British Medical Association Lecture

ON

THE TREATMENT OF CARDIAC CASES*

BY

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I have often noticed that when I am honoured by an invitation to address a meeting such as this, the secretary suggests as a suitable topic "modern methods in the diagnosis," or "modern methods in the treatment," of whatever pathological state happens to be specially to the fore in the medical press at the time. Now I do not for one moment wish to criticize this desire to hear about recent developments—they are not always advances—in our art, for it is as admirable to be progressive as it is reprehensible to be reactionary. But in our efforts to keep in the van of progress there is a risk of travelling too far from the base of assured facts, so that we may find ourselves, for instance, dosing our hypertensive patients with the latest muscle or pancreatic extract, so persuasively introduced to us by its enthusiastic manufacturers, rather than giving them humdrum advice as to regime, from which, in the end, they are more likely to benefit.

I have purposely chosen as my text "the treatment of cardiac cases" rather than "the treatment of cardiac disease," because a very considerable proportion of cardiac cases have, as you know, no cardiac disease. By a "cardiac case" I mean a patient whose symptoms, such as shortness of breath, palpitations, or precordial pain, suggest to him, and possibly to his doctor, that the heart is at fault. Before we attempt to treat such a case it is essential that we establish as accurate a diagnosis as we can, and this diagnosis should be a comprehensive one, embracing, if possible, aetiology, morbid anatomy, and disturbance of function. For example, we should not be satisfied with a diagnosis of, say, mitral stenosis, but should aim at describing such a condition as a case of rheumatic heart disease with mitral stenosis and, it may be, auricular fibrillation, with or without congestive failure.

It may interest you to study the figures of an aetiological classification of cardiac cases as seen in consulting cardiological practice. They are as follows:

843 Cardiac Cases (private practice):			
Neuropathic	...	...	29.5 per cent.
591 Cases of Organic Heart Disease:			
Congenital	...	...	3.0 "
Infective	...	...	11.0 "
Rheumatic	...	...	5.6 "
Syphilitic	...	...	1.5 "
Endocarditis (acute or subacute)	...	...	0.9 "
Various	...	...	3.0 "
Toxic	...	...	8.0 "
Thyroid	...	...	5.0 "
Alcoholic	...	...	1.5 "
Various	...	...	1.5 "
Degenerative	...	...	62.9 "
Hypertensive	...	...	31.3 "
Decrescent	...	...	31.6 "
Respiratory	...	...	4.9 "
Doubtful and unclassified	...	...	10.0 "

I am sure you will be surprised at the relative infrequency of valvular disease, the incidence of which is only 5.6 per cent., or about the same as that of the thyrotoxic heart. It will be seen that nearly one-third of the patients sent to the cardiologist have, so far as he can ascertain, no organic cardiovascular disease, and that there is an overwhelming preponderance of the hypertensive and decrescent cases (by decrescent cases I mean those in which there is believed to be myocardial degenerative change, presumably secondary to coronary sclerosis, and not attended or preceded by hypertension).

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To the average medical man I think it is still true that "heart disease" is almost synonymous with valvular disease and murmurs. This is not surprising, for the bulk of the cardiac cases which he sees in his student days have valvular disease, and most of the pages of his textbooks are devoted to valvular disease, pericarditis, and thoracic aneurysm, with perhaps one skimpy chapter giving a very inadequate account of the all-important hypertensive and decrescent cases. Even that valuable journal *Heart*, quite rightly the pride of English cardiology, is not without sin in this respect, for not long ago there appeared in it a contribution of fundamental importance by R. T. Grant entitled "After-histories for Ten Years of a Thousand Men Suffering from Heart Disease" (vol. xvi, p. 275). This paper is invaluable as a store of statistical evidence as to the prognosis in various forms of valvular disease, and I advise you all to read it. But unfortunately it gives an entirely erroneous view of the relative incidence of the various aetiological varieties of cardiovascular disease as seen in ordinary practice, based as it is on a selected group of the population—namely, war pensioners—in whom, for very obvious reasons, valvular disease predominated.

Now a word or two as to the treatment of cardiac cases in general. I have a conviction that, as a profession, we tend to treat these patients with an excess of caution, erring in the direction of too much rest, and unduly limiting activities. Very rarely do I see cases in which harm has been done by a doctor encouraging his patient to overexert himself; whereas I constantly see patients on whom undue restrictions have been enjoined, and in whom, as a result, it is sometimes very difficult to restore confidence in the heart's capacity for effort. We all know that prolonged rest is essential after any acute infection of the heart, and especially if this infection is rheumatic. So, also, great caution must be enjoined during convalescence from diphtheria, even though there may have been no obvious manifestations of cardiac damage during the acute stage of the illness. Though prolonged rest in bed is rarely necessary during convalescence from acute tonsillitis or influenza, violent effort should never be allowed too soon after these infections. School doctors should impress on house-masters and matrons the importance of not allowing a boy to run races or play games during convalescence from such infections, even when apparently trivial. The few instances that have come to my notice in which harm has been done by exercises have been where a boy has been allowed to race, or to play in an important match, the day after some mild or brief febrile illness—perhaps one not considered of sufficient importance to be reported to the school doctor.

THE "SCHOOLBOY'S HEART"

This leads me to say a word or two about that perhaps most difficult of all cardiac conditions from the doctor's point of view—the "schoolboy's heart." You are all familiar with this picture; usually a rapidly growing boy, often the son of over-anxious parents, and sometimes a boy who is not altogether averse from being excused from games. He complains of palpitations, and possibly of apical pains, and says he gets more easily "winded" than other boys. The apex beat is perhaps forcible and diffuse, and is felt in, or even outside, the nipple line. The heart rate may be rapid, and accelerates unduly on effort or on emotion. There is often a systolic murmur, and in most cases the symptoms date from the discovery of this murmur, generally during a routine examination in the course of some febrile illness. The boy is brought to you by his parents, who are usually anxious that he should be excused from games. The decision in such a case is often a difficult and an exceedingly important one. We must be very careful not to

attach a cardiac label to such a boy at a very impressionable age unless we are quite certain that his heart is in fact an unhealthy one; and we must not run the risk of ruining his school, and probably also his after life, by imposing unnecessary restrictions on him. If there is a definite history of recent rheumatism, or if there is conclusive evidence of valvular disease, or if the heart is without a doubt enlarged, we have no option but to forbid games. But we must not pay any attention to cardio-respiratory, or to so-called haemic, murmurs, and we must remember that many boys have an apex beat in, or even outside, the nipple line without any cardiac enlargement. X-ray examination is of great assistance in these doubtful cases, because it is the only means of ascertaining the size and, even more important, the shape of the heart. My usual practice is to allow games under the supervision of the school doctor, possibly forbidding races, rope-climbing, etc., for a time. I have never heard of any harm resulting, and I am quite certain that the boys' parents would not keep me in ignorance of any evil consequence of my advice! Most of these cases are akin to the "soldier's heart" or the "effort syndrome" of Lewis, and the more you rest them the worse they become, and the more difficult they are to cure once you have finally decided that there is no organic heart disease.

CARDIAC NEUROSES

Let us now discuss the treatment of the cardiac neuroses, which, as I said before, constitute nearly a third of the cases sent to the cardiologist. Here treatment may almost be summed up in a single word—reassurance. But the reassurance must be emphatic and without reservation. It is no use telling these patients that "the heart is a little flabby, but there is nothing seriously wrong," or that "there is a slight murmur, of no great importance." It should always be remembered that in the lay mind anything amiss with the heart, however slight, conjures up future, or even present, possibilities of sudden death, and that it is fear which is at the root of their symptoms. Once we have satisfied ourselves, after careful investigations, including, if possible, electrocardiographic and x-ray investigations (for these help to carry conviction to the patient as well as to ourselves), that the heart is healthy, it is our duty to assure the patient that there is nothing whatever wrong with his heart, and that no restrictions of any sort are necessary. In the case of a patient who has been reduced to a state of cardiac invalidism it may not be politic, or indeed possible, to remove all restrictions at once, but even in such a case we should aim at a return to normal life and full physical effort at the earliest possible date. Massage, passive movements, and, later, graduated exercises may be useful here in the early stages of physical re-education.

Drugs play a very subsidiary part in the treatment of these cases, though a short course of bromide or luminal may be helpful. Digitalis is usually contraindicated; it seldom has any beneficial effect on a nervous tachycardia, and the very fact that digitalis is prescribed is apt to foster the patient's conviction that his heart is diseased.

I am fully alive to the fact that in a few cases the doctor runs a certain risk to his reputation by giving such advice. This is especially true in the case of those nervous patients without any physical signs of organic disease, whose history is suggestive, but not conclusive, of angina pectoris. Even here, I think, one is usually justified in the patient's interests in coming down firmly on the functional side of the diagnostic fence, and in taking an entirely optimistic view of the future to the patient, even though one may have some personal reservations as to the diagnosis. Undoubtedly we take a certain amount of risk by telling such a patient that there

is nothing wrong with his heart, and no need for any restrictions. But it is the only means of curing the patient, who never knows the risk we run in effecting his cure.

ORGANIC CARDIOVASCULAR DISEASE

I have not left myself much time in which to discuss the treatment of organic heart disease. Even here the psychological aspect of the problem must not be disregarded. We must remember that associated with any organic disease there is often a very considerable element of anxiety state. A patient suffering from mitral stenosis, for example, knowing that her heart is diseased, may suffer from precordial pain, from palpitations, and even from dyspnoea, all of purely psychological origin and not directly attributable to the undoubted organic heart lesion. So also an apprehensive man who suffers from angina pectoris due to coronary arteriosclerosis may, through sheer funk, drift into such a state of vasomotor irritability that anginal attacks are induced on the slightest exertion or emotional upset—another example of a functional superstructure on an organic basis. Clearly, then, psychotherapy in the form of reassurance and explanations as to the genesis of symptoms must play an important part in the therapy even of organic heart disease, though this aspect of the treatment is only too often neglected.

Another common mistake is the assumption that all organic heart disease must *ipso facto* produce symptoms and require treatment. I need hardly remind you that this is not true. We all know that valvular disease is often compatible with a normal quiet life, producing no symptoms at all so long as the individual is fortunate enough to be unaware of its existence. For a few years after the war our hospital out-patient departments were thronged with men suffering from valvular disease, real or imaginary, and full of symptoms. Their murmurs had been discovered by medical boards in the Army, they had been "pensioned out," and had suffered from palpitations, precordial pains, etc., ever since. Now, fifteen years after the war, valvular disease has once more become relatively infrequent in the out-patient departments. The subjects of it are, for the most part, at work, symptomless and blissfully unconscious of any disability.

It behoves us, therefore, when we discover the existence of valvular disease, to determine to what extent, if at all, the efficiency of the heart as a pump is impaired, and whether any of the symptoms complained of are due to the organic lesion or to an added anxiety state. We must inquire carefully whether there is any evidence of undue dyspnoea on effort, and if there is, we must note the degree of effort that is required to produce such distress. We must also ascertain whether the patient is able to sleep well with not more than two pillows, and without attacks of nocturnal dyspnoea and wheezing. We look for early signs of congestive failure, engorgement of the neck veins, oedema of the bases of the lungs, and a tender enlargement of the liver. We inquire as to oedema of the ankles at the end of the day.

If a patient is able to carry on the ordinary routine of his life without undue dyspnoea, if he sleeps well, and if there is no evidence of early congestive failure, we can assure him that his valvular lesion is no serious disability, and is compatible with many years of average health. He must not attempt any exertion which makes him badly out of breath, and he must be strictly moderate in food, alcohol, and tobacco. He must lead as normal a life as he can within his limits, and the less medicinal treatment he has the better for him, although he would be wise to undergo periodical medical examinations, and he must send for his doctor at once if he develops a febrile illness.

INDICATIONS FOR DIGITALIS AND QUINIDINE

When, on the other hand, there is evidence of early congestive failure, or a history of paroxysmal nocturnal dyspnoea, strict rest in bed must be enforced until such signs or symptoms have disappeared, after which cautious experiments must be made to determine how much exercise, and how long a day, can be allowed with safety. It is unnecessary for me to detail the treatment of advanced congestive failure, with oedema and ascites. I need only remind you that if auricular fibrillation is present digitalis must be given in adequate dosage; in other words, it must be pushed until signs of intolerance appear, such as nausea, vomiting, or diarrhoea, or until the ventricular rate by auscultation falls to about 70. It must be stopped at once when the rate falls below 60, and also if digitalis coupling appears. I still see patients who are suffering from auricular fibrillation with gross congestive failure being treated with such an inadequate dose as ten or even five minims of the tincture three times a day.

When dropsy persists in spite of adequate digitalization, or in the absence of fibrillation, when digitalis is not nearly so effective, the mercurial diuretics are often successful. Salyrgan is safer than novasurol, and novurit is, I think, safer and better than either; but any one of these three preparations may be successful where the others have failed.

Venesection, and, in obstinate cases of dropsy, the insertion of Southey's tubes, are not, in my experience, employed quite as often and as early as they should be.

For the relief of paroxysmal nocturnal dyspnoea no drug is comparable with morphine, which is too often withheld; not only does it relieve the distressing symptoms, but after a few good nights so obtained an astonishing improvement in the patient's general condition may be observed.

Quinidine is a drug which is used at times somewhat rashly, and in unsuitable cases. It may be helpful, therefore, to say a few words as to the indications for quinidine therapy. Quinidine is perhaps most valuable in the prophylactic treatment of auricular fibrillation. Paroxysms of fibrillation sometimes occur during the early stages of myocardial degeneration; as time goes on these paroxysms become more frequent and more prolonged, until, eventually, fibrillation becomes continuous, with a considerable resultant disability. By a daily dose of three or five grains of quinidine it is often possible to prevent such paroxysms, and to postpone for some years the advent of established fibrillation. What are the indications for quinidine therapy once fibrillation has become established? They are: a short history of fibrillation; absence of valvular disease—and especially of mitral stenosis; absence of any evidence of congestive failure; and an electrocardiograph which shows no evidence of gross myocardial change apart from the fibrillation.

In fibrillation associated with a toxic goitre also quinidine is often successful, though in most cases thyroidectomy is necessary sooner or later if normal rhythm is to be maintained. May I take this opportunity of reminding you of the importance of considering the possibility of a thyrotoxicosis when investigating a case of auricular fibrillation of obscure aetiology? It does not appear to be generally recognized that quite a small, and not at all an obvious, adenoma of the thyroid gland may cause auricular fibrillation, and may do so with very little evidence of other thyrotoxicosis; for instance, there may be no obvious proptosis, no tremor and no sweating, and the basal metabolic rate may be little, if at all, increased. Nevertheless, surgical treatment of such cases is usually followed by restoration of normal rhythm, so that I need not further emphasize the importance of early recognition of this type of case.

THE MINERAL BASIS OF LIFE*

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Most medical men were brought up on the teaching that, in spite of the great variety of the elemental constituents of the inorganic world, the living body was extremely selective in its needs, and made use of only a few of these elements. For many years the occasional presence of traces of others has been reported by various workers, but their observations have attracted little interest, and it was generally thought that they were accidental contaminants. It is now recognized that the original list of the constituents of protoplasm (C, H, O, N, S, P, Na, Ca, K, Mg, Cl, I, Fe) must be widely extended. In the first place, new methods of research, both chemical and physical, have shown that many other elements, particularly metallic ones, are commonly present in animals and plants. Secondly, there are certain observations which tend to show that in the course of evolution nature has been making experiments in the attempt to find the most suitable metal for certain functions, particularly for use in the respiratory pigments.

The most important evidence that the original list is too exclusive, however, is the successful demonstration by the Wisconsin school, led by Hart, Steenbock, and Elvehjem, of the essential role of copper in the formation of haemoglobin. Their work, which has now become classical, indicates that the presence of copper can no longer be regarded as accidental—the metal, though present only in "traces," has a definite function in which it cannot be replaced by any other element. It is this work in particular, and also the demonstration of the necessity of certain other elements for plant life, that has stimulated a search for those that may be found to occur in living tissues, and for the functions that they may perform. It may be said at once that the former line of work is much the easier, and that in consequence our knowledge of it is in a more advanced state. The pioneer work of Bertrand in Paris, and of Ramage in Norwich, has contributed greatly to our knowledge. The discovery of the actual function in cell metabolism of the mineral constituents presents a problem that does not often yield readily to frontal attack, and depends on the general advance of biochemical knowledge. This may be seen in the case of magnesium, where the recent investigations on the processes of fermentation and of muscular contraction have shown that this element possesses a specific action on the phosphatase enzymes. A review of the mineral basis of life must therefore at the present time largely concern itself with a review of the various elements which have been found to occur with any constancy in living tissues.

1. *The Halogens*

The presence of chlorine in the body is well known, and its importance needs no stressing. The importance of iodine as a constituent of the thyroid secretion is also well known, but recent work indicates that the role of this element is not confined to its participation in the structure of thyroxine, and that it has other unsuspected activities. Iodine is a constant constituent of the blood in an amount that is generally agreed to be of the order of 12 γ per 100 c.cm. (1 γ = 1/1,000 mg.), the total amount in the blood being, therefore, less than one milligram.¹ The amount is raised in hyperthyroidism and lowered in hypothyroidism, and indeed the level of the blood iodine reflects the functional state of the

* Presidential address delivered to the Staffordshire Branch of the British Medical Association, October, 1933.