THE RECRUIT'S HEART

BY

E. NOBLE CHAMBERLAIN, M.D., M.Sc., F.R.C.P.

*Honorary Physician to the Heart Clinic, the Royal Infirmary,
Liverpool*

The following analysis is presented to call attention to the types of problem met with in the grading of abnormal conditions of the cardiovascular system. The series includes 130 cases referred from recruitment medical boards. Most of them were sent on account of murmurs, a few on account of tachycardia or abnormal rhythms, and a few because of a rheumatic history associated with minor abnormalities of the heart sounds or rhythm. The instructions for grading these cases are laid down, and are in the possession of the chairmen of the medical boards. Reference to some of these instructions was made in the *Journal* of August 10, 1940 (p. 201), under the title of "Effort Syndrome," giving the results of Lord Horder's Committee's recommendations to the Minister of Labour on the examination of the cardiovascular system. These instructions are a valuable guide to the medical boards, and the following series of cases has been considered with special reference to the instructions to see how far the individual case is cared for by the details given.

It is presumed that most of the cases included here presented some doubtful point in diagnosis or assessment of the grading. The frank cases of valvular disease, hypertension, and grosser cardiac irregularities would no doubt have been diagnosed and classified without any difficulty. It is therefore of some interest to observe which of the series required special methods of examination such as radiograph or electrocardiogram before a satisfactory opinion could be given. The cases are perhaps best dealt with under the headings of the diagnosis made, which included: (1) murmurs without organic significance; (2) murmurs indicative of organic disease; (3) hypertension; (4) effort syndrome; (5) abnormal rhythms; and (6) cardiovascular degeneration.

Murmurs without Organic Significance

Lord Horder's Committee makes the following recommendations on systolic murmurs:

"A systolic murmur heard at the apex cannot be accepted in itself as evidence of structural disease of the heart, but when it is present a high grade of exercise tolerance should be required and care should be taken to exclude enlargement and mitral or aortic disease. A history of acute rheumatism or of dyspnoea on exertion, or the characters of the murmur, may help in the diagnosis. If the systolic bruit is slight and is the only abnormal sign the man may be accepted as Grade I provided he has good exercise tolerance."

In the present series a systolic murmur without other grossly abnormal signs was found in 36 cases, and these were recommended for full military service. It is of interest to note that in 28 cases the murmur was apical, in 3 basal only, and in 5 apical and basal. Of the apical murmurs 9 were audible in recumbency only. The remainder were heard to a less degree in the erect posture, but in only 1 case was the murmur audible more clearly in the erect position. Some of the murmurs were soft and some roughish in character, but none was really harsh. At the apex the murmur was noted to be soft in 26 cases out of 32. Slight conduction of the apical murmur towards the axilla occurred in 5, but, as it is generally conceded that conduction is merely an expression of the intensity of the murmur, this was not held to be evidence of organic changes in the mitral valve. X-ray screening

showed the heart in all cases to be within the physiological limits of shape and size.

It is of course true that little is known of the origin of systolic murmurs, which are usually regarded as harmless, but general experience since the last war has shown that murmurs such as occurred in the present group may persist indefinitely without any further signs of valvular heart disease appearing and without any functional incapacity of the organ.

In connexion with these systolic murmurs it should be added that other slight deviations from the normal were occasionally present and were not considered sufficient to relegate the patient to a lower grade. They included slight forcibility or diffuseness of the cardiac apex beat, which usually settled down towards the end of the examination and was clearly emotional in origin; occasional reduplication of either the mitral first or the pulmonary second sound; extrasystoles; and occasional slight radiological convexity of the pulmonary arc (which was regarded as within physiological bounds) and minor deviations in the electrical axis. The systolic murmurs considered to indicate organic disease are dealt with later.

Murmurs Indicative of Organic Disease

1. Mitral Disease.—Twenty-three cases in all fell into this group. In 9 of these it was possible to diagnose mitral stenosis on clinical grounds by the discovery of the usual diastolic or presystolic murmur. It is only necessary to add that the familiar methods of eliciting these murmurs in doubtful cases once again proved their usefulness—namely, that the murmur was often audible only in recumbency, especially with the patient lying partially on the left side, and in all cases the murmur was much more evident after exercise. Many of these cases presented no cardiac symptoms, and the patient was capable of good physical effort, in two instances of work as dock labourers. The remaining cases in which the murmur was systolic present the greatest difficulty, and it is sometimes impossible to give a dogmatic opinion as to the suitability of the recruit for military service. None the less, in some the murmur, though systolic in tone, was combined with adverse features sufficient to suggest that the individual would not be fit for full military service. The following case illustrates this point:

"Rheumatism in 1927. Cardiac impulse forcible but not diffuse. Apical systolic murmur persistent and conducted slightly. Slight impurity of the aortic second sound but no definite aortic diastolic murmur. Radiograph: Moderate generalized enlargement with rounding of the left ventricle, some dilatation of the aorta, and definite right auricular enlargement."

Another case, on the other hand, left some doubt as to whether the mitral valve was actually affected, but the combination of a conducted systolic murmur with forcibility of the cardiac apex beat and a fairly recent history of serious internal haemorrhage made it desirable to put the patient in a low grade more on general principles than from conviction of the organic nature of the valvular murmur.

In all, 15 patients in whom the presenting abnormality was a systolic murmur were recommended for lower grading. In a few of these it was thought that Grade II might be suitable, as, for example, in a man with a history of repeated rheumatism and a systolic murmur who had a good exercise-tolerance test and a normal radiograph and electrocardiogram. Similarly, in 2 cases with systolic murmur the radiograph showed slight prominence of the pulmonary arc. Such cases left a little doubt as to whether they were really suitable for Grade I, although it was thought probable that there was no organic heart

disease. Similar doubt existed with regard to another 2 cases in which the systolic murmur was accompanied by rather more arteriosclerosis than one would have expected in a young man. Still lower grading was recommended when the systolic murmur was associated with well-defined cardiac enlargement, especially right auricular enlargement or pronounced prominence of the pulmonary arc as detected radiologically. In some cases the systolic murmur was accompanied by a history of rheumatism and other suspicious signs—e.g., systolic shock, a doubtful diastolic murmur, or pronounced right ventricular preponderance. Several cases were recommended for low grading on account of systolic murmurs and an associated condition such as bronchitis, emphysema, or doubtful hyperthyroidism. In only 1 case was the electrocardiogram the deciding factor. In this the systolic murmur without other physical signs was associated with prolongation of the P-R interval.

2. Aortic Disease.—Five cases of aortic regurgitation were found in the series. In 2 others aortic and mitral disease were combined. In all these cases compensation was perfect, and in several the men were doing very laborious work. In 1 case aortic stenosis was associated with the regurgitation. Radiological and electrocardiographic changes were found to support the clinical diagnosis, though they were scarcely necessary.

3. Congenital Heart Disease.—Six cases were detected—2 with patent ductus arteriosus and 4 with septal defects. They were easily determined on the typical murmurs, though characteristic radiological changes were often present. Two of the patients were capable of good physical effort, but the others were either of poor physique and correspondingly incapable of such exertion or had been warned since childhood not to take strenuous exercise.

From the point of view of grouping, cases of proved organic valvular disease or congenital heart disease must be regarded as unsuitable for military service if the instructions to the medical boards are carried out precisely. It is of course perfectly true that many of them are capable of heavy physical work, and there is little doubt that a dock labourer with aortic regurgitation would probably be far more capable of standing up to the rigours of military service than a weedy clerk with a mild grade of effort syndrome. There is therefore some reason for the views put forward by Bourne (1940) in advising that certain of these subjects would be fit for military service. In dealing with the problem, however, from the broader point of view of the nation we must take into consideration the fact that there are great chances of an individual with acquired valvular or congenital heart disease deteriorating within the period of his military service. In such an event it would be difficult to prove that the military service, even when of a selected character (if, indeed, such service exists in the Army), might not have been an accelerating factor and so have rendered him a charge on the nation. Further, it is common knowledge that men with valvular lesions, congenital or acquired, showing perfect compensation for many years, may suddenly and unexpectedly break down with the symptoms of congestive heart failure; they are, moreover, always potential subjects for infective endocarditis.

Hypertension

Seven cases were found in which the principal feature was arterial hypertension. In 6 of these the men had a good cardiac reserve and were capable of playing games. Even in a case in which there was a pressure of 250/110 and accompanying cardiac enlargement and arteriosclerosis the patient played football. When the rise of blood pressure was pronounced or was accompanied by radiological changes or considerable arteriosclerosis the patient

was recommended for low grading, but when the rise of blood pressure was moderate—e.g., up to 170 systolic—and there was no rise in diastolic pressure or other evidence of cardiovascular degeneration, further readings were recommended before final grading.

Effort Syndrome

After systolic murmurs this group of cases presents the greatest difficulties. No doubt the obvious cases with constitutional evidence of poor physique, nervousness, tremors, blue hands, and so forth were dealt with by the medical boards, so that the cases referred to here were of the borderline type. In none of the 17 cases classified as effort syndrome were there any pronounced symptoms, and the patients were referred chiefly on account of murmurs or tachycardia, or both.

One of the difficulties is to decide whether cases of tachycardia with little or no impairment of the exercise-tolerance test should be classified as effort syndrome. The line taken was to assume that such minor variations from the normal were due to apprehension at the medical examination, and, providing the patient gave a history of good capacity for physical exertion and presented no other abnormal features, he was recommended either for Grade I, or for Grade II during a period of initial training with the expectation that he might be raised later to Grade I.

All the 9 cases recommended for lower grading were engaged in clerical or similar light work, all showed a poor exercise-tolerance test, and most had systolic murmurs at the apex. Even these cases were not recommended for permanent low grading, but for training with the object of determining their ultimate capacity for physical work and the strain of military life.

Abnormal Rhythms

Two cases were found which gave a clinical history diagnostic of paroxysmal tachycardia—namely, an abrupt onset and offset of tachycardia lasting some minutes to an hour or two. They presented no other signs of organic cardiovascular disease, and the cardiac compensation was good. Nevertheless it was felt that such cases would be so uncertain in military life as to make these subjects unsuitable as soldiers.

In another 8 cases recommended for full service clinical and electrocardiographic measures showed the arrhythmia to be of a harmless variety—chiefly extrasystoles—though in 1 case the pronounced sinus arrhythmia with bradycardia raised a suspicion of heart-block, which was disproved by the electrocardiogram. One case showed a typical pulsus bigeminus confirmed by electrocardiogram as a ventricular extrasystole after each normal beat. In every other way the cardiovascular system was intact, and it was felt that this rhythm was physiological for the individual and should be no bar to full military service.

Cardiovascular Degeneration

A few cases were found in which, for the man's age, there was undue arteriosclerosis, sometimes with slight radiological changes or left axis deviation. For the most part these men were recommended for slightly lower grading, but it was felt that any further changes in the cardiovascular system would be so gradual as scarcely to be modified by a reasonable period of military service.

Finally, it should be mentioned that there were a few cases with disabilities, non-cardiac in origin, but perhaps accompanied by some minor changes in the cardiovascular system—for example, 1 case of doubtful hyperthyroidism, 1 of diaphragmatic eventration, and several of bronchitis with emphysema.

Summary

A brief analysis is presented of 130 recruits referred by Ministry of Labour medical boards for special examination of the cardiovascular system. The difficulties of the systolic murmur and borderline effort syndrome cases are considered, and attention is drawn to occasional radiological and electrocardiographical changes leading to lower grading in patients in whom the clinical signs were equivocal. I have indicated some of my views on grading, but am well aware that in many of the problems presented there is no room for dogmatism. Further, the actual grading is finally a matter not for the consultant but for the medical board.

I am very much indebted to my secretary, Miss K. Wolfenden, for her help in the preparation of this paper.

REFERENCE

Bourne, Geoffrey (1940). *British Medical Journal*, 2, 442.

ALLERGIC ECZEMA AND CATARACT

BY

J. G. MILNER, F.R.C.S.

The eyes are not uncommonly involved in diseases of the skin. The lids, conjunctiva, and cornea may all become affected. Sometimes the ocular disturbance is slight—for example, a mild blepharo-conjunctivitis associated with a dry scurfy scalp—but a much more severe reaction may occur, as in the keratitis accompanying facial rosacea. In this disease there is never rosacea keratitis without facial rosacea, and although local applications in both instances are beneficial the important treatment is that of the underlying metabolic cause. If this can be suitably treated both skin and eyes improve very considerably, suggesting a common origin for the two diseases.

That the conjunctiva and superficial layers of the cornea should participate in diseases of the skin is not a matter for surprise. These structures are ectodermal in origin and would be expected to react to like stimuli. The lens is developed from surface ectoderm also, and, although its extreme modification of structure for the functions allotted to it render it a unique organ of the body, it is not illogical to expect it to respond to such stimuli as well. It could only do this, of course, by becoming opaque.

In fact, however, the lens is very rarely affected in skin disease. The majority of reported cases have been in patients suffering from neurodermatitis or scleroderma. In view of this rarity, I am prompted to report a case of anterior cataract associated—directly, I believe—with allergic eczema.

Case Report

The patient, a man aged 26, has been subject to attacks of allergic eczema for many years. Only in the last five years have the eyelids and eyebrows been affected. Other allergic manifestations have been asthma and colitis. All sorts of treatments have been tried (including x-ray applications to the face and elsewhere), and it is interesting to note that auto-haemotherapy is the only one which has given any relief. Several courses of calcium have been administered, as he is deficient in it. His father has similar allergic manifestations, but no eczema.

I first saw the patient in February, 1940, when he complained that for three months the right vision had been misty. On examination I found that there were fluffy opacities in the right lens, central in position, just beneath the anterior capsule. These opacities were accompanied by several vacuoles. Vision was 6/18 with slight correction. The left lens, except for two small vacuoles, was clear. Vision in this eye was 6/6 with a slight correction. It must here be recorded that one week later the right lens was unchanged, but the left had progressed to a state exactly resembling the right, and

vision in this eye was 6/18 also. I cannot account for this sudden and rapid increase in the left lens opacities: at the end of June there had been no further increase. Operation was not immediately advised, since, binocularly, he was able to carry on his work without much difficulty. After a few weeks, however, he found his vision varying and he was experiencing increasing discomfort while reading. Therefore, on February 28, 1940, the right lens was needed. A curette evacuation was performed the following day and he made an uneventful recovery. Vision is now 6/5 with correction.

It must be pointed out here that the dose of x rays which he had was not enough to cause an irradiation cataract. Further, the latent period was too short and, more important still, the actual appearance and position of the cataract were not such as are associated with irradiation, the features of which I have described elsewhere (Milner, 1934).

Literature

Rothmund in 1868 noted the presence of cataract associated with skin disease. Andogsky (1932) invented the term "cataracta dermatogenes" in the case of a young man with bilateral cataract and simultaneous skin eruption. Kurz (1924) reported a case of cataract associated with eczema in a girl aged 21. This patient had been given x-ray treatment, and Kurz suggested that the parathyroids may have been injured, the resulting dysfunction being responsible for the cataract. (It is not clear whether in this case there were in fact signs of parathyroid dysfunction.) Davis (1921) published the case of a girl of 15 who had a stellate cataract situated in the anterior layers of the lens and who suffered from eczema. He thought that the common origin of skin and lens correlated the two phenomena.

Daniel (1935), who quotes the above examples, demonstrated three cases. Two were in girls of 17 and the other in a man of 35. All three patients had allergic eczema and anterior cataract. Daniel suggested that the cataract changes were allergic in origin. Alan Woods, referring to Daniel's cases, suggested that in allergy the lens capsule (an ectodermal structure) participates in the general cutaneous allergic reaction and that its permeability might be altered. But, he says, there are objections to this unless it could be proved that the aqueous contains specific allergen. Woods gave it as his opinion that there was not enough evidence to warrant the term "allergic cataract."

Gronbläd (1940), referring to Rothmund's cases, says that they were probably examples of poikiloderma Jakobi, a rare skin disease which may be associated with cataract. Gronbläd also says: "Cataract has been noted in other skin diseases, but only in scleroderma and prurigo Besnier (neurodermatitis) is not uncommon." Prurigo Besnier is thought to be allergic. Thomson (quoted by Gronbläd) reported a few cases of poikiloderma Jakobi, one of which had ocular changes—myopia and optic atrophy—but no cataract. In a personal communication Thomson tells me he has never seen a case of cataract associated with eczema, although one was reported to him. Kugelberg (quoted by Gronbläd) said that the term "cataracta dermatogenes" is incorrect. The cataract is not a sequel to the cutaneous changes, but is on a par with them—i.e., "cataracta syndermatotica."

The likelihood of an underlying endocrine dysfunction in most of the types of skin disease that we have under review in this paper is stressed in the literature. Parathyroid disturbances are often found. The association of tetany (parathyroid insufficiency) and cataract is well known, and the cataract accompanying skin disease is said by some to be due to parathyroid dysfunction. This is, however, by no means certain.

Von Szily (1940) says: "Lenticular opacities are observed in those skin diseases which are presumably associated with endocrine disorders—i.e., neurodermatitis,