Prevalence of depression and anxiety symptoms in elderly patients admitted in post-acute intermediate care

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SUMMARY

Objectives Depression and anxiety symptoms are common in medically ill older patients. We investigated the prevalence and predictors of depression and anxiety symptoms in older patients admitted for further rehabilitation in post acute intermediate care.

Design Observational cohort study.

Setting An intermediate care unit, North West of England.

Participants One hundred and seventy-three older patients (60 male), aged mean (SD) 80 (8.1) years, referred for further rehabilitation to intermediate care.

Measurements Depression and anxiety symptoms were assessed by the Hospital Anxiety and Depression Scale, and severity of depression examined by the Montgomery Asberg Depression Rating Scale. Physical disability was assessed by the Nottingham Extended ADL Scale and quality of life by the SF-36.

Results Sixty-five patients (38%) were identified with depressive symptoms, 29 (17%) with clinical depression, 73 (43%) with anxiety symptoms, and 43 (25%) with clinical anxiety. 15 (35%) of the latter did not have elevated depression scores (9% of the sample). Of those with clinical depression, 14 (48%) were mildly depressed and 15 (52%) moderately depressed. Longer stay in the unit was predicted by severity of depression, physical disability, low cognition and living alone (total adjusted $R^2 = 0.24$).

Conclusions Clinical depression and anxiety are common in older patients admitted in intermediate care. Anxiety is often but not invariably secondary to depression and both should be screened for. Depression is an important modifiable factor affecting length of stay. The benefits of structured management programmes for anxiety and depression in patients admitted in intermediate care are worthy of evaluation. Copyright © 2008 John Wiley & Sons, Ltd.

Key words — intermediate care; depression; anxiety; length of stay; elderly

INTRODUCTION

A recent UK Government initiative has increased the number of National Health Service beds (by 2004, 7,000 in total). Of these 5,000 were in intermediate care (Department of Health, 2002). Intermediate care provides a wide range of services intended to reduce possible hospital admission or readmission and to provide further rehabilitation as a transition from hospital to home (Department of Health, 2002). Older patients with acute medical illnesses may take longer than younger patients to regain full recovery and stability. The purpose of intermediate care is to improve the transition from hospital to home by multidisciplinary team involvement, increasing patients' confidence and physical functioning, and implementing appropriate discharge planning including independent living at home.

Depression and anxiety symptoms are common in the medically ill (Jackson and Baldwin, 1993; McCusker et al., 2005). Depending on the measure
the prevalence of depression is 25–45% and anxiety symptoms up to 40% (Kvaal et al., 2001). In nursing homes the prevalence of depression and anxiety is reported as 34% and 29% respectively (Smalbrugge et al., 2005; Achterberg et al., 2006). Studies have shown the adverse outcomes of untreated depression and anxiety symptoms in older patients including poor compliance with medical treatment (DiMatteo et al., 2000), frequent utilisation of healthcare services (Koenig et al., 1989; Yohannes et al., 2000) and prolonged duration of hospitalisation for acute medical illness (Koenig et al., 1989; Yohannes et al., 2000). To date no studies have investigated the prevalence of depression and anxiety symptoms in older patients and their impact on length of stay in intermediate care. The primary aims of the study were to examine the prevalence and predictors of depressive and anxiety symptoms and to assess their impact on length of stay, physical disability and quality of life in older patients admitted for further rehabilitation in post-acute intermediate care. We also hypothesised that older patients with depressive and anxiety symptoms would be more likely to spend longer periods in an intermediate care unit for further rehabilitation and/or social care services compared with non-depressed or non-anxious patients.

METHODS

Subject selection

Subjects comprised a consecutive series of older patients who were aged ≥60 years and were referred from the acute hospital setting or from general practitioners to a post-acute 36-bedded intermediate care unit. A few days after admission patients were approached by a research physiotherapist with experience in administering physical, quality of life and psychological well-being questionnaires.

Exclusion criteria comprised: terminal illness; refusal of written informed consent; psychotic disease; hearing impairment or dysphasia severe enough to prevent questionnaire completion; or a cognitive disorder, evidenced by a score of 23 or less on the Mini Mental State Examination (MMSE) (Folstein et al., 1975). Subjects gave written witnessed informed consent. The study was approved by the local research ethics committee.

Study design

Patients were seen in the intermediate care unit. Demographic characteristics were obtained from the unit records. All the questionnaires were self-completed by the patients except the Montgomery Asberg Depression Rating Scale and MMSE. Cognition was assessed using the MMSE. Details of co-morbid diseases were collected using the Charlson Index (Charlson and Pompei, 1987). Depression and anxiety symptoms were assessed using the Hospital Anxiety Depression Scale (HAD) (Zigmond and Snaith, 1983). Those patients who were identified as depressed (HAD score ≥11), had a further assessment to determine the severity of clinical depression using the Montgomery Asberg Depression Rating Scale (MADRS) (Montogomery and Asberg, 1979). Patients also self-completed the Nottingham Extended ADL (NEADL) to assess physical disability (Nouri and Lincoln, 1987). Quality of life was assessed using the SF-36 questionnaire (Brazier et al., 1992).

Outcome measures

An individual scoring HAD anxiety ≥8 and HAD depression ≥8 were assessed as suffering from anxiety and depressive symptoms and those with a score of ≥11 classified as a ‘case’ of clinical depression or anxiety (Zigmond and Snaith, 1983).

The MADRS assesses severity of clinical depression (Montogomery and Asberg, 1979). It has ten items scored compositely which results in a maximum total score of 60. Low scores indicate mild depression and high scores correspond to severe depression. Patients rated their responses using a Likert seven-point category scale for example, 0 = ‘enjoying life’, 6 = ‘explicit plans for suicide’.

The NEADL (Nouri and Lincoln, 1987) is a physical disability scale, valid and reliable in older patients with chronic diseases. It comprises 21 activities of daily living self-report items, divided into four domains: mobility (six activities), kitchen (five activities), domestic (four activities) and leisure (six activities). Low scores on a scale of 0–21 indicate difficulties in daily activities.

The SF-36 has been widely employed to assess quality of life in older people (both medically ill inpatients and healthy subjects) (Sewitch et al., 2004; Stein and Barrett-Connor, 2002). It is a valid and responsive scale (Brazier et al., 1992), comprising 36 questions with eight domains: physical functioning, role physical, bodily pain, general health, vitality, social functioning, role emotional and mental health. The eight sub-domains low scores on a scale 0–100 correspond to poor quality of life.
Data analysis

Descriptive analysis was employed where appropriate. Analysis of variance was employed to investigate differences in the mean score of the three sub-groups, e.g. physical disability between clinical depression, depressive symptoms and no depression. Post hoc analysis was performed using a Bonferroni correction method. We performed three separate step-wise multiple regression analyses: (1) to examine the variables predicting length of stay in the Intermediate Care Unit, using the total length of stay as the dependent variable; (2) to examine predictors of anxiety we employed the HAD anxiety score as the dependent variable; (3) to identify factors predicting depression using the HAD depression score as the dependent variable. Significance was set at $p < 0.05$.

RESULTS

We approached 220 patients consecutively admitted into a local intermediate care unit from January 2006 to March 2007. Twenty patients (9%) declined the invitation to participate. Thirteen subjects were excluded because of dementia, 12 were excluded because of severe communication problems and two did not complete the questionnaires. Other data have been reported separately (Yohannes et al., 2007).

One hundred and seventy three patients (60 men) completed the study. Their age range was 60–97 (mean 80) years.

Table 1 shows the demographic characteristics of the subjects. One hundred and thirty (75% of 173) of the patients had suffered one or more falls in the past year. Most had been acutely admitted to hospital because of acute medical illness (155, 90%), and 18 (10%) had been directly referred to intermediate care by their GPs.

Table 2. Depressive symptoms $\geq 8$ vs without depression (mean SD)

<table>
<thead>
<tr>
<th></th>
<th>Depression $\geq 8$ ($n = 65$)</th>
<th>Non-depression &lt;8 ($n = 108$)</th>
<th>$p$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>81.6 (8.1)</td>
<td>78.4 (7.8)</td>
<td>0.01</td>
</tr>
<tr>
<td>Number of falls in the previous year</td>
<td>2.2 (2.1)</td>
<td>1.54 (1.7)</td>
<td>0.02</td>
</tr>
<tr>
<td>Pack years</td>
<td>24.8 (27.4)</td>
<td>16.1 (22.2)</td>
<td>0.02</td>
</tr>
<tr>
<td>MMSE</td>
<td>25.00 (2.0)</td>
<td>27 (3.00)</td>
<td>0.01</td>
</tr>
<tr>
<td>BMI</td>
<td>24.9 (6.1)</td>
<td>23.2 (4.3)</td>
<td>0.03</td>
</tr>
<tr>
<td>Anxiety score</td>
<td>9.6 (3.8)</td>
<td>5.7 (3.9)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Role physical</td>
<td>19.5 (25.9)</td>
<td>27.7 (25.5)</td>
<td>0.04</td>
</tr>
<tr>
<td>Health perception</td>
<td>40.8 (15.3)</td>
<td>55.6 (17.1)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Role emotional</td>
<td>5.1 (19.7)</td>
<td>16.0 (34.8)</td>
<td>0.02</td>
</tr>
<tr>
<td>Social functioning</td>
<td>42.3 (17.4)</td>
<td>52.2 (22.1)</td>
<td>&lt;0.002</td>
</tr>
<tr>
<td>NEADL</td>
<td>10.1 (4.1)</td>
<td>12.0 (3.7)</td>
<td>&lt;0.002</td>
</tr>
</tbody>
</table>

BMI = Body Mass Index; MMSE = Mini Mental State Examination; NEADL = Nottingham extended activities of daily living.
Length of stay in intermediate care

Table 3 shows results of multiple regression analysis with length of stay as the dependent variable. Predictors were NEADL score \((p = 0.03)\), MMSE \((p < 0.0001)\), household composition \((p = 0.04)\) and MADRS score \((p = 0.01)\). Further analysis revealed 12% of the variance was accounted for by MADRS score (those with severe depression more likely to spend longer time in the unit), 5% by MMSE (those with lower cognitive function more likely to spend longer time), 3% by household composition (those living alone more likely to spend longer time) and 3% by NEADL (those with severe physical disability more likely to spend longer time). In the regression model age, gender, and anxiety scores were not predictors length of stay in the unit.

Depressive symptoms

Thirty-six subjects (21%) had depressive symptoms and 29 (17%) were clinically depressed. Furthermore, out of 29 clinically depressed older patients, 20 (69%) which account of the patients suffering from both anxiety and depression.

Further analysis revealed that clinically depressed older patients (identified by depression score \(\geq 11\)) had more severe physical disability compared with non-depressed patients mean (SEM) \([9.04 (0.66) \text{ vs } 12.08 (0.36), F = -3.04, p < 0.001]\). There was no statistically significant difference on the measure of physical disability between clinically depressed vs those with depressive symptoms (mean (SEM) 9.04 (0.66) vs 11.03 (0.74), \(F = -1.05, p = 0.46\)).

Of the 29 clinically depressed older patients, 14 (48%) were mildly depressed (MADRS score 7–19), and 15 (52%) were moderately depressed. The severity of depression was associated with increasing comorbidity scores \((r = 0.28, p < 0.007)\).

Twenty-nine patients were receiving antidepressant drug therapy (as documented in their medical charts). Of these, nine (31%) had no depressive symptoms, seven (24%) had depressive symptoms and 13 (45%) were clinically depressed.

Table 4 shows predictors of depression in older patients. The following variables were predictors: sex \((p < 0.004)\); household composition \((p = 0.05)\); social class [registrar classification] \((p = 0.03)\); and Nottingham Extended ADL scale [NEADL] \((p < 0.0001)\). Further analysis revealed that 25% of the variance accounted for by anxiety score (the more anxious being more likely suffer depression), 10% of the variance was accounted for by NEADL (the more physically disabled being more likely to suffer depression), 2% by social class (those patients from lower social class more likely to suffer depression), 2% by sex (men more likely to suffer depression) and 1% by household composition (living alone more likely to suffer depression).

Co-morbid anxiety symptoms with depression

Seventy-five (43%) patients were suffering from anxiety symptoms. Of these, 43 (57%) had clinical anxiety symptoms (anxiety score \(\geq 11\)), amounting to 25% of the sample. Eight of 43 patients (19%) with clinical anxiety symptoms had depressive symptoms (depression score 8–10) and 15 of 43 (35%) of those with clinical anxiety had a depression score \(< 8\). Therefore, 9% had clinical anxiety in the absence of depression. Twenty of 43 (47%) of those with clinical anxiety had a depression score \(\geq 11\).

Predictors of anxiety in older patients with chronic diseases. These comprised severity of clinical depres-

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Table 3. Predictors of length of stay in the intermediate care unit (Multiple regression analysis)

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>T-value</th>
<th>P-value</th>
<th>(R^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEADL</td>
<td>−2.175</td>
<td>0.03</td>
<td>3%</td>
</tr>
<tr>
<td>MMSE</td>
<td>−3.8</td>
<td>0.001</td>
<td>5%</td>
</tr>
<tr>
<td>Household composition</td>
<td>−1.99</td>
<td>0.04</td>
<td>3%</td>
</tr>
<tr>
<td>MADRS</td>
<td>2.40</td>
<td>0.01</td>
<td>12%</td>
</tr>
</tbody>
</table>

Adjusted \(R^2 = 0.24\).

Household composition (1 = living alone; 2 = Living with others with spouse, family or friends).

MADRS = Montgomery and Asberg Depression Rating Scale; MMSE = Mini Mental State Examination; NEADL = Nottingham Extended Activities of Daily Living.

Table 4. Predictors of depression in older patients with chronic diseases (Multiple regression analysis)

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>T-value</th>
<th>P-value</th>
<th>(R^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household composition</td>
<td>−1.949</td>
<td>0.05</td>
<td>1%</td>
</tr>
<tr>
<td>Sex</td>
<td>−2.917</td>
<td>&lt;0.004</td>
<td>2%</td>
</tr>
<tr>
<td>Social class</td>
<td>2.139</td>
<td>0.03</td>
<td>3%</td>
</tr>
<tr>
<td>NEADL</td>
<td>−4.286</td>
<td>&lt;0.0001</td>
<td>10%</td>
</tr>
<tr>
<td>Anxiety score</td>
<td>7.880</td>
<td>&lt;0.0001</td>
<td>25%</td>
</tr>
</tbody>
</table>

Adjusted \(R^2 = 0.40\).

Sex, Male = 1; Female = 2.

Household composition, Living alone = 1; Living with family or partner = 2.

Social class, Registrar General Classification.

NEADL = Nottingham Extended Activities of Daily Living.
sion assessed by MADRS score ($t = 6.09, p < 0.0001$), lower perception of general health ($t = -2.64$, $p = 0.01$) and frequency of falls in the past year ($t = 1.81, p = 0.07$). Further analysis revealed that severity of depression was the most powerful predictor of anxiety score, accounting for 22% of the variance. Lower perception of general health accounted for 19% of the variance, and frequency of falls in the past year accounted for 2%. The total adjusted $R^2 = 0.46$.

**DISCUSSION**

To our knowledge this is the first study to investigate the prevalence and predictors of anxiety and depressive symptoms in post-acute intermediate care. One in six patients had depression severe enough to warrant intervention and almost one in ten had anxiety symptoms which were not secondary to depression. Length of stay in the unit was associated with physical disability, living alone, cognitive impairment and severity of depression.

Our findings have several implications for clinical practice. First, depressive symptoms (clinical depression HAD $>11$) are common, and comparable with older patients admitted with acute illness (Jackson and Baldwin, 1993). Consistent with previous studies in older patients with chronic diseases (Achterberg et al., 2006) we found that depression was associated with physical disability. Depressed older patients have significantly lower functional status compared to non-depressed patients and this may contribute to slower post acute care early recovery. It is likely that depressed older patients may lack the initiative to participate in exercise programmes, and may require more encouragement and support by the staff to gain similar function to that of non-depressed patients. However, we are unable to confirm or refute this assumption as we have not collected data either on the duration of interventions aimed at improving physical activities, (e.g. balance and gait training and psycho-social support provided during their stay in the unit) or on the difficulties experienced by the staff treating these patients. Length of stay prior to transfer to intermediate care had no bearing on length of stay in the intermediate care unit.

Over three-quarters of the patients in our study had had one or more non-injurious falls in the past year. Further analysis revealed that recurrent falling showed a trend of association with anxiety symptoms. However, we are unable to elucidate whether medication prescribed for anxiety symptoms led to recurrent falls or vice versa in contrast to previous findings (Kelly et al., 2003). Falls may have compromised frail elderly patients’ balance, confidence and self-esteem, in turn restricting or curtailing participation in social activities and leading to poorer quality of life. This study adds further evidence of the importance of comprehensive assessment and rehabilitation in that recurrent fallers should be identified for intensive treatment in order to reduce adverse outcomes (Donald and Bulpit, 1999). Previous studies have shown that fear of falling impairs quality of life and increases level of depressive symptoms, functional decline and is also a predictor of nursing home admission (Cumming et al., 2000; Turco et al., 2004).

Secondly, nearly half of our patients suffered from anxiety symptoms that warranted medical intervention. Frail older patients might be anxious after acute episodes, uncertain of what is going to happen in post-acute care. However, in our study anxiety was often associated with severity of depression and perception of poor general health. The cross-sectional nature of our data gives no indication of the direction of causality, whether anxiety symptoms lead to poor general health and severity of depression or vice versa. However, depression and physical disability are known to interact adversely in health outcomes so that healthcare professionals in Intermediate care should be aware of the importance of detection and treatment of anxiety symptoms and of their management (Evans et al., 2005). The prevalence of anxious depression was 69% in our study, far higher than previously reported: 42% and 46% with major depression in outpatient clinics receiving psychiatric services (Fava et al., 2004; Jeste et al., 2006). Patients with anxious depression are most likely to have greater suicidal ideation and severely depressive symptoms compared with depression and anxiety alone (Fava et al., 2004; Jeste et al., 2006). Hence, this group of patients may require further investigation and closer patient management by health care professionals. It is probably clinically helpful to regard presence of clinical anxiety as a potential predictor of depression. This is consistent with our previous work in elderly outpatients with chronic obstructive pulmonary disease (Yohannes et al., 2000). However, this study also shows that not all anxiety is secondary to depression.

Thirdly, it is interesting to note that severity of depression measured by the MADRS score (as opposed to depressive symptoms or depression per se) was the most important variable predicting longer stay in the post acute unit. It is plausible that more severe depression may have compromised older patients’ hope and enthusiasm and (when coupled with the recent acute episodes) their ability to engage in the rehabilitation process and in early discharge planning.
Furthermore, those severely depressed patients may require further social and home help services to cope at home. Unfortunately, we have not examined the discharge planning protocol employed or the follow-up of patients post discharge by the multidisciplinary team. It is worth adding that among older adults even milder forms of depression are associated with poor health outcomes (Evans et al., 2005).

We found (unsurprisingly) that physical disability was associated with the length of stay. Further household composition (living alone) was related to longer stay and might be an added factor for patients who are physically disabled and for whom more intensive home support packages might be required. Physical disability and household composition (living alone) were independent predictors and each contributed to length of stay in the unit. Although dementia was an exclusion criterion for this study, lower cognitive function as measured by the MMSE was a strong predictor of length of stay and this is consistent with other evidence (Royal College of Psychiatrists, 2005). Low cognitive function is likely to be another added factor for lengthening stay and suggests that a cognitive screening assessment is important in this patient group.

The study has several limitations. Firstly, the study was relatively small sample size of cross-sectional, observational design and it has limited ability to address causation or course of depression. Secondly, we recruited patients only from a single site. We have however, no reason to believe that our sample might be different to other intermediate care settings. The demographic characteristics of our subjects are similar to recent studies in intermediate care settings (Griffiths et al., 2005; Young et al., 2005; Wilson et al., 2006). Thirdly, we have not explored whether there was a difference in prevalence of depression and anxiety for patients referred from general practice (10% in this sample) as numbers are too small for a separate analysis. Finally we have not collected data on healthcare utilization post-discharge, or on patients’ satisfaction with the service during their rehabilitation in the unit.

Despite these limitations, our findings indicate that in older patients in post-acute intermediate care the prevalence of depression and of anxiety symptoms is high. These symptoms should be assessed and treated as part of multi-disciplinary interventions which recognise that depression often reduces the patient’s motivation to adhere to planned treatment. Detection of depression and anxiety will clearly have resource implications, although these may be reduced by employing simple short screening tests, such as the Hospital Anxiety Depression Scale and the Brief Assessment Schedule Depression Cards which have been shown to be valuable in detection of depression in elderly patients with chronic illness and disability in a variety of inpatient settings (Yohannes et al., 2000).

Severity of depression, physical disability, and cognitive impairment were associated with longer length of stay in intermediate care. We suggest that future research could evaluate a structured anxiety and depression management programme for older patients admitted to intermediate care, employing evidence-based interventions, both pharmacological (antidepressants when indicated) and non-pharmacological, such as group exercise, relaxation therapy and peer support.

KEY POINTS

- Clinical depression and anxiety are common in older patients admitted in intermediate care.
- One in six patients had depression severe enough to warrant intervention and almost one in ten had anxiety symptoms which were not secondary to depression.
- Length of stay in the intermediate care unit was associated with physical disability, living alone, cognitive impairment and severity of depression.
- The benefits of structured management programmes for anxiety and depression in patients admitted in intermediate care are worthy of evaluation.

CONFLICT OF INTEREST

None known.

ACKNOWLEDGEMENTS

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REFERENCES

PREVALENCE OF DEPRESSION AND ANXIETY IN INTERMEDIATE CARE


