



EXERCISE and HEART DISEASE

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THE value of exercise in the prevention and treatment of organic heart disease has been increasingly emphasized in recent years. The clinical observations of Dr. Paul D. White, the epidemiologic studies of Dr. J. N. Morris, and the biochemical findings of Dr. G. V. Mann and Dr. W. Rabb all lend some support to the view that exercise may be helpful to the cardiovascular system. The present evidence would lead one to think that regular systematic physical exercise tends to decrease the level of blood cholesterol and also to diminish the likelihood of or to delay the development of atherosclerosis (hardening of the arteries). It would follow, then, that the lack of physical exercise, the indolent life being led by modern man in the more industrialized nations, the numerous laborsaving devices that enable us to accomplish a lot with little physical effort are greatly responsible for the mounting number of "heart attacks" and "strokes" that are crippling and killing our citizenry.

These are very important and sobering considerations and deserve our most serious attention and scrutiny. For, at present, heart disease and its allied circulatory conditions are the greatest public health problem and account for more than 50 percent of all deaths that occur in this country.

Although there are considerable indirect data indicating that exercise is beneficial to the circulation, conclusive proof is still lacking. If we assume that exercise is of value in regard to the treatment of coronary atherosclerosis, what other

factors need investigation in appraising the total problem of heart disease and the broader problem of useful living? The significance of recent studies on the effects of exercise have to some extent been misinterpreted and misapplied.

Coronary artery disease generally manifests itself in one of two forms. In one there is a peculiar kind of transient pain or distress in the chest (angina pectoris). The second is a coronary thrombosis or a myocardial infarct (the common serious "heart attack"). In the former there is a temporary inadequacy of blood flow and nourishment to a certain part of the heart muscle, possibly due to a spasm of a few minutes' duration; but the heart muscle suffers no permanent structural damage. In the latter, a blood vessel within the heart muscle itself is clogged, partially or completely, with resultant damage to a portion of the heart muscle, because of lack of nourishment. This type of injury is called an "infarct" and may even come from prolonged inadequacy of blood flow when the vessel is not clogged.

The above two conditions, for the most part, develop because the coronary arteries have already become hardened or narrowed. They occur only rarely in individuals who have previously had normal, smooth blood vessels. In fact, the sclerotic process in the arteries is generally present for a long time, possibly many years, before the patient or the physician knows that anything is wrong. In a word, most coronary patients have disease of the coronary arteries for years, while they feel

Drawing by Albrecht Diere.

and carry on as well as ever, before any manifestation of ill health is apparent. It is admitted by the best of physicians that in a fair number of individuals who suffer a coronary attack, nothing abnormal in the heart can be detected during the days before the attack, even by experts. Such patients have symptomless or silent coronary disease, undetectable on careful examination.

Exercise may have a beneficial effect in this early symptomless stage of coronary disease. It is thought that physical exercise may delay the attack, decrease its extent, or prepare the heart to meet the coming coronary thrombosis better by increasing the caliber or the number of new or collateral arteries within the heart. It is obvious that when one vessel suddenly becomes blocked the heart will do better if a large number of detours have been prepared to carry blood to the muscle that has been deprived of its nourishment. However, exercise is not regarded as a preventive but rather a retarder of coronary sclerosis. Despite this protection, there are still a large number of individuals who carry on regular physical exercise and maintain an excellent state of physical fitness and yet suffer heart attacks.

Although exercise may delay or attenuate the sclerotic process, I believe physical effort can be harmful once the sclerotic process has developed. We must realize that a man may have felt well and been regarded as well by his physician a day or two before a heart attack because he had silent, undetectable coronary disease. During the silent period a sudden strenuous effort, such as running after a streetcar, lifting a hundred-pound case, shoveling snow vigorously, or any severe unaccustomed physical effort, can precipitate a heart attack, can cause collapse or even sudden death. The large number of deaths occurring among men over fifty years of age during or directly after shoveling snow attests to the fact that strenuous physical effort is a hazard to some people. How well each one of us recalls reading in the morning newspaper, after a heavy snowstorm, the distressing list of men who succumbed after shoveling snow. To be sure, nothing harmful would have occurred if the hearts in these individuals had been perfectly normal, but they did not know, nor could their physicians have known, that they had vulnerable coronary arteries until after the attacks occurred.

In other words, unaccustomed, strenuous physical exercise can be dangerous for some individuals. It certainly can be harmful to those who already are known to have coronary disease. Inasmuch as men over the age of fifty frequently have silent coronary disease and are therefore vulnerable, they also should regard unusual physical strain, such as shoveling snow, as something not to be

undertaken lightly. However, even intelligent people will perform certain tasks knowing there is some risk involved. This is a daily experience for many of us. The pros and cons are weighed, and a final decision is made. This applies to flights in airplanes or driving a motorcar as well as shoveling snow. The point is that for persons over the age of fifty there is a hazard in performing unaccustomed strenuous physical activities which is best avoided whenever possible.

IT HAS often been claimed that heart attacks are not related to effort because they occur as frequently when a person is at rest as during exercise. These attacks do occur as often when the individual is at rest as when he is ambulatory. If as many attacks occur during the eight hours we are in bed as during the eight hours we are active, it has been concluded, physical effort has little or nothing to do with precipitating an attack.

There is a vital error in this calculation. It is not claimed that ordinary activities, to which the individual is accustomed and which he always has performed with comfort, are hazardous. It is the more sudden and more violent and more strenuous efforts that can do damage. If a man rows a boat vigorously in order to reach shore because he is caught in a storm, and immediately afterward has a heart attack, one might still think the two circumstances are coincidental. If two such experiences occur, it hardly needs any further statistical evidence to make clear that the violent exercise caused the attack. In order to make a valid comparative analysis between the role of rest and violent or unaccustomed exercise, one would have to make quite a different calculation. If 1000 men between the ages of sixty and seventy, sleeping eight hours a night, had ten heart attacks, and another 1000 men of similar age shoveled snow for one hour and had ten heart attacks during that hour, shoveling snow would be eight times as dangerous as sleeping in bed. For those at rest, one attack occurred every 800 hours of sleep, while for those shoveling snow, one attack occurred every 100 hours. When strenuous effort is thought to be related to a heart attack, the cause and effect sequence is immediate and intimate.

The same intimate relationship exists between heart attacks and a sudden severe emotional upset. Occasionally a person is suddenly frightened or hears distressing news and drops dead. Such events occur too frequently to be anything but cause and effect. This type of death is much more likely to be due to sudden inception of a new rhythm of the heart, called "ventricular

fibrillation," than to a new blocking of a coronary artery. When this new rhythm develops, the heart stops contracting, and death results. A woman learned that her brother died suddenly. She promptly made a hurried trip to her brother's home and, on seeing his body, dropped dead. Although such experiences are not commonplace, it is difficult to regard them as purely coincidental. This, of course, has no direct bearing on the problem of rest and exercise. It does mean that certain vulnerable individuals are subject to unpredictable disasters from sudden emotional upsets as well as from unaccustomed severe physical effort.

THERE is another aspect of heart disease and physical exercise that is poorly understood by the lay public and is just as important as the coronary problem. This concerns individuals who have heart disease that entails the threat of congestive failure. In these people breathlessness, swelling of the legs and abdomen, cough, and weakness are the main complaints. Such patients have valvular disease, high blood pressure, congenital heart disease, or some form of heart muscle deterioration. They do not necessarily have pain in the chest, though many do have coronary artery sclerosis.

In such circumstances there is no satisfactory evidence whatever that exercise has any beneficial effect. In fact, everything points to the reverse. The cardinal principle in the treatment of such cases is rest. The drugs that are employed serve to strengthen the contracting power of the heart and to slow the heart rate so that it may have a greater resting period. All measures are employed to diminish the work of the heart and to decrease the demands of the body.

Whenever congestive failure has occurred, or when it is a possible threat, exercise can precipitate sudden suffocation (so-called acute pulmonary edema), or at least worsen the already abnormal or burdened heart. The legs or abdomen may swell all the more, or breathing may become more labored. Such aggravation of the condition may follow a long walk, especially if it is uphill, or climbing a few flights of stairs, or dancing briskly. One side of the heart is unable to propel the added output of blood that is necessitated by the increased demands following the exercise. Such people need rest to the mind and body and heart, and not exercise.

So much interest in physical exercise has been aroused in the minds of the public and so much emphasis has been placed on the role that exercise may play in preventing coronary disease that some cardiacs are injuring their health by excessive exercise. Many such individuals with val-

vular disease or high blood pressure with threatening congestive failure come to me and complain that they do not exercise enough. They state that their physicians do not permit them to do things they formerly enjoyed doing and that they are restricted too much. In many such cases these restrictions are wise and prevent or delay the onset of heart failure. Often, because of the conviction on the part of the patient that physical exercise is the cure-all, the patient will insist on struggling through his golf game or his brisk walk and learn of his folly only when it precipitates an attack of suffocation or collapse. Rest to the heart in these cases is the essential treatment; exercise, for the most part, is harmful. In a word, the value of rest or exercise is an individual matter to be decided by a wise physician.

There is a different aspect of the problem of exercise and heart disease that needs consideration. If exercise has some value in slowing down the development of coronary artery disease, is it worth the time spent in obtaining this slight gain? If a man spends six to eight hours a week playing golf, could he not gain as much by doing calisthenics every morning for fifteen minutes? Many people will gladly and wisely choose golf rather than calisthenics because they enjoy the outdoors, the fresh air, the mental relaxation, and the social contacts of a game of golf. But there should be a clear understanding as to what the advantages to the heart may be. There certainly are many who feel that they can spend the six or eight hours a week to greater profit in some other way. A person may have a book to write, urgent work or extra studying to do, in order to carry on his responsibilities better; and he may find that he can obtain whatever advantages physical exercise may entail by doing fifteen minutes of setting-up exercises every morning or by taking a brisk walk every evening. To obtain some temporary relaxation, he might play the piano for a brief interval. He may even wish to sit back, smoke a pipe, and just muse before returning to his labors. There are others who feel that their work is so urgent and important that they are unwilling to lose these hours every week, even if, as a result, their lives are shortened a few weeks, or a few months, or even a year or so. There is more in life than just living, and there are many individuals who would prefer to live a shorter life, but accomplish certain goals, than to live a little longer and get less done.

Not all people enjoy physical exercise. Some prefer relaxation obtained in a more sedentary fashion, with music, painting, or reading. Exercise and physical strength are certainly necessary for specific purposes, such as developing good fighting soldiers. This is vital for national defense. But it is doubtful that many years are necessary to accom-

plish that degree of physical fitness. Training and exercise are also required for those who are to do physical labor. Prizefighters, teamsters, longshoremen need physical strength. Men who perform hard physical labor generally develop the capacity to carry on such strenuous effort gradually, without any formal preparation for it. But would it have helped to develop men like Michelangelo, Isaac Newton, or Albert Einstein if they were to have exercised six to eight hours weekly?

During the Second World War, in the race between Germany on the one hand and the United States, Great Britain, and France on the other, there was little time to waste in the development of the first atomic bomb. Hours saved by our scientists were precious. The result of that war would have been quite different if Germany had been able to drop atom bombs on England before we could have retaliated. In the lives of many individuals, circumstances may be much less urgent but nevertheless sufficiently pressing to make it desirable to forgo questionable advantages concerning longevity of life and to concentrate on an important job that needs to be done now.

Regular physical exercise is a source of relaxation and enjoyment to many. It makes some people feel better and gives them a sense of well-being. There is some evidence that it may lessen the ill effects of coronary sclerosis. But there is also

reason to believe that unusual physical effort such as running, heavy lifting, and shoveling snow can be injurious and even fatal to those who already have manifested evidence of coronary disease and to the many men over fifty years of age who have silent coronary disease, which neither they nor their physicians can be aware of. With such individuals, and with those who have only a suspicion of heart disease or a strong family history of cardiac vulnerability, it is the better part of wisdom to exercise moderately and not to tempt danger.

Furthermore, physical exercise can be injurious to the large group of individuals who have organic heart disease where the threat of congestive failure is present. Finally, the biologic advantages of physical exercise may be attained, to a great degree, by calisthenics, indoor measures, or a brisk fifteen- to thirty-minute walk, thereby saving a great deal of time. Outdoor exercise, such as playing golf, is enjoyable, but for he whose time is precious it must not be regarded as a great loss if he remains a nongolfer. There are many citizens who continue to lead happy lives and make valuable contributions to our society who obtain their mental relaxation by nonphysical means or by indoor methods that are not time-consuming. Like many problems in life, the value and use of physical exercise is an individual matter. What is good for one may be harmful to another.

OUR FORTUNES TOLD

BY JOAN SWIFT

After reading span-of-life is carried in the genes.

Then it is, after all, written in the palm,
Like those crow's-foot lines a soothsayer reads.
"You will have long life," or "Skater on a warm

Pond, the ice breaks." The skin's opaque cells, the blood's,
Red and white, hold a past and a prophecy.
The seer traces a sign. "You delight in words.

Like to handle money, lose your temper": my
Inheritance. In this room full of green plants
And people, each is locked in his own cells, day

After day, knowing there are few accidents
With eyes, leaf shapes, the petals of dahlias, and
How arms grow full then empty, our deep pigments

Dark or pale. Lover, loved, take my hand, woodland
Of ferny prints and chromosomes. Curl your fate
In my fingers this one blue day, this second.