

Anxiety after a heart attack

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An objective measurement of anxiety at defined intervals after the onset of acute cardiac symptoms was made in 203 men admitted to the Coronary Care Unit, Royal Infirmary of Edinburgh, and in 83 patients in a Teesside coronary survey. Of the Teesside patients, 50 were treated at home, 22 were admitted initially to a coronary care unit, and 11 were admitted directly to a general medical ward.

In the Edinburgh patients the level of anxiety was high early in the illness, fell rapidly, and rose again towards the end of their stay in hospital. At 4 months it was that of a normal population. After transfer from the coronary care unit the group was not more anxious than other patients in the ward. Reaction to the illness was unrelated to its physical severity. Patients who reacted badly at the beginning were less likely to return to work.

The pattern of anxiety in the Teesside patients resembled that of the Edinburgh group, and reaction to illness was largely independent of physical aspects. Treatment in hospital, either through a coronary care unit initially or in a medical ward, did not increase emotional distress. At 3 months patients treated initially in a coronary care unit were less anxious than the others. Throughout the period of study the Teesside patients were more anxious than the Edinburgh patients and outcome was not related to anxiety. Social and environmental differences may account for this.

An increasing number of patients with acute ischaemic heart disease are treated at the beginning of their illness in coronary care units. The physical benefits of continuous monitoring, early treatment of dangerous arrhythmias, and intensive care by highly trained staff have been discussed (Lawrie *et al.*, 1967), as have been the possible adverse psychological effects on the patient of such an environment and of subsequent transfer to open wards (Hackett, Cassem, and Wishnie, 1968; Dominian and Dobson, 1969). Rehabilitation may fail for psychological as well as physical reasons (Nagle, Gangola, and Picton-Robertson, 1971; Cay *et al.*, 1973), so it is important that treatment of the acute attack should not increase emotional disturbance.

This paper presents the results of two studies of anxiety in patients after a heart attack. The first group (group A) comprised 203 men admitted consecutively to the Coronary Care Unit of the Royal Infirmary, Edinburgh—a six-roomed purpose-built unit. Anxiety at defined intervals was measured and related to the physical diagnosis, severity of the

attack, and outcome of treatment. At the same time an epidemiological survey of the incidence, mortality, and outcome in all cases of ischaemic heart disease in Teesside County Borough (now part of Cleveland County) was being carried out by a combined medical team. The opportunity was taken to measure anxiety in 83 consecutive cases (group B) by the same method and at much the same time intervals as in the Edinburgh study. Of the Teesside patients, 50 were treated at home by their general practitioner, 22 were admitted initially to a coronary care unit, and the remaining 11 were admitted directly to a general hospital ward.

The purpose of the study was to examine anxiety after a heart attack in the two very different populations and to relate this to the varying methods of treatment.

Method

Anxiety was tested by the Cattell 8-Parallel-Form Anxiety Battery (Scheier and Cattell, 1960). Each of the 8 forms of the battery consists of 7 brief, distinct subtests disguised in purpose and arranged

TABLE 1 *Measurement of anxiety in two groups*

Patient group		Time of testing					
		4th day	7th day	10th day	—	—	4 months
Group A (Edinburgh)	Within 24 hours of transfer from coronary care unit to ward	4th day	7th day	10th day	—	—	4 months
Group B (Teesside)	Within 24 hours of notification of case to survey team	4th day	—	—	1 month	3 months	—

in a pencil and paper format. The battery facilitates repeated measurements of anxiety, with brief intervals between assessments, since all raw scores are transformed into standard scores with norms set at 5.5. The reliability of the forms has been tested and retested and found to be satisfactory (Philip, 1970) and British norms are available (Philip, 1972). Other considerations influenced the decision to measure anxiety by questionnaire and, in particular, by this test. It was thought inappropriate to use physiological indices of anxiety such as heart rate and blood pressure, which in these patients are likely to be related to physical state. The short, non-stressful nature of the test permitted testing to be carried out early in the illness and specialist personnel were not required to administer it. Table 1 details the time intervals of measurement in the two groups. These are not precisely the same because the time of testing had to be incorporated into the framework already in operation in the Teesside survey (Teesside Coronary Survey Report, personal communication).

The patients in group A were divided into those with definite myocardial infarction on the evidence of the electrocardiographic and biochemical tests, and those presumed to have myocardial ischaemia. The physical severity of the heart attack was calculated from coronary care unit data by means of the prognostic index described by Peel *et al.* (1962), which scores various factors in the previous history and clinical examination. The higher the total score the worse the patient's prognosis. The Teesside patients were classified as 'definite', 'possible', and 'not' cases of myocardial infarction by reference to a combination of historical, electrocardiographic, and biochemical criteria by 4 specially-trained nurses who also performed the tests of anxiety. It appeared that those classified as definite cases of myocardial infarction in the two groups were comparable and that the Edinburgh 'ischaemics' were equivalent to the Teesside 'possibles'.

Results

General characteristics of study groups

The ages of the 203 Edinburgh patients ranged from 16 to 79 years, with a mean of 55 years. Myocardial infarct was confirmed in 131 (65%), 101 (50%) being seen after their first major attack. Of those without myocardial infarction (the ischaemic group) 45 (22%) had no history of a previous myocardial infarction and 27 (13%) had such a history. On average, the infarct patients stayed 20 days in hospital and the ischaemic patients 12 days. Twelve patients died in hospital after transfer from the coronary care unit and 11 died within four months of discharge.

Of the 83 Teesside patients, 41 (49%) were classified as having a definite myocardial infarct, 26 (32%) as being possible myocardial infarction while 16 (19%) did not have an infarct. The diagnosis in the different treatment groups and the ages of the patients are shown in Table 2. As might be expected, more patients admitted to hospital, especially those sent into the coronary care unit, had a definite myocardial infarct than those treated at home. Age did not appear to affect the decision whether to treat at home or send into hospital.

TABLE 2 *Physical diagnosis and age of 83 Teesside patients related to method of treatment*

	Method of treatment		
	Treated at home	Treated in hospital ward	Treated initially in coronary care unit
No. of patients	50	11	22
<i>Diagnosis</i>			
Definite MI	15 (30%)	8 (73%)	18 (82%)
Possible MI	19 (38%)	3 (27%)	4 (18%)
Not MI	16 (32%)	—	—
<i>Age (y)</i>			
Range	29-69	30-68	37-67
Mean	53.4	56.0	52.4

TABLE 3 Anxiety scores in 203 Edinburgh patients (Group A)

Time of testing	Myocardial infarct patients (131)		Ischaemic patients (72)		Total group (203)	
	No. tested	Mean score	No. tested	Mean score	No. tested	Mean score
Day 1	111	6.4	61	6.5	172	6.4
Day 4	113	4.9	52	5.3	165	5.0
Day 7	107	4.9	38	4.5	145	4.8
Day 10	102	5.2	25	5.2	127	5.2
Four months after discharge	89	4.4	42	4.7	131	4.5

Mean scores for normals set at 5.5.

Measurement of anxiety (group A)

On the day after their transfer from the coronary care unit 172 (85%) patients were judged physically fit to complete the questionnaire. Table 3 details the test scores during the first 10 days of convalescence in the ward. The decrease in the number who completed the later tests was largely because many of the ischaemic patients were discharged early. Of the 12 patients who died in the ward 10 had had a myocardial infarct on admission, and this also decreased the number tested. The patients' level of anxiety was high immediately after transfer from the coronary care unit and then fell quite rapidly over the next week, rising again as discharge from hospital became nearer. Not surprisingly, immediately after their heart attacks they were more anxious than normal but they quickly settled in the ward, approaching normal anxiety levels again towards the end of their hospital stay. They were not, however, significantly more anxious than their fellow patients in the ward; the mean scores of those admitted directly to the ward as medical emergencies was 5.8.

The close similarity between the myocardial infarct and ischaemic patients in their level of anxiety suggests that the individual's reaction to his heart attack bears little relation to its physical severity. This was confirmed by the calculation of the correlations between the anxiety scores and the Peel Index (Table 4)

TABLE 4 Correlation between level of anxiety and physical severity of heart attack (group A)

Physical severity	Anxiety				
	Day 1	Day 4	Day 7	Day 10	Four months after discharge
Peel index	r=-0.02 NS	r=-0.01 NS	r=0.03 NS	r=0.08 NS	r=-0.2 P<0.01

Four months later the 180 survivors were recalled to a follow-up clinic: 166 (92%) attended and 131 completed anxiety questionnaires. The patients were less anxious (Table 3) than they had been in the ward and the group on the whole had lower scores than normal. Interestingly enough, when anxiety was correlated with the physical severity of their heart attack four months previously anxiety was higher in those who had been less physically ill (Table 4).

On admission to the coronary care unit, 154 (76%) patients were working, 14 (7%) were unemployed, and 30 (15%) had already retired. Four months after discharge 94 patients (69% of those working on admission) were back at work—85 of them in their previous jobs, though considerable adjustments to lighten the work load had been made in 33 cases. The activity at work of the 154 who were working on admission was graded to take into account such changes in employment and adjustments to previous jobs (Table 5) and related to the patient's level of anxiety just after transfer from the coronary care unit. Patients who had reacted badly at the beginning of their illness were less likely to be

TABLE 5 Activity at work at 4 months related to anxiety immediately after transfer from coronary care unit (group A)

Activity at work at four months	Anxiety score immediately after transfer from coronary care unit (mean score)
Fully active in same or comparable job	5.9
Not fully active in same or comparable job	6.7
Less demanding job	7.0
Retired—not because of age	7.0
Not yet back at work	6.5

TABLE 6 *Anxiety scores in 83 Teesside patients (group B)*

<i>Time of testing</i>	<i>Patients in coronary care unit initially (22)</i> <i>Mean score</i>	<i>Patients admitted to hospital ward (11)</i> <i>Mean score</i>	<i>Patients treated at home (50)</i> <i>Mean score</i>
Day 1	6.9	7.4	6.9
Day 4	6.3	6.3	6.2
One month after onset	6.8	6.9	6.4
Three months after onset	5.9	6.6	6.3

working within four months and, if working, to be back to their previous level of activity. When it is recalled that anxious patients had not necessarily had more severe heart attacks than the others it suggests that anxiety hinders successful rehabilitation.

Measurement of anxiety (group B)

Table 6 shows the results in the Teesside patients. The pattern of anxiety after the heart attack was similar whether the patient was admitted to a coronary care unit, directly to the hospital ward, or treated at home—an initial high level falling during the first few days of illness, rising again at one month, and finally dropping once more three months after the onset of illness. There was no significant difference in anxiety at the beginning of their illness in the three different treatment groups. Only in those treated initially in the coronary care unit was anxiety lower at three months than on the third day of their illness. The single point at which the profiles showed a significant difference was when the drop in anxiety between 1 month and 3 months was compared; patients treated initially in the coronary care unit became less anxious over this time than those treated at home. An unexpected finding was that the Teesside patients, though they had much the same pattern of anxiety after their heart attacks, were more anxious than the Edinburgh patients at every test. Also their mean anxiety level was always above that of a normal population.

Fewer patients in the group treated at home had had a myocardial infarct compared with those admitted to hospital. Anxiety in the 34 patients with definite or possible myocardial infarcts who stayed at home was examined separately. On each occasion of testing the level of anxiety in the infarct patients was marginally higher than in those treated at home whose initial diagnosis was not confirmed (Table 7). If anything, patients with definite or possible myocardial infarcts at home appeared more anxious than those admitted to the coronary care unit, but the differences were not significant.

Anxiety was then correlated with a number of variables measured in the survey, such as personal details, past history, and clinical and biochemical assessments of the patient's physical state immediately after the beginning of his illness and one month later. There was no significant association between those variables and the patient's reaction to his illness apart from a weak relation between the serum hydroxybutyrate dehydrogenase enzyme level at the beginning of illness and the patient's initial anxiety score.

To try to find out why anxiety decreased in the group treated in a coronary care unit between one month and three months after their illness two factors were examined in these patients which might well have had a bearing on their level of anxiety—routine hospital follow-up and the extent of rehabilitation. There was no difference between the coronary care unit group and the ward group in their follow-up appointments, 75 per cent of both groups being seen routinely at the hospital. The mobility at one month of the patients diagnosed as having a definite or possible myocardial infarct is shown in Table 8. At this stage, though the mean anxiety scores in the three treatment groups were practically the same, their progress was very different, the coronary care unit patients being the least mobile.

The results of a questionnaire sent at 3 months to a random sample of 200 patients in the Teesside

TABLE 7 *Anxiety in patients with definite or possible myocardial infarction treated at home (group B)*

	<i>Definite myocardial infarction</i>	<i>Possible myocardial infarction</i>
Day 1	7.0	6.3
Day 4	6.4	5.8
1 month	6.7	6.0
3 months	6.5	6.2

TABLE 8 *Mobility at one month of Teesside patients with definite or possible myocardial infarction (group B)*

<i>Mobility at 1 month</i>	<i>Patients treated at home (34)</i>	<i>Patients treated in hospital ward (11)</i>	<i>Patients treated initially in coronary care unit (22)</i>
In bed	2 (6%)	—	—
Up but not ambulant	11 (32%)	2 (18%)	14 (64%)
Ambulant but housebound	11 (32%)	9 (82%)	8 (36%)
Ambulant, not housebound	7 (21%)	—	—
Missing data	3 (9%)	—	—
Mean anxiety score at one month	6.7	6.6	6.8

survey showed that return to work was not related to the method of treatment of the acute attack, except that hospital-treated patients were more likely to return to work without any restrictions.

Discussion

The results of the Edinburgh study suggested that the individual's reaction to a heart attack was not related to the physical diagnosis or to the severity of illness. However, successful outcome of treatment, in terms of the patient's ability to earn a living afterwards, was associated with the level of anxiety in the first few days after the attack. Patients who had reacted badly at this stage were likely to do less well. Thus the effect on morale of treatment in a coronary care unit was relevant to subsequent rehabilitation. Of the 203 patients, 83 per cent said they had been reassured by intensive care (Cay *et al.*, 1972). This together with their low level of anxiety within a few days of transfer from the unit and the finding that they were not more anxious than other patients in the ward suggested that admission to a coronary care unit had not upset them, but in the absence of a control group this remained only an inference.

The Teesside group presented an opportunity to examine patients treated in three different ways. Since the survey was concerned with examining current practice in the area there was no reason to suspect that the general practitioner's decision to admit his patient to hospital or not was affected by the survey. The evidence from the Teesside patients shows that admission to hospital, either to a coronary care unit or directly into a ward, does not further upset patients with a heart attack. Like the Edinburgh patients, their reaction to the illness was largely independent of its physical aspects. The place and kind of treatment does not play a significant role either, provided that the patient derives reassurance and encouragement from the setting.

The data from the present two studies do not explain the higher anxiety in the Teesside patients. There was no difference in the method of testing, and the discrepancies in the time of testing, which could not be overcome, could have played only a small part. It is interesting to speculate that the environmental differences between the two populations may be a factor. The Teesside patients were from a heavily industrialized area while many in the Edinburgh group were in sedentary occupations or employed in light industry, so that returning to work was feasible—indeed, nearly all returned to their previous employment.

In Edinburgh the outcome of treatment was related to anxiety. This was not found in the Teesside patients, where the differing amounts of mobility achieved by one month in those treated in the coronary care unit initially, in hospital, or at home were not reflected in differences in their level of anxiety. Though the coronary care unit patients were less anxious, return to work at three months was unrelated to the method of treatment of the acute attack. Again, the whole question of local social and environmental factors may have to be considered.

Taken together, the results of the two studies are clear. There is no evidence that admission to hospital and, in particular, to a coronary care unit increased emotional disturbance in these patients.

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