

PAPERS AND ORIGINALS

Attitudes and Long-term Adjustment of Patients Surviving Cardiac Arrest

M. DOBSON, A. E. TATTERSFIELD, M. W. ADLER, M. W. McNICOL

British Medical Journal, 1971, 3, 207-212

Summary

Twenty patients surviving cardiac resuscitation following myocardial infarction were seen at least six months after the cardiac arrest. The patient and spouse were interviewed separately. Though they had not usually been informed by the medical staff, 16 of the 20 patients were aware that a cardiac arrest had occurred and had a good understanding of what this meant. Six patients remembered the start or end of the cardiac arrest and five specifically remembered external cardiac massage. Their feelings and their attitudes to the cardiac arrest are described.

Initial anxiety was experienced by all the patients and their spouses, particularly after hospital discharge, but in the long term only five patients failed to make a reasonably satisfactory adjustment. Poor rehabilitation seemed to be mainly associated with persisting physical disability and personality factors and not with features associated with the cardiac arrest, such as the duration of external cardiac massage. The spouses often found it difficult to know exactly how to treat the patients after hospital discharge and most patients and spouses felt that more explanation and discussion with the medical staff would have helped to alleviate anxiety.

Introduction

Improved methods of diagnosis and treatment of cardiac arrest are resulting in the effective resuscitation and long-term

survival of an increasing number of patients. The physical prognosis of these patients does not seem to be unfavourable (Johnson *et al.*, 1967; Lawrie, 1969; McNamee *et al.*, 1970), but little is known about the patients' understanding and attitude to cardiac resuscitation and their subsequent long-term psychological adaptation. At the Central Middlesex Hospital, where this study was undertaken, there are about 25 such survivors a year, most of whom are patients with myocardial infarction. It was the usual practice to inform the relatives but not the patients about any episodes of cardiac arrest, and it had in general been assumed that most patients were unaware of the true nature of cardiac resuscitation.

During a study on psychological and social factors in patients admitted to a coronary care unit (Dominian and Dobson, 1969) it became apparent that many patients surviving cardiac arrest were aware of this phenomenon and that they probably wished to discuss it to a greater extent than was recognized by the physicians. Twenty consecutive long-term cardiac arrest survivors from the coronary care unit were therefore studied six months to two years after the cardiac arrest in order to explore their attitude and feelings about this experience and to assess their psychological, social, and physical adjustment.

Patients and Cardiac Arrest

The clinical details of the 20 patients (19 men and 1 woman) aged 37 to 72 are given in Table I. All patients had acute myocardial infarction and all were treated in the coronary care unit, sometimes before and always after their cardiac arrest. The initial cardiac arrest occurred in the coronary care unit in 12 instances, in the ambulance or casualty department in seven, and once in the general medical ward. Seven of the 20 patients had more than one episode (2-10) of cardiac arrest. The same medical team was responsible for both cardiac resuscitation and care in the coronary care unit.

The initial management of the cardiac arrest was by closed chest cardiac massage and mouth-to-mouth ventilation. This was followed as soon as possible by intravenous cannulation and by endotracheal intubation and assisted ventilation with oxygen in 16 patients and D.C. shock for ventricular fibrillation in 18 patients. Asystole was treated initially with intravenous isoprenaline, and six patients were later paced from a trans-

Cardiothoracic and Psychological Medicine Department, Central Middlesex Hospital, London N.W.10

M. DOBSON, B.A., Psychiatric Social Worker, Department of Psychological Medicine

A. E. TATTERSFIELD, M.D., M.R.C.P., Medical Registrar (Present address: Department of Medicine, Hammersmith Hospital, London W.12)

M. W. ADLER, M.B., M.R.C.P., Medical Registrar (Present address: Department of Social Medicine, St. Thomas's Hospital, London S.E.1)

M. W. McNICOL, F.R.C.P. (LOND., ED., GLASG.), Consultant Physician

TABLE I—Details of Cardiac Arrest

Case No.	Age	Time Between Infarction and C.A.	Total Duration of E.C.M. (min)	E.C.G. Rhythm	Other Procedure	Conscious State after C.A.
1	55	1 hour	20	V.F. AS.	Pacing	
2	51	4 hours	8	V.F.		
3	72	15 hours	12	AS.	Pacing	
4	62	24 hours	8	V.F.		
5	62	12 hours	3	V.F.		
6	50	1 hour	10	V.F.		
7	54	2 hours	4	V.F.		
8	48	2 hours	10	V.F.		
9	57	18 days	5	V.F.		
10	56	8 hours	3	V.F.		
11	65	3 hours	3	V.F.		Conf. 1 day
12	67	4 days	15	V.F. AS.	Pacing	Conf. 2 days
13	49	2 hours	25	V.F.		
14	64	36 hours	5	V.F.		
15	64	24 hours	15	V.F. AS.	Pacing	
16	62	7 days	30	V.F.		U 2 days
17	59	4 hours	2	AS.	Pacing	Conf. 2 days
18	63	1 hour	30	V.F.	I.P.P.R.	U 3 days
19	37	3 hours	3	V.F.		
20	67	8 days	5	V.F. AS.	Pacing	Conf. 4 days

E.C.M. = External cardiac massage. V.F. = Ventricular fibrillation. AS. = Asystole. C.A. = Cardiac arrest. I.P.P.R. = Intermittent positive-pressure respiration. U = Unconscious or semiconscious. Conf. = Confused.

venous pacing catheter. None of the patients were obviously conscious at the time of closed chest cardiac massage or at the time that D.C. shock was given. The endotracheal tube was removed in all but one patient as soon as a stable cardiac rhythm and spontaneous ventilation had returned, so that the need for sedation was avoided. One patient with a flail chest and pulmonary oedema after external cardiac massage for 30 minutes required positive-pressure ventilation via an endotracheal tube for three days. He received occasional sedation with diazepam and droperidol during this time. Muscle relaxants were not given.

The patients were not informed that a cardiac arrest had occurred, but were usually told when they regained consciousness that the heart had been a "bit irregular" or that the "blood supply to the brain had been temporarily reduced following the heart attack." The patient's wife or husband was contacted at this time and was usually seen by the physician attending the cardiac arrest. She or he was informed that a cardiac arrest or severe setback had occurred and she or he usually saw the patient for a short period at this time.

Methods

Twenty consecutive cardiac arrest survivors known to be alive six months or more after hospital discharge were contacted by letter and asked to participate in the study.

The patient and spouse were interviewed separately by the psychiatric social worker, the patient was seen by the physician, and then a joint discussion between the couple, the psychiatric social worker, and the physician followed. All of the patients were known to the physician and six had met the social worker during the course of a previous study in the coronary care unit (Dominian and Dobson, 1969).

The interview was basically unstructured and patients were not asked direct questions about their cardiac arrest unless it became apparent during the course of the discussion that they were fully aware that this had happened. Those who obviously were aware were then asked about their memory of the event and their attitude towards this experience. The spouses were encouraged to talk freely about the cardiac arrest. All of the patients were asked direct questions about: (1) return to work, (2) change in physical activity and social activity since their illness, and (3) mood and affective symptoms—depression, anxiety, sleep disturbance, irritability, energy. The spouses were asked direct questions about: (1) knowledge of and attitude to the patient's cardiac arrest, (2) their assessment of the effect of the illness on the patient, (3) their own response to the patient's illness, and (4) change in relationship within

the marriage. The patients were then asked to complete at home the Eysenck Personality Inventory and the Taylor Manifest Anxiety Scale.

Physical assessment included a brief interview, physical examination, chest x-ray examination, and electrocardiogram.

Recovery of Consciousness after Cardiac Arrest

Fourteen patients recovered consciousness rapidly after the restoration of sinus rhythm and, though often rather drowsy and bewildered at first, were soon able to talk and answer questions rationally; four were confused and disorientated for the first few days; and two were unconscious for two and three days respectively (Table II). One (Case 16) was unconscious for two days and was then confused, noisy, and belligerent for several days. He gradually became better orientated and less confused, and though slight residual intellectual impairment was obvious to both the staff and the patient's wife at the time of discharge, none was apparent when he was seen three months later. The other patient with prolonged unconsciousness (Case 18) was receiving sedation while being ventilated and it was therefore difficult to assess cerebral function. When the sedation was stopped after three days he remained slightly confused for several days but then appeared to make a full intellectual recovery.

TABLE II—Details obtained at Interview

Case No.	Time between Interview and C.A.	Period of Amnesia	Specific Memories of C.A.	Physical Condition at Time of Study
1	16 months	2 hours		A
2	12 months	—	People fighting	B
3	8 months	—	E.C.M.	B
4	13 months	—		A
5	12 months	3 hours		A
6	18 months	—	Extubation	A
7	9 months	1 hour	Cut down ankle	A
8	12 months	1 hour		B
9	12 months	—	Waking up on floor	A
10	24 months	P		A
11	6 months	P	E.C.M.	C + osteoarthritis
12	6 months	P	E.C.M.—overheard	A + diabetes
13	7 months	P	E.C.M.	C + hypertension
14	6 months	P		B + rheumatoid arthritis, D.V.T., and bedsores
15	10 months	4 days		C + diabetes
16	20 months	10 days		A
17	13 months	3 days	Pacing catheter in arm	B
18	17 months	14 days		B
19	8 months	2 days	E.C.M.	A
20	6 months	7 days		B + myasthenia gravis

A = No heart failure. B = Minimal heart failure. C = Moderate heart failure despite treatment. P = Patchy amnesia. D.V.T. = Deep vein thrombosis.

The two patients who were unconscious for the longest period of time were the two who had the longest periods of external cardiac massage (30 minutes each). The four patients who were confused did not have longer than average periods of cardiac massage (Table I) but all were aged 59 years or more.

Patients and Cardiac Arrest

KNOWLEDGE OF CARDIAC ARREST

Of the 20 patients, 16 were definitely aware that a cardiac arrest had occurred, two were not aware, and in two assessment was difficult—they either had no knowledge of the arrest or they did not wish to discuss it. Fourteen of the 16 patients who knew that a cardiac arrest had occurred were able to talk about it freely, though two had previously found it difficult to discuss at home. They appeared to understand fairly clearly what an arrest was; the descriptions commonly used were "heart stopping" (11 patients) and "dead—brought round" (4 patients). The means by which the patients had gained

knowledge of the arrest were: patient's gradual realization during hospital care in five cases, from medical staff in three cases, overheard in two cases, and from family (two after returning home) in six cases.

When asked whether further discussion with the medical staff would have been valuable, 12 patients thought that this would have relieved their anxiety considerably. Four of these pointed out that it would only have been helpful once they felt well on the road to recovery. Two patients felt that discussion at any stage would only have increased anxiety and two thought it would have made no difference.

RECOLLECTION OF CARDIAC ARREST

Nine of the patients had either no amnesia or amnesia of less than three hours' duration. These often remembered either the sensation of sinking into nothingness or of coming round to see several people by the bedside. Five had a patchy recollection of the first few days and often remembered specific episodes, such as external cardiac massage. Six patients had a period of complete amnesia lasting from 2 to 14 days. The complete amnesia usually dated from the cardiac arrest, though two patients (Cases 15 and 16) also had retrograde amnesia of 24 hours and 7 days respectively. The longest periods of complete amnesia (10 and 14 days) occurred in the two patients who were unconscious (two and three days) after the cardiac arrest. Two other patients with complete amnesia had been confused following the cardiac arrest.

Six patients remembered clearly the start and the end of the arrest. Descriptions included "going into nothingness," "fading out like lights," "feel forced to pull your mind back to your body," "as if your bones are rubber," and "suddenly feeling life flooding into you." One patient overheard a voice saying "My God, his heart has stopped" and remembers thinking that he could not be dead as he was still breathing.

The events and symptoms recollected by the patients are: external cardiac massage in 5, waking up on the floor in 1, removal of endotracheal tube in 1, new or different chest pain in 8, vomiting in 3, and visual disturbances in 2.

FEELINGS AND ATTITUDES TOWARDS CARDIAC ARREST

Once the patients were aware that a cardiac arrest had occurred the predominant feelings were:

Disbelief.—This was emphasized by patients who felt relatively well before and after the arrest, and who found it difficult to believe that they "had died in the middle."

Insecurity.—The suddenness of the episode and the absence of premonitory symptoms made the threat of death more real.

Bewilderment.—Patients who could not remember events clearly and particularly those with amnesia felt frustrated and anxious and found the disorientation in time disturbing.

Painlessness.—Despite the pain which often occurred after external cardiac massage most patients emphasized that it was "an easy way to go."

Closeness to Death.—Twelve patients had considered themselves to be near to death. Two said that the arrest had lessened their fear of death. No patient expressed any change in their religious belief because of this experience—one considered his atheistic beliefs were confirmed, "there is nothing there," and another considered his faith vindicated, "there seemed to be music and angels singing on the other side."

At the time of interview several patients showed marked ambivalence in their attitude towards the cardiac arrest, a sense of gratitude at still being alive, and simultaneously a sense of loss, uncertainty, and fear of recurrence. Five patients used such expressions as "I feel lucky to be living on borrowed time." One patient stated that this made life "more enjoyable" but another felt "life was ruined; you may as well accept you

have had it . . . never any more chance of doing piece-work and you are always regarded by others, especially your wife, as an invalid." The mixed feelings that prevailed were clearly expressed by one patient: "There is a feeling of disappointment . . . you were formerly strong and manly, now you are weak and have to think before you leap . . . at the same time it feels marvellous to think I am still here after what happened . . . it's a second time round."

Assessment at Time of Interview

PHYSICAL ASSESSMENT

Though 12 of the 20 patients had experienced some chest pain since the cardiac arrest, only two were considered to have true angina, two had had only one episode of chest pain, and eight had occasional non-specific pain variously described as "twinges," "feelings in the chest," and indigestion.

Ten of the 20 patients showed clinical and/or radiological evidence of cardiac failure. In seven of these the cardiac failure was considered to be mild and only one patient was receiving therapy for this. Three patients showed a moderate degree of cardiac failure and all were receiving digoxin and diuretic therapy. Six patients, five aged over 60, had concurrent illness. In four this was not severe—diabetes in two, essential hypertension in one, and osteoarthritis in one. More severe disability was present in one patient with myasthenia gravis and in one with a combination of rheumatoid arthritis, deep vein thrombosis, and a sacral pressure sore.

Twelve of the 15 patients who smoked cigarettes before the cardiac arrest had not resumed cigarette smoking at the time of interview.

RETURN TO WORK

Of the 18 patients who worked before the cardiac arrest seven had resumed employment within three months, 14 had returned to work by six months, and 16 by 18 months. Of the four who had not returned to work by six months, two had retired. Both were over 64 years and had other medical problems. Concurrent physical disability delayed the return to work in a third patient (Case 14) for eight months, while the fourth (Case 16), who was very anxious, was unable to cope with both the loss of his former employment and his impaired health and did not return to work for 18 months.

Ten patients initially returned to part-time work—four resumed full-time work within two months, and another four within the next four months. The two who continued part-time work were over the age of 65 years. Three patients who had been engaged in heavy manual occupations returned to different employment. The remainder returned to their normal occupations.

Social and Psychological Adjustment

On the basis of the patients' self-assessment, information from the spouse, and the impression gained by the psychiatric social worker the initial reaction and the long-term response to the illness were assessed.

Most patients experienced an initial increase in anxiety in the first few weeks after returning home. They were often aware that they would have died in hospital but for the availability of medical equipment and they were afraid that a further cardiac arrest might occur at home. Though this initial anxiety was found in all patients, it seemed to be more appropriate to the situation in those patients eventually making a satisfactory adjustment. There was more initial anxiety, often associated with feelings of panic in those patients who later made only a moderate or unsatisfactory adjustment. Six patients noticed

that dreams occurred more frequently during this period and in three these were often of a disturbing or violent nature.

During the first three months after hospital discharge the longer-term pattern of adjustment emerged and has been classified as satisfactory adjustment (5 patients), moderate adjustment (10 patients), and unsatisfactory adjustment (5 patients). The social, physical, and psychological features associated with these three categories of adjustment are shown in Table III.

Satisfactory Adjustment.—These five patients were functioning well within three months of the cardiac arrest with no undue curtailment of physical or social activity and little evidence of emotional disturbance or prolonged psychological symptoms. Self-confidence and energy were not reduced; indeed two patients considered they had more energy than previously.

TABLE III—Features Associated with Long-term Categories of Adjustment

	Total	Adjustment		
		Satisfactory*	Moderate	Unsatisfactory†
Category of adjustment	—	5	10	5
No. aged { 37-55 years	7	2	4	1
{ 56-72 years	13	3	6	4
No. in social class { I and II	5	3	1	1
{ III	10	1	7	2
{ IV and V	5	1	2	2
Factors surrounding C.A.:				
Mean duration E.C.M. (min)	10.8	10	10	13
Unconscious or confused (No.)	6	1	3	2
No amnesia (No.)	9	3	5	1
Patchy amnesia (No.)	5	1	3	1
Complete amnesia (No.)	6	1	2	3
Knowledge of C.A. (No.)	16	4	8	4
Able to discuss C.A. realistically (No.)	12	4	7	1
Features at time of interview:				
Heart failure { Mild (No.)	7	1	3	3
{ Moderate (No.)	3	—	2	1
Chest pain since C.A. (No.)	12	2	5	5
Concurrent medical problem (No.) ..	6	—	3	3
Mood disturbance:				
Depression (No.)	4	—	—	4
Anxiety (No.)	12	—	7	5
Psychotropic drugs since C.A. (No.) ..	7	—	4	3
Social factors:				
Marked decrease in physical activity (No.)	10	—	5	5
Marked decrease in social activity (No.)	5	—	2	3
Mean time for return to work (excl. retirement) (weeks)	20	11	13	42
Mean scores obtainable in personality questionnaire:				
Eysenck Personality Inventory†	9.8	5.0	10.5	13.2
Neurotic scale	12.5	12.5	12.8	12.2
Extrovert scale	13.4	6.9	13.8	19

*Cases 2, 7, 9, 10, and 18.

†Cases 6, 14, 15, 16, and 20.

‡Three patients in the moderate and one patient in the unsatisfactory adjustment group did not complete the questionnaire.

Moderate Adjustment.—In these 10 patients the anxiety, which had often been quite severe initially, had decreased markedly by three months but some symptoms were persisting to a greater or less extent at the time of interview. They complained of some degree of sleep disturbance (seven patients), loss of energy (six patients), and loss of self-esteem (five patients). Nevertheless, these patients had returned to work and had resumed many of their previous physical and social activities.

Unsatisfactory Adjustment.—Successful rehabilitation had not been achieved by five patients. They showed pronounced disturbance in mood, insomnia, irritability, loss of self-esteem, and reduced energy. Social and physical activity were curtailed and return to work was considerably delayed.

FACTORS ASSOCIATED WITH CATEGORIES OF ADJUSTMENT

There was no clear-cut relationship between the patients' long-term adjustment and the duration of external cardiac massage, or unconsciousness confusion, or amnesia following

the cardiac arrest. Poor long-term adjustment was associated with greater physical disability and with higher scores on the E.P.I. neurotic scale and the Taylor Manifest Anxiety scale. In the five patients who made the least satisfactory recovery concurrent physical illness seemed most important in two, a combination of physical disability and personality factors in two, and a very high level of anxiety in one who had no evidence of physical disability.

Spouse's View of Cardiac Arrest

Two patients were widowers and one was single. The spouses of the remaining 17 (16 wives and 1 husband) were seen. Thirteen of the spouses admitted to being aware that a cardiac arrest had occurred. Two were present when the arrest occurred, eight were informed by the hospital physician at the time, one was told by the general practitioner, one by her husband, and one guessed what had happened. All said that they preferred to know what had taken place and that the more information they received the less isolated they felt. Four spouses appeared not to be aware that a cardiac arrest had occurred. Three of these stated that they preferred not to know what was happening but liked "just to leave it to the doctor," suggesting they they may have needed to deny any information given them.

In eight instances husband and wife discussed fully the occurrence of the cardiac arrest after the husband's return home. This was felt to be natural and helpful initially, but the arrest tended to be rarely mentioned as time passed. Two wives considered that tension was increased because their husbands had never discussed their illness or arrest.

TABLE IV—Affective Symptoms Experienced by 16 Wives and One Husband

	Time after C.A.	
	First 4 Months	4 Months + 1
Depression	6	1
Anxiety	17	6
Psychosomatic symptoms	4	2
Sleep disturbance	10	5
Psychotropic medication	7	1

The spouses experienced considerable emotional stress at the time of the patient's illness and during his early convalescence at home (see Table IV). This was due to the realization of the nearness of the loss of the husband, to the uncertainty about his future survival, and to the stress of coping with the patient's reaction and adaptation after his discharge from hospital.

SPOUSE'S IMPRESSION OF EFFECT OF ILLNESS ON PATIENT

Most of the spouses (14 out of 17) emphasized the increased level of the patient's anxiety and reduction in self-confidence in the first three months after discharge from hospital. Many of the patients were said to be fearful of being alone—"he even follows me to the toilet" or "he watches me from the window when I go out shopping." Three husbands complained of pain constantly during the first two months at home and demanded that their wives arranged readmission to hospital. This was not considered to be necessary by the general practitioner. Most of the wives felt that their husband's anxiety gradually decreased; at the time of interview 10 considered their husbands to have recuperated well and seven felt their husbands had not regained their previous level of emotional adjustment.

EFFECT ON MARITAL RELATIONSHIP

Nine spouses found themselves at a loss at times to know how to treat their husbands during early convalescence. They found them both more dependent and more irritable, angry if fussed over or excessively protected, but accusing their wives of being unsympathetic if not given a good deal of attention. Three wives overcame these problems easily but six wives who were more anxious felt unable to express their own needs or aggressive feelings in case this had a detrimental effect on the husband. Two of the six wives considered that this control over their own anger and the increased recognition of their husband's needs improved their relationship.

In four cases problems in the marital relationship resulted. In two instances there was evidence of pre-existing marital tension which increased after the patient's illness. In the other two cases the husbands' increased anxiety prevented them from giving the support they usually provided. All four spouses had considerable difficulty in tolerating the mixture of dependency and hostility directed towards them.

The effect of the illness on the frequency of sexual intercourse in the 17 married patients is shown in Table V. Twelve couples had had regular intercourse before the cardiac arrest; the frequency was reduced following the illness in six instances and there was a complete cessation in a further two instances. This was mainly attributed to apprehension on the part of the patient and particularly the spouse about the safety of sexual intercourse. The patient who resumed more frequent sexual activity described himself as being rather depressed and apathetic for some months before his illness.

TABLE V—Effect of the Illness on Sexual Relationships

Frequency of Sexual Intercourse						
None before illness	..	..	..	..	..	5 patients
Stopped completely after illness	..	..	..	..	..	2 patients
Less frequently	..	..	..	..	..	6 patients
No change	..	..	..	..	..	3 patients
Increased frequency	..	..	..	..	..	1 patient

Discussion

This paper describes the initial response and long-term adjustment of cardiac arrest survivors, based primarily on their own statements and those of their wives. All 20 patients approached agreed to participate, and we believe that the findings are representative of patients with myocardial infarction surviving a cardiac arrest.

Most patients and their spouses seemed very ready to discuss their memories and fears about the cardiac arrest. An experience as frightening as a cardiac arrest may result in the patient's need to deny the event, its implications, and the fears aroused. Our patients were able to remember and discuss events and emotions connected with the cardiac arrest to a greater extent than previously reported (Druss and Kornfeld, 1967; Hackett *et al.*, 1968), perhaps because they knew the physician who had been responsible for their care in hospital and they accepted the interview and especially the medical examination as important means of gaining reassurance about their physical condition.

The results show that though most patients had not been specifically informed that a cardiac arrest had occurred, 16 out of 20 realized that it had. Several patients remembered specific events such as external cardiac massage and were quite clearly more aware of this experience than the medical staff realized. This point was emphasized in the personal experience reported by a doctor (*Lancet*, 1969). Both he and the patients in the recent study attached particular value to close contact and communication with the medical and nursing personnel during the critical phase of their illness. A simple explanation of what has happened may be necessary when the patient regains consciousness, in the knowledge that he may remember receiving external cardiac massage or may have overheard inadvertent conversation. The primary need at this time

though is for encouragement and comfort. Detailed explanation is often meaningless and may even provoke anxiety.

NEED FOR DISCUSSION

Our findings suggest that when the patient is recovering the physician should be prepared to discuss and explain the nature of a cardiac arrest. This will allay anxiety in patients who are aware of the event and who may be unduly pessimistic about their future. Patients are particularly apprehensive that the cardiac arrest may recur and about the safety of resuming their usual activities after hospital discharge. They may attach increasing importance to the event if they consider the physician to be unwilling to discuss it with them. The evidence from studies of myocardial infarction suggest that the prognosis of patients leaving hospital after one or more episodes of cardiac resuscitation is not significantly different from the prognosis of patients not having had a cardiac arrest (Lawrie, 1969; McNamee *et al.*, 1970). The physician can therefore discuss the cardiac arrest realistically with the patient about to leave hospital.

Most patients would have appreciated further discussion with the medical staff, and on the whole patients who were able to talk about the cardiac arrest realistically made better long-term adjustments. It is not possible to say whether more explanation and discussion between the patient, spouse, and medical staff would have significantly affected long-term rehabilitation. Our impression is that this would have been beneficial, particularly to the patients in the moderate adjustment group who were often very anxious in the initial period after hospital discharge. A minority of patients are unable to face the implications of a cardiac arrest and need to deny that this has occurred. It is not usually difficult to recognize these patients by their unnaturally cheerful façade, and even if told these patients may repress the information. Some patients who face the implications of the cardiac arrest and their illness at an early stage may experience pronounced depressive feelings while in hospital. However, both patients in our study who particularly emphasized this early depression made satisfactory long-term adjustments.

It is difficult to separate the patients' response to the cardiac arrest from the experience of admission to hospital, intensive care, and severe illness. The literature describing patients' reactions to myocardial infarction is extensive (Hellerstein and Ford, 1960; Seldon, 1963), and the emotional problems engendered are similar in many respects to those seen in the present study. However, the suddenness and uniqueness of the cardiac arrest episode does emphasize the possibility of death in myocardial infarction, and we believe that this can lead to a considerable increase in anxiety in some patients.

LONG-TERM PROBLEMS

Most patients did have some long-term problems following the cardiac arrest, but this study has shown that satisfactory social and psychological adjustment after cardiac arrest can be achieved. Few previous studies have considered emotional disturbances following cardiac arrest. In studies primarily concerned with physical prognosis (Dupont *et al.*, 1969; McNamee *et al.*, 1970) serious emotional sequelae were thought to be rare. This contrasts, however, with Druss and Kornfeld (1967) who, in a more detailed psychiatric assessment, considered all their 10 patients to be suffering from pronounced long-term psychiatric disturbance, though in five patients their conclusions were based on an assessment only six weeks after the cardiac arrest. It may be that the atmosphere of the coronary care unit is of some importance, as the unit described by Druss and Kornfeld (1967) was one of "darkness and quiet," where patients "see, hear and smell the life and death struggle of the other human beings" and "there was little interaction

between patients." This contrasts markedly with the coronary care unit in this study which was a light, active room in which considerable interaction took place between patients and between patients and nursing and medical staff.

An attempt has been made to assess the factors influencing the patients long-term rehabilitation. Persisting physical disability and personality factors appear to be most closely related. It was apparent from the separate interviews with husband and wife that patients who had previously had difficulty in coping with stress were those who found the cardiac arrest most threatening. Rehabilitation did not appear to be significantly influenced by factors related to the cardiac arrest, such as the duration of external cardiac massage or the duration of impaired consciousness following the arrest. Intellectual impairment, as judged by the spouse, was present in one patient at the time of discharge but was not found at the time of interview, supporting the view of previous authors (Dupont *et al.*, 1969; McNamee *et al.*, 1970) that this is an infrequent problem in patients surviving cardiac resuscitation.

The spouses particularly appreciated the opportunity given by the research interview to discuss their fears about the cardiac arrest and their husband's present health. The most prevalent and continual anxiety was that of recurrence of the cardiac arrest, and this resulted in several spouses being over-protective and restrictive about physical activities. Their efforts were concentrated on not upsetting the patient—"then I won't have any reason to feel guilty"—to the detriment of their own and their husbands' emotional well-being. Careful explanation and discussion with the spouse is necessary if they are to provide the support and encouragement required by the patient in the period after hospital discharge. Several wives felt that it would have been helpful to have had a further discussion with the physician before the patients' discharge and at the follow-up appointments if particular problems arose.

The occurrence of a cardiac arrest and the intensive care which followed led, in some patients, to feelings of dependency on the hospital. Initial follow-up outpatient visits often helped to reassure the patients and increase their self-confidence. Repeated outpatient visits, however, may lead to further unhelpful dependency on the hospital. A careful balance must therefore be sought so that the patient can be reassured at a suitable time that continuous hospital supervision is not necessary. In the absence of particular physical or severe psychological problems it would seem to be most helpful for the patient and if possible the spouse to be seen at least once fairly soon after discharge (one to two weeks) and perhaps again at two to three months to consider any problems related to their return to work. Long-term support may be required by some patients and by some spouses. This is probably best given by the general practitioner rather than the hospital.

We would like to thank the physicians and nursing staff concerned with the care of the patients and Dr. J. Dominion for his advice. M.D. and M.W.A. were receiving a research grant from the Ministry of Health and A.E.T. and M.W. McN. were receiving grants from the Medical Research Council.

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Testosterone Therapy for Anaemia in Maintenance Dialysis

STANLEY SHALDON, KARL M. KOCH, FRITZ OPPERMANN, WOLF D. PATYNA,
 WILLIAM SCHOEPPE

British Medical Journal, 1971, 3, 212-214

Summary

Intramuscular testosterone 250-500 mg weekly given to 25 patients on long-term haemodialysis produced a significant rise in haemoglobin level in all patients. The response was reversible when the drug was stopped. Treatment was effective in bilaterally nephrectomized patients and those with intact kidney tissue. The use of intramuscular testosterone is recommended for all adult patients on long-term haemodialysis in order to eliminate the need for routine blood transfusions.

National Kidney Centre, London, N.3
 STANLEY SHALDON, M.D., M.R.C.P., Medical Director

Department of Nephrology, Centre of Internal Medicine, University of Frankfurt, Frankfurt

KARL M. KOCH, M.D., Privat-dozent
 FRITZ OPPERMANN, M.D., Resident
 WOLF D. PATYNA, M.D., Resident
 WILLIAM SCHOEPPE, M.D., Privat-dozent

Introduction

The anaemia associated with long-term haemodialysis still remains one of the relatively unsolved problems of this treatment. Since 1965 it has been possible to avoid routine blood transfusions in most dialysis patients (Shaldon, 1966) though the mean P.C.V. remains at 20% (Verroust *et al.*, 1967). When patients thus treated have not previously received multiple blood transfusions they become iron-deficient from the repetitive blood loss associated with haemodialysis (Lawson *et al.*, 1968), and a significant rise in haemoglobin levels has been reported with parenteral iron supplements (Comty *et al.*, 1966; Crockett *et al.*, 1967; Wright *et al.*, 1968; Eschbach *et al.*, 1970). However, in spite of the hazards of hepatitis and increased transplant rejection rates associated with multiple blood transfusions (Parsons and Clark, 1969) only 10% of haemodialysis patients were maintained on a non-transfusion policy in Europe in 1969 (Druckker *et al.*, 1969).

Experimental evidence has suggested that androgens exert significant effects on erythropoiesis (Mirand *et al.*, 1965; Fried and Gurney, 1968; Gordon *et al.*, 1968). They have been used in a variety of refractory anaemias with widely varying responses. The most impressive clinical use has been in idiopathic aplastic anaemias of children (Shahidi and Dia-