the food is palatable.

(2) *Your Moderate Sodium Restricted Diet (1 gm. Sodium diet):*

The quantity of milk, meat and bakery products is restricted. Some vegetables are omitted. No table salt is added during cooking.

(3) *Your Strict Sodium Restricted Diet (500 Miligram Sodium diet):*

Many foods are too high in natural sodium to be allowed on this diet. It often is not well accepted by the patient. The strict sodium restriction is used for congestive heart failure and occasionally in sclerosis with ascites or renal disease with oedema. Low

sodium dialyzed milk is used. All convenience and canned foods have had sodium added. Foods containing sodium-bicarbonate, mono sodium glutamate, baking powder, sodium benzoate, sodium citrate or sodium acetate should be restricted.

The Institute of Human Nutrition Columbia University had prepared a list of foods which contain insignificant amount of sodium and which are permitted for all diets.

FOODS WITH INSIGNIFICANT AMOUNTS OF SODIUM*

- Grains** — Wheat, Oat, Rice, Barley & their products
- Fruits** — All fresh & canned fruits and their juices
- Vegetables** — All except Artichokes, Beet, Carrot, Celery, Mustard-leaves, Turnip and spinach. Canned or frozen salt free vegetables permitted.
- Meats** — All fresh, frozen or canned without salt, beef, lamb, pork, veal, poultry fish, shell-fish and game meats.
- Eggs** — All fresh.
- Fats** — All vegetable oils and shortening, lard and unsalted butter and margarine.
- Condiments** — Vinegar, all spices, mustard, flavourings that do not contain salt.
- Sweeteners** — Sugar, honey, syrup, jellies, molasses.
- Beverages** — Alcoholic beverages, coffee, tea, soft drinks.

*Permitted for all diets.

From Institute of Human Nutrition. Columbia University, Nutrition & Health, 1:3, 1979.

Some people find it difficult to adjust with a salt free or low sodium diet. For them cooking foods with unusual herbs and spices may create new flavour and will make the person forget that he ever used salt. Such spices and herbs are: all spice, caraway, chillipowder, coconut, ginger, lemon juice, saffron, peppermint, mustard seeds, dried mango powder, etc. Besides, unrefined sea salt can be used instead of common salt as it contains less sodium chloride. It is also rich in other trace elements such as iron, iodine, copper, cobalt, calcium which we are not likely to get from common salt. Increasing the potassium content of the diet may help in neutraliz-

ing the bad effect of sodium to some extent in body. Foods high in potassium are fruits, vegetables, nuts and sea foods. "Salt substitutes should not be used without the physician's permission because some of them contain sodium which are harmful if there is the complication of kidney insufficiency. Some of the substitutes contain ammonium which is harmful to the patient with liver disease.

Salt Depletion

In tropics where people sweat excessively, they may sometimes suffer from salt depletion. Salt depletion may also follow sometimes after extensive blood loss, recurrent vomiting, protracted diarrhoea, burns, adrenal cortical insufficiency chronic renal disease and after prolonged use of diuretics. Sodium depletion symptoms include weakness, lethargy, headache, anorexia, muscular weakness, abdominal cramps and in severe cases may result in mental confusion.

Normal individuals have no danger of salt depletion because more than enough salt is provided by the usual diet even without added cooking or table salt. Sodium is also present in softened drinking water, in a number of condiments and spices and flavour enhancers. Sometimes athletes and outdoor workers may sweat profusely in hot weather resulting into sodium depletion. Salt tablets can be given to maintain salt balance in their systems. In sodium deficiency states the adaptation of body is maximum as all the sodium reaching the glomerular filtrate is reabsorbed and no sodium chloride can be detected in urine. A very simple test of adding silver nitrate to urine can be performed for detecting the primary salt deficiency. If sodium is present in urine a white precipitate of sodium nitrate is obtained. Absence of precipitate indicates sodium deficiency.

Conclusion

Purley vegetarian diet contains less salt than non-vegetarian foods as fruits and vegetables do not contain as much natural sodium as the animal products. So people consuming non-vegetarian foods do not require salting their foods with either cooking or table salt. This can be done gradually by using less and less salt in cooking. It would be wrong to say that the body does not use any salt taken along with foods. The need for some salt for human has been established but the necessary quantity is in doubt. In any case it is quite obvious that the body gets all the salt it needs from natural foods, otherwise many isolated cultures all over the world who know nothing of the existence of salt could not have survived.

If added salt is avoided from foods we eat, we would be surprised to see that how different and how better the food tastes without added salt. We would also realize that we have never really tasted food before, because what we had been tasting was the salt of food. With a diet having no added salt will result into an increased health and good flavour of natural foods which will be our reward. △

EXERCISE AND CARDIOVASCULAR FITNESS

YOUR heart, like any other muscle in your body, gets stronger with regular exercise. The right kind of exercise increases cardiovascular fitness by improving blood circulation throughout your body and allows you to exercise vigorously for long periods of time without tiring.

Exercise that promotes cardiovascular fitness improves your body's circulation so that your heart, lungs and other organs work together more efficiently. Cardiovascular fitness also may give a person the ability to meet physical and emotional demands more readily.

It may help reduce the risk of heart disease. A strong heart does not have to work as hard to circulate the blood through the body because it can pump more efficiently with each beat. It is impossible to prove you will live longer or never have a heart attack if you are in good physical condition, but cardiovascular fitness helps you feel better and can improve the quality of your life.

What type of exercise is good for your heart?

Dynamic (also called aerobic) exercises challenge the heart and circulatory system to meet extra oxygen needs. They are endurance or high energy activities that require large muscle groups to work in rhythmic motion. Examples of dynamic exercises include jogging, swimming, bicycling, jumping rope, and even fast walking. You can tell if these activities are increasing your body's demands for oxygen by taking your pulse before and after the exercise.

A few sports such as tennis, squash, basketball, football and hockey can be considered dynamic exercises if they are played vigorously at least three times a week.

Static exercise like weight lifting does little to promote cardiovascular fitness. It may help build muscle strength, but not help improve your cardiovascular system, supplement it with dynamic exercise.

How to choose an exercise programme?

Once you have made the decision to exercise regularly there are a few factors to consider when choosing an exercise programme. Your health and physical capability are some of the most important considerations when deciding on an exercise programme. Choose a sport in which you have some skill and ability. Also, choose an exercise activity you really enjoy. By concentrating on one activity, you will improve your skill and endurance more rapidly, and it will be easier for you to chart your progress.

Choose an exercise activity that is convenient for you. Your exercise programme will not continue long if it is difficult to accomplish. Individual sports such as jogging and swimming are obviously more convenient activities than sports that require other players, or special courts or facilities.

One of the most important factors in beginning an exercise programme is to determine the most convenient time for you to exercise. It is also important to follow a regular schedule so that exercise becomes a habit.

— *Heart News*
March 1985

(contd. from page 165)

Disease in vein grafts

With increasing reoperations it was becoming apparent that while some vein grafts remain patent for several years, others develop atherosclerosis and blockage. In other words, "you can see all the changes in a vein graft that you see in atherosclerotic disease". Therefore the grafts themselves often pose a problem, requiring reoperation.

In the Houston series, reoperation was necessitated mainly by graft occlusion, by the natural progression of the disease in the bypassed arteries and less often by technical errors and incomplete revascularisation.

Although a second operation prolongs life, because of the development of end stage coronary disease in some, it does not do so dramatically. Dr Reul added.

Balloon angioplasty

Percutaneous transluminal coronary angioplasty (PTCA) or balloon angioplasty is being carried out with increasing frequency for the treatment of single and even multiple-vessel disease. Despite its pronounced value, PTCA, with an initial failure rate of 30%, has improved to be 92% successful. However, it provides only temporary relief until a bypass can be performed, Dr Reul stated.

PTCA also requires a surgical team on stand by, to carry out emergency bypass in high risk patients, especially those with ongoing myocardial infarction.

Dr Reul also referred to laser technology as an exciting future method of treating coronary artery disease, by "blasting away" atherosclerotic plaques either through direct vision or an angioscope intra-operatively. Laboratory testing had reached a promising stage.

Summing up, Dr Reul described the status of coronary artery surgery 1984 as:

- Operative mortality—1%
- Use of post-operative intra-aortic balloon pump—1%
- Peri-operative infarction—2%
- Later reoperation—2-6%
- Attrition rate—1-2% a year
- Myocardial infarction—1% a year.

"This is really quite a change from 15 years ago when we first started and to-day there is no question that coronary bypass improves both quality and length of life", he declared.

Courtesy : *Sandoz Medical Times*
December 198



A YEAR FOR THE YOUTH

YOUTH, the longest moment in life, is the time to dream. But, as things are, few among the youth can afford to dream, for so overwhelming are the harsh realities and hostile environs they face. If today's world is yesterday's dream, let them get a chance to dream for the future of mankind.

The year 1985 has been dedicated to discussions, debates and indepth studies on the problems of youth so that in the years to come, they may fare better and may even dream.

Visible and "invisible" at the same time, youth permeate developing nation's economies. In households, farms, factories and elsewhere, work is one of the responsibilities of youth and they are taking an

increasing share of the work. Young people throughout the world, in the developing world particularly, constitute an important part of the labour force.

Where labour-intensive production characterises all economic sectors, teenagers and young adults are a major source of labour. They are working now; they will be working more in future.

Yet, youth in the developing world faces high unemployment, low standards of living and wide disparities in wealth and opportunities, because the economic contributions of youth tend to be 'invisible' and hence uncounted, unvalued, unplanned and unacknowledged. It makes effective and efficient integration of their effort into economic development diffi-

cult. Development programmes and policies integrated with the specific needs and conditions of the youth are few indeed.

Who are the Young ?

In the developing world, some 70 crore people (20 per cent) are between the ages of 15 and 24 and some 140 crores are under 15. Against this in developed countries, the percentage of under 15 is very low and it is shrinking fast. Accepted international definition of 'youth' is persons aged 15-24; in practice it is anywhere between 10-30. Some are forced out of the family umbrella at the age of 10, while some continue to be totally dependent on their families even at the age of 30.

Development process neglects youth mostly because they have no proper knowledge of what they are doing, of their capabilities and of the impact of development on them. Moreover, as younger children are born, the older ones usually are ignored.

The kind of work youth is engaged in is conducive to its neglect in the development process, because they are most often found in unskilled or low paid jobs and they are easily replaceable. Their work is intermittent in casual or secondary labour markets and at unstructured worksites. Only when there is gross abuse and exploitation, child protection issues arise.

Even though it is assumed that those under 15 are at school, the reality is quite different. And as it is taken for granted that they are all at school, their labour is not looked upon as an economic resource. In spite of the spread of basic education, not all rural children, particularly girls, attend school at primary or secondary level. "Complete" school is far lesser. Improvement in education and training is a must for increase in productivity and quality of the workforce. Efforts are afoot to coordinate school schedules with work schedules, to initiate appropriate curriculae, to bring fees and uniforms within universal reach and to make training relevant to the existing labour markets. Linking health and nutrition with education and training is also receiving world-wide attention.

Since young persons appear to be an abundant resource, they may be perceived to be without economic value. But when they are unemployed under-employed or uneducated, it leads to substantial loss of human

resources. Only a sustained, systematic and organised effort can make them a really visible force in the development process.

Women and Children

Women and children account for upto 80 per cent of the developing world's population. As women are, so are the children. If women are educated they have fewer children. If women are healthy, they produce healthy children. If women value female children as much as they value male children, there will be more equity. As far as the problems faced by women and youth in being integrated into the development process, they too are the same. Their work on the farm or off-farm, seasonal or full time needs to be duly taken into account by development planners. Better data and clearer definition of the roles of both are also required. It must not be forgotten that women often work with their children in the factory in home production and on the market. Children are economic assets, in some cases as early as at the age of three and hence the case for large families in most developing countries. A development framework that embraces women and youth in farm family and in the labour market is urgently called for.

Suggestions for the Year

Incorporation of the concerns of women and youth into development efforts calls for the formulation of a new corps of committed scholars and practitioners. Another requirement is an accurate and expanding information base which includes their economic roles differentiated by their sex, age, area, family status, income, education, etc. Development impact on youth and women such as happens when young persons free their parents to go to the market to sell produce and the result of obtained education on youth in relation to present and future productivity have to be extensively studied. Projects and policies which deal directly with the productive potential of women and youth have to be formulated urgently. Training of techniques dovetailed to the available resource mix, emphasising human oriented technologies instead of mere labour-saving devices should be made available to the managers. Teaching should incorporate youth and women and "Youth in Development" could become a part of the sub-discipline "Women in Development".

The year 1985, as the International Year of the Youth and the end of the UN Decade for Women, is an appropriate time to merge the overwhelming common interests of women and youth.

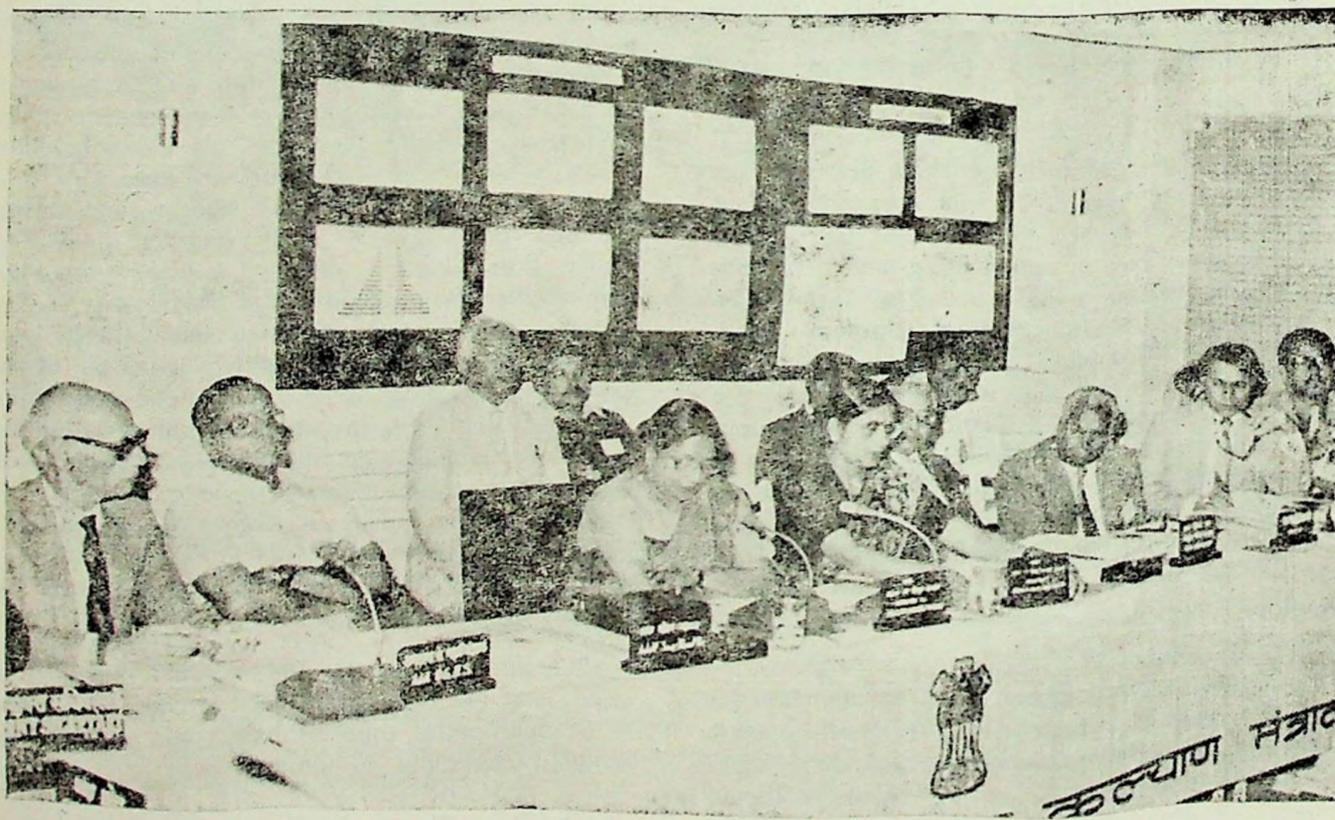
—P.I.B.

New Hospitals for Heart Diseases

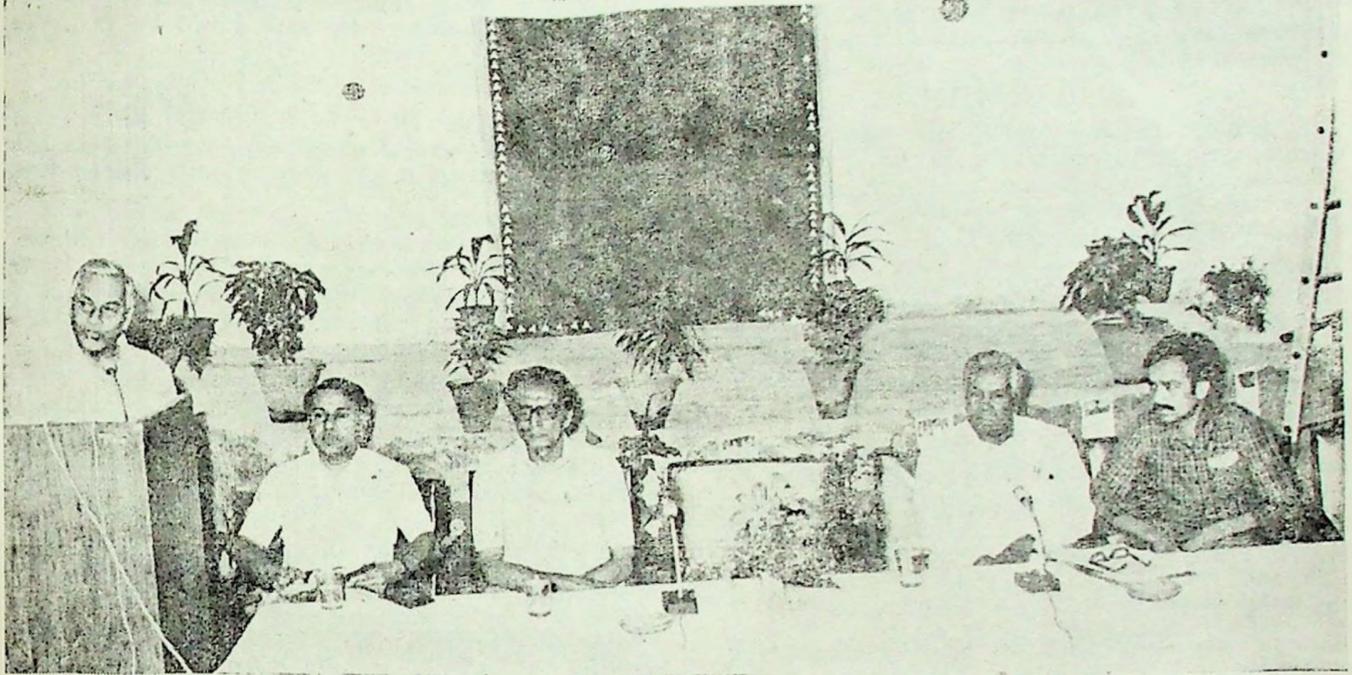
The following hospitals in the country have facilities for advanced cardio-thoracic surgery for treating certain complicated heart diseases :

- (i) Southern Railways Hospital, perambur, Madras.
 - (ii) Christian Medical College and Hospital, Vellore.
 - (iii) K.E.M. Hospital, Bombay.
 - (iv) All India Institute of Medical Sciences, New Delhi.
 - (v) Bombay Hospital, Bombay.
 - (vi) G.B. Pant Hospital, Delhi.
 - (vii) Sree Chitra Tirunal Institute of Medical Sciences and Technology, Trivandrum.
 - (viii) Post Graduate Institute, Chandigarh.
 - (ix) S.S.K.M. Hospital, Calcutta.
 - (x) Samaritan Hospital, Alwaye (Kerala).
 - (xi) Kasturba Hospital, Bhopal (BHEL).
 - (xii) N.M. Wardia Institute of Cardiology, Pune; and
 - (xiii) Apollo Hospital, Madras.
- (Information given in Rajya Sabha by Shri Yogendra Makwana, Minister of State for Health and Family Welfare, on 27th March, 1985.)

Smt. Mohsina Kidwai, Union Minister of Health and Family Welfare, inaugurated a two-day Conference on 'Strengthening of State Health Education Bureaux' in New Delhi on 4 March, 1985. The conference was organised by the Central Health Education Bureau. Sitting on the dais from left to right are : Dr M. D. Saigal, Addl. Director General of Health Services; Shri P.K. Umashankar, Addl. Secretary, Health; Smt. Mohsina Kidwai, Union Minister of Health and Family Welfare; Smt. Serla Grewal, Secretary Health and Family Welfare; Shri R.P. Kapoor, Addl. Secretary and Commissioner, Family Welfare; Dr Mahendra Dutta, Deputy Director General (P); Dr H.C. Agarwal, Director, CHEB; and Dr Imam S. Mochny, Health Education Specialist (Family Welfare), W.H.O. (For report please see Swasth Hind June 1985 issue).



INTERNATIONAL YOUTH YEAR
WORLD HEALTH DAY-HEALTHY YOUTH-OUR BEST RESOURCE
10th APRIL-1985



Observance of World Health Day—1985

WORLD Health Day, 1985, was observed by the Central Health Education Bureau at the School of Social Sciences Auditorium, J.N. University, New Delhi, on 10 April, 1985. Prof. P.N. Srivastava, Vice-Chancellor of J.N. University was the Chief Guest.

Addressing the meeting, Prof. Srivastava said that if Health for All was to be achieved by 2000 A.D., drinking water and sanitation had to be taken care of on priority basis. Both the community and the individual had to share great responsibility for looking after their health. Elaborating about the problem of safe water supply and sanitation he dealt with the role of National and International Organizations. Emphasizing the role of Radio/T.V. for the achievement of the goal of health for all, Prof. Srivastava said that programmes on health could be incorporated in the programmes directed towards rural audience such as "Krishi Darshan" etc. He said that the educated youth should do whatever they could in spreading the message of healthful living which would supplement Government efforts.

The keynote address was delivered by Dr Mahendra Dutta, Deputy Director General of Health Services. He mentioned about the comprehensive plan

drawn out by the Government of India to mobilize the youth power for the national development and promote activities involving the youth in the country. He added that involvement of youth in health and welfare activities was essential if we were to make any headway towards a better and bright future and also for achieving the goal of health for all by the year 2000 A.D.

The meeting was also addressed by Dr H.S. Hassan, Regional Advisor (Health Education), SEARO, W.H.O. and the President of the Students' Union, J.N. University, New Delhi.

Earlier welcoming the Chief Guest, Dr H.C. Agarwal, Director, CHEB, mentioned about the relevance of the theme of the World Health Day at this juncture when India is entering into a new era of progress and change. He also mentioned that the theme is an integral part of the International Youth Year with its emphasis on participation, development and peace.

Prof. P.N. Srivastava, Vice-Chancellor of J.N. University also inaugurated the exhibition on the theme "Healthy Youth-Our Best Resource" organized and set up by the Central Health Education Bureau on the occasion.

Major Advance in Thyroid Research

JOHN NEWELL

DOCTORS at the Welsh National School of Medicine in Cardiff, the capital of Wales, have achieved dramatically successful results with a new, so far experimental, approach to the treatment of thyroid disease.

The technique, developed by Alan McGregor and his team, may prove valuable in the future treatment of the muscle wasting disease myasthenia gravis, the kidney disease Goodpastures syndrome, and the inherited blood disorder haemophilia.

Auto-immune thyroid disease is common in most parts of the world, especially in women aged over 40, of whom up to one in 20 may be affected at some time in their lives. The particular form of the condition Dr McGregor and his colleagues are working on is called Hashimoto's thyroiditis.

It is caused by white cells, B-lymphocytes, which normally defend the body against disease by identifying and attacking foreign organisms, mistaking part of their own body's thyroid gland for foreign tissue and attacking it, with harmful consequences.

Eliminating Cells

Only a small proportion of the B-lymphocytes in the bloodstream take part in this auto-immune reaction, as it is called. If just these cells could be eliminated from the bloodstream, the condition would be cured.

This is the approach followed by Dr McGregor's team. They first purified the particular component of thyroid gland tissue, an antigen, to which the auto-immune reaction is directed. This antigen was extracted from thyroid tissue removed surgically from patients.

Molecules of it were then joined chemically to those of a deadly toxin, ricin, one molecule of which is sufficient to kill any cell it enters. This conjugate was then mixed with blood samples from sufferers of Hashimoto's thyroiditis.

Dr McGregor found that the B-lymphocytes in the blood sample responsible for the harmful auto-im-

mune response reacted with the conjugated antigen, mistaking it for thyroid gland tissue. As the B cells engulfed the antigen, they were killed by the ricin.

Trials in rats

No other white cells were affected because the ricin used had been treated chemically to make it deadly only at very short range, when actually absorbed by living cells.

Following good results in human blood samples, trials of the technique in rats are now going on at Cardiff. Dr McGregor is using animals in which a condition imitating human auto-immune thyroid disease has been induced.

One major problem to be overcome before the technique can be used in human is that of finding a way to ensure the conjugate of antigen and ricin stays in the bloodstream for long enough to do its job of eliminating all the harmful clone of B-lymphocytes.

Techniques for delaying the natural process in which foreign matter, including the conjugates, would normally be cleared out of the bloodstream are being developed at Cardiff. And extensive safety tests would also be needed before a toxin as potent as ricin could be passed for use against a non-life threatening condition such as auto-immune thyroid disease.

Treatment for other ailments

Dr McGregor sees the work on thyroid disease as important largely as a model for treating more serious, life threatening conditions such as myasthenia gravis. In that, the antigen targeted for the harmful auto-immune reaction is known, and could easily be obtained in quantity to be conjugated to ricin and used in treatment.

If all goes well, what has been nicknamed the "poisoned bait" technique may become a reality in perhaps ten or 15 years for dealing with some of the body's highly dangerous auto-immune reactions affecting the blood and kidneys. △

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BOOKS

Treatment and prevention of acute diarrhoea: Guidelines for the trainers of health workers. Geneva, World Health Organization, 1984. ISBN 92 4 154200 4. v + 35 pages. Price: Sw. fr. 8.-. Arabic, French and Spanish editions in preparation. Available from the South East Asia Regional Office, W.H.O., World Health House, I.P. Estate, New Delhi-110002.

PROMPT and appropriate treatment of diarrhoea, particularly in infants and children, can prevent undernutrition and save life. In the early stages of the disease, the most appropriate treatment is administration of oral rehydration solution, which is a simple and effective means of restoring the water and salts lost from the body in diarrhoea. Community health workers should be made aware of this method of treatment and encouraged to use it.

This book is intended primarily for the trainers of such middle-level health workers, to help them present the topic in training courses. It gives guidelines on both the treatment and prevention of diarrhoea, with particular emphasis on the use of oral rehydration in children. It describes, in simple terms, the importance of preventing dehydration in a child with diarrhoea, and gives instructions for making rehydration solution, using either packets of oral rehydration salts or locally available materials. Easy-to-follow charts summarize the management of diarrhoea and indicate the signs and symptoms that the health worker should look for in assessing the patient and determining treatment. The importance of good domestic hygiene and appropriate child-care practices in preventing diarrhoea is stressed, and the role of the health worker in educating the community is given particular attention. 4

The uses of epidemiology in the study of the elderly. Report of a WHO Scientific Group on the Epidemiology of Aging. World Health Organization Technical Report Series, No. 706, 1984. ISBN 92 4 120706 X. 84 pages. Price: Sw. fr. 8.-. Arabic, French and Spanish editions in preparation. Available from the South East Asia Regional Office, W.H.O., World Health House, I.P. Estate, New Delhi-110002.

SINCE time immemorial, some people have lived to a ripe old age, but they have formed only a very small proportion of the population. During the past few decades, however, the decline in birth rates and in infant mortality, the control of communicable diseases, and improvements in nutrition and living standards have resulted in an increased life expectancy.

In this report the WHO Scientific Group reviews the information available concerning the age structure of populations in countries at different stages of the "epidemiological transition", and discusses the implications for health services of the changing patterns of morbidity and disability among those over 65 years of age. The Scientific Group recognized that the health and autonomy of this age group are affected by many interwoven aspects of the social and physical environ-

Authors of the Month

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BBC, London.

ment—including lifestyle, marital status, family sup-availability of health services—and went on to con-availability of health services—and went on to consider the possibility of measuring degrees of health, autonomy, and disability. Such indicators would have to be clearly defined, readily assessed, universally applicable, and of practical use in recognizing groups at risk and in planning for and evaluating the efficacy and effectiveness of services. The actual problems of making assessments of health status in elderly populations are discussed in a separate chapter and guidelines for surveys are given in a useful annex.

The Scientific Group made a number of proposals for research and concerning ways of developing the application of epidemiology to the wellbeing of the elderly. These concerned specifically the need for an information clearing-house, studies of the epidemiological transition, the definition and measurement of autonomy, applications of health systems research, the study of patterns of aging of populations, and ways of increasing public awareness of the consequences of the aging of populations and of the possibilities of coping with the problems that arise.

The number of old people in the world is expected to increase by more than 100 million before the year 2000 and nearly three-quarters of these will live in developing countries. This report will undoubtedly be of interest to all of those who should now be making plans to cater for their needs.

swasth hind

SPECIAL NUMBERS 1984

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