

Electrocardiography in general practice

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The practice consists of four principals and a trainee assistant working from central premises, and there are about 9,500 patients.

An electrocardiograph was first bought about 12 years ago. Initially its use was sporadic and experimental, partly because of lack of confidence and inexperience, and partly because the tracings of the earliest transistorised machines were not reliable.

Two years ago, we bought a modern machine (The Cambridge 'Transrite'), and now report 12 months use.

Methods

Three of the partners have learned to use the machine, and have studied the interpretation of electrocardiograms. One of us (M.C.) holds a clinical assistantship in a department of cardiology. To try to overcome the handicap of the small amount of clinical experience available to us individually, all the partners see and discuss all the tracings taken in the practice.

We have taught our practice nurse, who is an experienced sister, to take tracings by appointment, but the partners may take a tracing either in the surgery or in the patient's home when immediate results are needed.

Results

During the 12-month period (1971) 118 tracings (29 per partner) were taken, of which 51 (47 per cent) were abnormal. The main indications were chest pain, hypertension, and reassurance as part of routine cardiac investigation.

TABLE 1
ANALYSIS OF TRACINGS TAKEN IN 1971

<i>Analysis of ECGs taken</i>	<i>E.O.E.</i>	<i>M.C.</i>	<i>J.L.</i>	<i>N.W.</i>	<i>Total</i>
Normal tracings	11	29	11	15	66
ST—T changes	2	4	3	3	12
Acute myocardial infarction	0	5	1	7	13
Post myocardial infarction	4	5	1	0	10
Dysrhythmias	4	5	0	2	11
Conduction defects	1	3	0	1	5
TOTALS	22	51	16	28	117
Number abnormal	11	22	5	13	51
Per cent abnormal	50	43	46	47	46.5

TABLE 2

<i>Reason for taking ECG</i>	<i>E.O.E.</i>	<i>M.C.</i>	<i>J.L.</i>	<i>N.W.</i>	<i>Total</i>
Cardiac investigation	3	7	2	4	16
Chest pain	6	22	12	18	58
Dysrhythmia	4	3	—	2	9
Follow up	3	9	2	1	15
Routine general examination	6	10	—	3	19
	22	51	16	28	117

TABLE 3

COSTS:		£	£
(1) Capital cost of machine	(Cambridge 'Transrite')		250.00
(2) Maintenance costs	Batteries	3.60	
	Paper	4.62	
	Electrode jelly	1.62	
	Repairs	27.46	
		<hr/>	
		£37.30	
		<hr/>	

Chest pain

Chest pain was the reason for 58 (49 per cent) of the tracings taken and of these 35 (61 per cent) were abnormal, 13 (22 per cent) showing evidence of recent infarction and 11 (ten per cent) were admitted to hospital

Discussion

There is no doubt that it is in the differential diagnosis of chest pain that electrocardiography is most useful. Its value in general practice is no less than in hospital. The following two cases illustrate this:

Case 1—A hitherto fit male 37-year old clerk arrived at the end of a long evening surgery complaining of an acute epigastric pain which had started at work during the day, and had persisted since. There was no sweating, nausea or syncope and no previous dyspeptic history. He had finished his day's work and returned 25 miles by 'bus. Clinically the C.V.S., and abdomen appeared normal. The blood pressure was 120/80. In view of the persistence of the pain an immediate ECG was done which showed an acute anteroseptal infarct. He was admitted to the local coronary care unit. Later he developed multiple ectopic beats, but made a satisfactory recovery. He is now well on adrenergic blocking therapy.

In such a case as this where pain is atypical, and the patient devoid of physical signs an immediate ECG tracing is invaluable. It is possible that this patient might otherwise have been sent home and his subsequent history been less favourable.

Similarly a retrospective diagnosis can be helpful:

Case 2—A man of 76 had an attack of epigastric pain while away on holiday. He suffered from sweating, anorexia and lost all his energy for three days. He consulted a doctor at the time who found nothing wrong, but advised him to have a heart check on his return home. The ECG showed evidence of recent lateral infarction. Accordingly, he was advised about a suitable regime 'instead of simply being reassured'.

Hypertension and valvular disease

Greater awareness of the dangers of hypertension, especially in males, makes it obligatory for general practitioners to keep hypertensive patients under constant review. In such cases, as in valvular disease, ECG evidence of left ventricular hypertrophy is invaluable in drawing attention to those most liable to proceed to heart failure.

Dysrhythmias

In several cases tracings have proved helpful in the diagnosis of irregularities of the pulse. These included a patient with heart block and also one with unsuspected hypokalaemia.

Reassurance

Pain in the chest is a common presenting symptom offered to the family doctor, and can be the cause of much anxiety. While no screening tests are perfect, a normal ECG added to normal clinical and radiological findings make reassurance more effective (even if it is not greatly more justified on scientific grounds!)

Organisation of an ECG service

Both the Royal College of Physicians and the Royal College of General Practitioners (1972) are now agreed that electrocardiography can be helpful in the diagnosis and management of patients in general practice. The unanswered question is how such a service is best provided.

(1) *An emergency consultation service*

Short (1970) in reviewing the possibilities, favours an emergency consultation service in which the family doctor could refer patients with suspected coronary disease for an opinion the same day. Gray (1973) would prefer an extension of the coronary care unit which might admit and observe patients with suspicious chest pain on an 'open door' basis. These methods have obvious advantages, but would inevitably lead to an increase in hospital-based cardiological workload, and would not meet all the needs of general practice.

(2) *An open ECG referral service*

An example of the third possibility—a hospital-based referral service has been given by Morgan *et al.* (1970). There are some striking similarities in the figures of this report, and those in tables 1 and 2 above. Indeed the only significant difference is that the number of tracings per general practitioner in the hospital-based service was only ten as against 29 in our series. Our experience, as in Exeter, is that the number of tracings taken per annum is steadily increasing. We now tend, for example, to include an ECG as part of our routine investigation of all cases of serious hypertension. Significantly, however, the percentage of abnormal tracings in our series is almost exactly the same (49 per cent as against 47 per cent) as that in the hospital-based service. Clearly, the limit of usefulness of this form of investigation has not yet been reached.

These similarities must not, however, be allowed to cloud the very important difference in the service provided—the difference in immediacy. The greater speed and economy of the service provided by the general practitioners themselves puts it in a different category. In the hospital-based service, the general practitioners did not get a 'result' of the investigation for up to seven to ten days. This in our view throws considerable doubt over its value especially when there is a history of chest pain. Morgan *et al.* admit the possibility of a few patients coming to the department when they may not be fit to do so.

Conclusions

About ten per cent of general practitioners now attempt to provide their own service. Such selfsufficiency has three obvious advantages. It is economical, the 'results' are immediate, and it brings satisfaction to those who undertake it. However, as Short points out (1970) the crux of the matter is whether the general practitioner, even having acquired a working knowledge of the subject, can see enough cases to maintain his experience.

It is at present impossible to give a firm answer, but some observations are worth making in this connection.

First, certain conditions must be met, and these are listed below. Secondly, a general-practitioner service is much easier in group practice because of the possibilities of sharing both equipment and experience, and this advantage is enhanced if one or more members of the group also work as a member of a hospital team. Thirdly, the fact that a general practitioner cannot match the expertise of a specialist in cardiology is no more reason for him not to study and use electrocardiography in the 1970s than it was for him to reject the stethoscope in the last century. Indeed, there are reasons for taking the opposite view. Complicated though it is, electrocardiography is a logical subject, and unlike the use of the stethoscope it is not dependent upon subjective assessment. Tracings can be taken home and studied at leisure, or taken to an expert and discussed with him.

We believe it is not beyond the ability of general practitioners who are sufficiently interested, to acquire a useful working knowledge of the subject and we believe we are providing a better service to our patients than can be provided by a hospital-based referral service. It has certainly increased our interest in patients with cardiovascular disease, and therefore probably our skills in dealing with them.

The conditions necessary for electrocardiography in general practice are in our view:

- (1) That the practitioners shall have had appropriate training and be prepared to maintain it,
- (2) That the service is not regarded as completely selfsufficient, i.e. that no patient who needs it is denied specialist advice,
- (3) That the limitations of electrocardiography as a screening test are kept constantly in mind,

(4) That general practitioners should be reimbursed so that at least the expenses of running the service are met.

Summary

1. The experience of a group practice using an electrocardiograph is described.
2. Comparisons are made with hospital-based services.
3. Given certain safeguards and consultant support when needed, we believe that a better service can be given when general practitioners provide their own service.
4. The safeguards needed for such a service are listed.

Acknowledgement

We are greatly indebted to Dr Ian Gray, F.R.C.P., for helpful criticism in the preparation of this article.

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Dr. A retired in 1970

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