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Anxiety, depression and myocardial infarction: a survey of their impact on consultation rates before and after an acute primary episode

A study conducted by questionnaire showed that a substantial minority of patients had clinical or borderline clinical anxiety and depression post-MI.

Abstract

The study documents general practitioner (GP) consultations before and after a primary, acute myocardial infarction (MI) and examines how these relate to psychological distress. Data were derived from the numbers and category of consultations and their outcome, documented from medical records of 194 patients with a primary acute MI over a two-year period pre-MI and a six-month period post-MI. Objective measures of anxiety and depression were collated using the Hospital Anxiety and Depression Scale in four phased assessments over a six-month period following the MI.

There was a high probability of consultation for cardiovascular and psychological symptoms before a MI. Post-MI, almost all patients receive an early consultation: high consultation rates continue for cardiovascular concerns but they are relatively low for psychological issues. However, questionnaire responses indicated a substantial minority of patients with clinical or borderline clinical levels of anxiety (30%) and depression (20%) post-MI.

Patients are willing and able to make demands on their GPs post-MI, but not for psychological issues despite evidence of high levels of anxiety and depression; patients may be too accepting of distress. While GPs advise and are prepared to provide drug treatment for psychological concerns, they did not make referral for psychological support.

Key words: myocardial infarction, depression, anxiety, primary care, consultation rates.

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Introduction

Negative emotional states are common following a myocardial infarction (MI). As many as 56% of patients suffer anxiety in hospital[1] and 20% show evidence of major depression in the immediate post MI period.[2] Distress may be even greater than this since denial is a common coping strategy.[3] Depression may affect subsequent reinfarction rates over the short[4] and longer term.[5] Such distress has been documented in women as well as men[6] and older as well as younger patients.[7] Studies focus on depression[8] but similar outcomes are reported for anxiety.[9] Depression may predict primary as well as secondary coronary events,[10] raising the issue of whether post-MI depression and subsequent negative coronary outcomes reflect pre-MI status. However, evidence indicates depression that develops post-MI may be more important.[11]

> *The majority of MI patients present with chest pains or cardiovascular symptoms in the two years before their infarct*

Anxiety and depression impact on patients' ability to cope[12] but the majority of UK patients receive little structured help with distress in hospital. On discharge, they may be referred to a cardiac rehabilitation programme, but the likelihood of there being an available psychologist is small. The patient's first contact with medical services following a MI is usually with the general practitioner (GP). It has been suggested that for 45% of patients, depression post-discharge would fall within the remit of GP intervention.[13] However, we have little indication of the demands that these affective states make on the primary care sector or how they are addressed, despite National Health Service statements in the National Service Frameworks and from the National Institute for Health and Clinical Excellence that there should be a positive response.[14,15]

Methods

To document affective status, a questionnaire assessing mental health status was completed prospectively and longitudinally in hospital post-MI and at three time points over the subsequent six-month period. To provide perspective on the relationship between pre- and post-MI affective status and the impact of psychological issues relative

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Table 1. Breakdown of pre-MI consultations for chronic illness, cardiovascular issues and psychological issues

Chronic illness (47% of patients made a consultation in this category)	
Asthma/COPD	11%
Diabetes	20%
Orthopaedic problems	26%
Other	43%
Cardiovascular disease (67% of patients made a consultation in this category)	
Chest pain	34%
Angina	24%
Ischaemia	16%
Blood pressure	26%
Psychological problems (27% of patients made a consultation in this category)	
Anxiety	31%
Depression	44%
Other	25%

Key: MI = myocardial infarction; COPD = chronic obstructive pulmonary disease

to other health concerns, data were collected on GP consultations over two years before the primary MI and six months post-MI.

Participants

Patients with a confirmed primary coronary episode were recruited over an 18-month period at one hospital on Wirral. Patients were excluded if there was evidence of cognitive impairment, a recent history of mental illness or if there was other, potentially fatal illness. The sample comprised 194 patients (males = 148) with a mean age of 64 years (range 37–86 years). As part of the treatment pathway, all patients were referred to out-patient cardiac rehabilitation commencing four weeks after the coronary episode. The programme comprised eight two-hour sessions, one per week for eight weeks, of education and exercise sessions typical of UK rehabilitation programmes.[16]

Materials

Information on the number of medical appointments, their venue, together with treatment and referrals, was collated from primary care records for each patient. Each consultation record was coded according to reference to five categories: cardiac-related problems, psychological problems, chronic illness, acute illness and 'other reasons'. Cardiac-related consultations were divided into: angina, ischaemia, blood pressure (BP) or 'other' chest pains (e.g. muscular or gastric pains). Psychological consultations were coded: anxiety, depression and 'other problems' not clearly diagnosed as anxiety or depression. For each category, the treatment outcome was coded as drug treatment or advice or referral. A distinction was made for new or repeat prescription, but without detailing the specific drug.

The Hospital Anxiety and Depression Scale (HADS) was used to assess mood status.[17] It comprises 14 items split into two sub-scales for anxiety and depression. Each item is scored 0–3, and the threshold score for clinical case status is > 10, with scores from 8–10 indicating borderline clinical status.

The questionnaire was given at four time points. *Time 1* was in hospital, three to four days following MI. *Time 2* was one month following the episode, at commencement of the out-patient rehabilitation programme. *Time 3* was three months following the coronary episode, at the end of the out-patient programme. *Time 4* was six months post-episode. At *Time 1,* questionnaires were completed with a psychologist, at *Time 2* by a rehabilitation nurse; subsequently they were completed by the patient at home and returned by prepaid post.

Results

Pre-MI period

Overall, 103 patients (67%) had consultations relating to cardiac issues, 35 (18%) had consultations relating to acute illness, 91 (47%) for chronic illness and 52 (27%) with psychological issues, and 33 (17%) in the 'other' category. The categorisation of consultations for chronic illness, cardiovascular disease and psychological problems is summarised in table 1. The range was 0–10 consultations, with the exception of four patients outside this range. Sixteen percent of patients made no consultations and a further 16.5% a single consultation. The outcome of additional consultations was: 12% received repeat prescriptions, 22% new prescriptions (mainly for different conditions), 52% received advice on management and 14% underwent further investigations.

> 'Anxiety was predominant post-MI, in contrast to depression pre-MI'

Fifty-two patients (27%) consulted for psychological reasons: numbers ranged from 1 to 9 consultations, with the majority (and mode) making a single consultation. Problems included anxiety, agitation, depression, insomnia, stress and mood swings, with depression providing the largest portion (44%). Thirty-four patients (65%) were prescribed a psychoactive drug: 35% of these an anxiolytic and 65% an antidepressant, the latter reflecting the predominant reason for the consultation.

With respect to psychological prob-

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Table 2. Number of patients consulting for psychological issues in the six-month period post-MI

		Total patient sample (n=194)
Number of patients reporting psychological problems		19 (10%)
Psychological problems	Anxiety	8 (4%)
	Depression	6 (3%)
	Other	5 (2.5%)
Drug prescribed	Anxiolytic	6 (3%)
	Antidepressant	5 (2.5%)
Treatment outcome	New prescription	9 (4.5%)
	Repeat prescription	2 (2%)
	Advice	8 (4%)
	Referral	0

Key: MI = myocardial infarction

Table 3. Number of patients presenting as clinical or borderline clinical case status on the basis of the Hospital Anxiety and Depression Scale (HADS) responses post myocardial infarction. Percentage figures relate to patients completing the scales

		Anxiety		Depression	
		n	%	n	%
Hospital baseline	Non-case	128	66	169	86
	Borderline case	37	19	16	8
	Clinical case	29	15	9	5
	Missing scores	0	0	0	0
One month post-MI	Non-case	95	64.5	112	75
	Borderline case	24	16	25	17
	Clinical case	29	9.5	12	8
	Missing scores	46	24	45	23
Three months post-MI	Non-case	72	60	98	78
	Borderline case	28	23	17	14
	Clinical case	21	17	8	8
	Missing scores	73	38	71	37
Six months post-MI	Non-case	77	67.5	92	80
	Borderline case	21	18.5	12	10
	Clinical case	16	14	12	10
	Missing scores	80	41	78	40

Non-case = HADS scores < 8
Borderline case = HADS scores 8–10
Clinical case = HADS scores ≥ 11

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lems, females made more consultations than males (chi² $p<0.01$), but the correlation between age and number of consultations, though negative, was not significant ($r = -0.11$; $p>0.05$).

Post-MI period

A total of 187 (96%) patients were seen by their GP within a week of their coronary episode: 32 (17%) of these consultations took place in the patient's home.

The number of consultations post-MI ranged from 0–14. Only one patient exceeded this range, a patient who had a similar high consultation rate pre-MI. The overall mean consultation rate was 4.7 consultations, with the mode being one visit (in addition to the initial visit).

The number of cardiovascular consultations ranged between 0 and 14 for this period. The modal number was just one additional visit after the first week, with the mean number of consultations being 3.0.

The number of patients consulting primarily for psychological problems was below 10% (n=19). Drug treatment was prescribed for 58% (n=11) of these cases, 82% being a new prescription. Eight of these patients (42%) received advice. No patient was referred for further psychological assessment or treatment. These data are summarised in table 2.

All patients asked completed the HADS questionnaire in hospital but subsequent return rates fell over time: they were 76% at *Time 2*, and 59% at *Time 4*. No telephone or postal reminder on failure to return questionnaires was scheduled into the study. However, those failing to return questionnaires at each time point did not differ significantly in terms of anxiety or depression score at baseline (t-tests; all $p>0.05$). Attrition also failed to be predicted by 'psychological consultations' (binary categorisation: any consultation *vs.* no consultation) pre-MI (chi² $p>0.05$).

Mean anxiety and depression scores in the hospital (depression = 4.3; anxiety = 6.6) and thereafter failed to reach borderline clinical case status. Mean scores for both anxiety and depression actually increased but by less than one scale point following hospital discharge (*Time 2*), with a gradual decline in mean scores to levels similar to *Time 1* over the next three returns. However, the number of patients who experienced clinical or borderline clinical case status for anxiety in hospital was substantial (34%) and this fell little over the six-month period, with 37 patients classed as experiencing clinical or borderline clinical case status six months post-MI. Of these, 23 (62%) also experienced similar case status for depression at the same time point.

Depression levels in hospital were lower (13%) but actually rose slightly at six months post-MI (20%). While 24

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Key messages

- While anxiety and depression after a MI have been shown to influence subsequent coronary morbidity and mortality, we do not know how such psychological states present and are dealt with
- Consultations rates before a primary MI indicate that an episode may not be as unpredictable as many patients report
- GPs provide a prompt and high level of medical care for post-MI patients but do not appear to identify the substantial level of psychological sequelae
- When psychological problems are identified, GPs advise and are prepared to provide drug treatment for anxiety or depression but do not make referrals for support psychological services

patients evidenced clinical/borderline case status depression six months post-MI, only one patient from this grouping presented without similar case status for anxiety. These case status data for anxiety or depression at each assessment are presented in table 3.

We examined the relationship between pre-MI consultation for psychological issues and post-MI levels of anxiety and depression. Analyses (chi^2) were effected for categorical transformation of the HADS data into the total of clinical/borderline cases ($\geq$ 8) at each post-MI interval, with pre-MI consultation dichotomised into no consultation *vs.* one or more consultations. While some patients with psychological issues pre-MI showed clinical case levels of distress post-MI, the analyses were non-significant at each post-MI test assessment.

Discussion

While patients may claim their coronary episode is unexpected, these data suggest that the majority of MI patients present with chest pains or cardiovascular symptoms in the two years before their infarct. Psychological issues for 27% of patients, most commonly depression, are evident for many patients who subsequently experience a MI.

Impressively, there was a high rate of doctor/patient contact (96%) in the week following hospital discharge. The mean number of consultations post-MI over six months was similar to levels during the longer 24-month period pre-MI. The most frequent category of consultation was for cardiovascular issues, with a mean of three consultations during the six-month post-MI period. Psychological consultations were, however reduced, and apparent for only 10% of patients (cf. 27% pre-MI), although this should be interpreted in the context of the reduced data acquisition period post-MI. Anxiety was predominant post-MI, in contrast to depression pre-MI. Drug treatment was the most frequent outcome for a psychological issue, with a similar level of prescription to that seen pre-MI, largely for patients who had not received such drugs pre-MI. While advice was frequently offered post-MI (37% of psychological consultations), in no case was a referral made for formal psychological assessment or treatment.

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It seems that many patients with affective problems following their MI do not seek help from their GP, possibly because of denial, or because cardiovascular concerns were salient, with patients not wanting to make further demands on their GP. Other evidence indicates that patients' own assessments of distress differ from those of their doctor.[18] Most drug prescriptions for anxiety or depression post-MI were new, indicating that distress probably results from the coronary episode.

The higher prevalence rate for anxiety rather than depression runs counter to findings from North America but is consistent with other studies from the UK[19,20] and Australia.[21] In all but a single patient, clinical case status of depression was associated with case status anxiety, indicating a broad basis to the emotional distress. However, 35% of patients presenting with case/borderline case status anxiety post-MI did so without associated depression.

Mean anxiety and depression scores increased following hospital assessment but declined thereafter to show little difference between *Time 1* and *Time 4.* However, the mean score for those with clinical case levels of anxiety (score > 10) fell substantially from 13.9 to 5.9 over six months. Moreover, 72% of patients with case level anxiety and 77% of those with case depression at *Time 1* were unchanged in case category at *Time 4.* This relative stability belies a significant clinical improvement for some patients. Conversely, a minority of patients experience or develop case levels of distress some time during the six-month post-MI period.

> ***'The challenge is to identify those patients who have or develop poor emotional profiles post-MI'***

In summary, the study suggests low consultation rates for psychological consultations post-MI despite high levels of distress documented by questionnaire. When psychological consultations do take place, drug treatment is more likely than any formal psychological referral. High prevalence rates for anxiety six months post-MI indicate an issue that is not satisfactorily addressed in current primary care practice. The challenge is to identify those patients who have or develop poor emotional profiles post-MI and to target them for interventions during rehabilitation to improve their quality of life.

While the pre-MI data indicate high levels of distress, we did not identify whether these reached a peak proximal

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to the episode. We have not investigated whether the negative picture with respect to mood is because patients who failed to complete questionnaires or complete the rehabilitation programme became *less* anxious or depressed, although we feel this unlikely. Moreover, there is no inclusion of alternative groups of patients against which to compare reported consultation rates.

Despite these limitations and that of the use of a proxy measure (consultation rates) to examine pre-MI levels of distress, this study is unique in tracing the coronary patient profile of distress from pre-MI to six months post-episode.

Conflict of interest

None declared.

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References

1. Cay L. Psychological problems in patients after a myocardial infarction. *Adv Cardiol* 1982;**29**:108-12.
2. Carney RM, Freedland KE. Depression, mortality, and medical morbidity in patients with coronary heart disease. *Biol Psychiat* 2003;**54**:241-7.
3. Havik, OE, Maeland JG. Verbal denial and outcome in myocardial infarction patients. *J Psychosom Res* 1988;**32**:145-57.
4. Frasure-Smith N, Lesperance F, Talajic M. Depression following myocardial infarction. *JAMA* 1993;**270**:1819-25.
5. Barefoot JC, Helms MJ, Mark DB *et al.* Depression and long-term mortality risk in patients with coronary artery disease. *Am J Cardiol* 1996;**78**:613-17.
6. Frasure-Smith N, Lesperance F, Juneau M, Talajic M, Bourassa MG. Gender, depression, and one-year prognosis after myocardial infarction. *Psychosom Med* 1999;**61**:26-37.
7. Romanelli J, Fauerbach J, Bush D, Ziegelstein R. The significance of depression in older patients after myocardial infarction. *Am Geriat Soc J* 2002;**50**:819-22.
8. O'Connor C, Gurbel P, Serebruany V. Depression and ischemic heart disease. *Am Heart J* 2000;**140**:563-9.
9. Moser DK, Dracup K. Is anxiety early after myocardial infarction associated with subsequent ischemic events? *Psychosom Med* 1996;**58**:118-24.
10. Sesso HD, Kawachi I, Vokonas PS, Sparrow D. Depression and the risk of coronary heart disease in the Normative Aging Study. *Am J Cardiol* 1998;**82**:851-6.
11. Penninx BWJH, Guralnik JM, Mendes de Leon CF *et al.* Cardiovascular events and mortality in newly and chronically depressed persons > 70 years of age. *Am J Cardiol* 1998;**81**:988-94.
12. Broadhead WE, Blazer DG, George LK, Tse CK. Depression, disability days, and days lost from work in a prospective epidemiological survey. *JAMA* 1990;**264**:2525-8.
13. Kavan MG, Elsasser GN, Hurd RH. Depression after acute myocardial infarction. *Postgrad Med* 1991;**89**:83-9.
14. NHS. National Service Framework for Coronary Heart Disease. Chapter Seven: Cardiac rehabilitation. London: March 2000.
15. NHS. National Institute for Clinical Excellence. Prophylaxis for patients who have experienced a myocardial infarction. London: April, 2001.
16. Horgan J, Bethell, H, Carson P *et al.* Working party on cardiac rehabilitation, *Br Heart J* 1992;**67**:412-18.
17. Zigmond A, Snaith RP. The Hospital Anxiety and Depression Scale. *Acta Psychiat Scand* 1983;**67**:361-70.
18. O'Brien JL, Moser DK, Riegel B *et al.* Comparison of anxiety assessments between clinicians and patients with myocardial infarction in cardiac critical care units. *Am J Crit Care* 2001:**10**:97-103.
19. Jones DA, West RR. Psychological rehabilitation after myocardial infarction: multicentre randomised control trial. *BMJ* 1996;**313**:1517-21.
20. Lane D, Carroll D, Ring C, Beevers G, Yip GYH. In hospital symptoms of depression do not predict mortality 3 years after myocardial infarction. *Int J Epidemiol* 2002;**31**:1179-82.
21. Worcester MC, Hare, DL, Oliver RG, Reid, MA, Goble AJ. Early programmes of high and low intensity exercise and quality of life after myocardial infarction. *BMJ* 1993;**307**:1244-7.

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