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Research paper

Underdiagnosis and undertreatment of depression in nursing home residents

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ABSTRACT

Background: Depression in nursing home residents decreases their quality of life and is related to behavioral symptoms of dementia. Diagnosing depression in patients with advanced cognitive impairment may be challenging. The purpose of this study was to find out how well depression is diagnosed and treated in Dutch nursing homes in relation with age and dementia severity.
Methods: This cross-sectional study evaluated diagnoses and treatment of depression in nursing home residents using Minimum Data Set (MDS) information. Clinical and MDS-based diagnoses of depression were compared in 1851 residents of eight Dutch nursing homes and their medication use was analyzed.
Results: A clinical diagnosis of depression was present in 14.4% of residents while 42.5% had an MDS diagnosis. This difference was mainly due to an increasing discrepancy between clinical and MDS diagnoses with increasing stage of cognitive impairment. Antidepressants were used only in 33.9% of residents with an MDS diagnosis of severe depression and were given less often to older subject with depression diagnosis. Symptoms of depression were present even in residents treated with antidepressants. Antipsychotics were given to 220 subjects and antianxiety medications to 100 subjects who were diagnosed with depression but were not treated with antidepressants.
Conclusions: Depression is underdiagnosed and undertreated, especially in nursing home residents with cognitive impairment. Some residents seem to be treated for depression with antipsychotics and antianxiety medications. More attention paid to recognition and treatment of depression can be expected to improve quality of life of many nursing home residents.

1. Introduction

One of the important goals of care for nursing home residents is maintenance of their quality of life that is influenced by their physical impairments and institutional living. Achieving this goal is very difficult in residents who are depressed. Depression is often overlooked by nursing and social work staff [1], and social workers and activity staff are likely to view depression as a normal [2]. Thus, residents may not be referred for evaluation by physicians and mental health workers. The presence of depression decreases significantly the quality of life of elderly persons even when the depression is minor [3]. Depression is also associated with disability [4], decreased active life expectancy [5], worsened outcomes of comorbid chronic medical diseases [6], and may even cause nocturia [7]. Depression is especially detrimental in nursing home residents with dementia. It is related to behavioral symptoms of dementia [8] and is a risk factor for development of resistiveness to care that may escalate to abusive behavior and an independent risk factor for abusive behavior [9].

Prevalence of depression diagnoses in nursing home residents range from 11% to as high as 78% [10]. One reason for highly variable prevalence rates of depression is the difficulty of diagnosing depression in residents with cognitive impairment due to Alzheimer's disease (AD) and other progressive dementias who often constitute the majority of nursing home residents. Major overlap between symptoms of depression and symptoms of dementia complicate accurate diagnosis [11]. Additional reasons for the wide range of prevalence include difference in researchers' focus on symptoms versus specifically defined depressive disorders, diverse study samples varying in causes of dementia, stage of illness, country of residence, and placement of patient, as well as variation in the instruments used to assess depressive symptoms and disorders. Furthermore, disagreement over diagnostic criteria for depression in AD is another reason why prevalence rates are so

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variable; no general consensus on the most valid method to assess and diagnose depression in AD exists [11].

Diagnosing depression is especially difficult in residents with advanced dementia because the residents are untestable with commonly used depression scales. The use of the Cornell Scale for Depression in Dementia failed to significantly discriminate depressed residents when compared to a gold standard of psychiatric diagnosis [12] and another study found that 22% of residents could not be diagnosed by this scale because some items could not be rated [13]. Because of these diagnostic problems, depression on nursing home residents has been generally viewed as underdiagnosed and undertreated [14]. However, more recent data indicate that recognition of depression in the United States increased gradually and, in 2007, depression was diagnosed in 51.8% of nursing home residents and that 82.8% of diagnosed residents were treated with antidepressants [10]. Nevertheless, residents with severe dementia were diagnosed and treated less frequently.

Assessment of nursing home residents by the Minimum Data Set (MDS) provides a source of data that can be used to evaluate how well symptoms of depression are recognized and treated. In this study, we addressed the hypothesis that depression is underdiagnosed and undertreated, by comparing prevalence of a clinical diagnosis of depression and prevalence of depressive symptoms indicating a diagnosis of depression by an MDS-based scale [15] in cognitively intact and impaired individuals residing in Dutch nursing homes. We also compared the frequency of treatment with antidepressants in residents with and without diagnosis of depression, and residents of different ages. Since there is evidence that depression is sometimes treated with antipsychotics and antianxiety medications [16], we also analyzed the use of these medications.

2. Methods and subject population

A cross-sectional study was performed using MDS 2.0 records [17] collected from 2,032 nursing home residents cared for in eight nursing homes in the Netherlands between April 2008 and December 2009. All nursing homes used MDS in that period and were regularly completing new assessments for all or almost all of their residents as required by the assessment instrument rules were selected. All residents that were not discharged within a week after admission received an initial assessment and all that were discharged received a discharge assessment. The assessment was completed by nurses/aides who have primary care responsibility for the resident. Such a nurse/aide usually had this responsibility for 5–8 residents on a particular ward. We selected assessments of 1851 residents who were 65 years old or older and the assessment was performed at least 3 months after nursing home admission. Since every nurse/aid had about six residents to care for, about 300 nurses/aids performed the assessments.

The MDS assessment was based on a combination of physical examination, patient history, observation, consultation of other caregivers, and information found in medical records. The symptoms used for the MDS depression diagnosis were recorded by nurses specifically trained for completing the MDS based on symptoms observed during the last 30 days. When a nursing home implemented MDS, a proper training was given by experienced MDS trainers to all on several occasions, but not assessors and to all other members of the staff who must deal with the results of the assessment. Full MDS assessments were performed within 7 days of admission to the facility, quarterly thereafter and whenever a significant change in status occurred. On several occasions, but not regularly or continuously, interrater studies have been done, showing kappas that compared well with published results of interrater variability concerning MDS items worldwide. It was the responsibility of the nursing home to keep assessors well trained and train new-on-the-job assessors. The quality of this training and retraining, however, was likely variable and was largely dependent on how much value was put on the use of the results of MDS by the management of a site. The MDS has been mandated for all nursing homes in the United States of America, and several European countries have since introduced it. In the Netherlands, until the end of 2009, 18 long-term care facilities, with some 2400 beds, voluntarily used the MDS 2.0 as a structural assessment instrument for care planning. (Since then, these facilities switched to the use of the newer interRAI LTCF and joined the 20+ facilities, with some 2000 beds, already using that instrument for some time.)

Evidence for a clinical diagnosis of depression was obtained from MDS item I1ee. In Dutch nursing homes, all patients are regularly seen by physicians from intake until discharge. Clinical diagnoses of cognitive impairment and depression in nursing home residents were made mostly by an elderly care physician (formerly named nursing home physician), or by the family physician/psychiatrist before admission to the nursing home. The clinical diagnoses were either recorded in the medical record or communicated orally to the care team during day-to-day contact or during multidisciplinary care plan meeting. Physician diagnoses were recorded in the MDS assessment by the nurse/aide assessor and revised, if deemed necessary. Psychiatrists did not usually enter nursing homes. The clinical diagnosis of depression was compared with the MDS derived Depression Rating Scale [15] which does not depend on patient reports and may be used regardless of the degree of cognitive impairment.

MDS Depression Rating Scale scores were calculated from seven MDS items: negative statements (E1a), anger (E1d), unrealistic fears (E1f), repetitive health complaints (E1 h), repetitive anxious complaints (E1i), sad expression (E1l) and crying (E1 m). The scores range from 0 to 14 and a score of ≥ 3 is used to indicate the presence of depression [15]. Cronbach's alpha for this scale in this study was .807.

Cognitive Performance Scale (CPS) ratings were calculated from four variables: short-term memory (B2a), cognitive skills for daily decision making (B4), making oneself understood (C4) and dependence in eating (G1hA) [18]. Scores range from 1 (borderline intact) to 6 (very severe impairment). Other data elements used in this study were age, diagnosis of AD (I1q), diagnosis of other dementias (I1u) and number of days receiving medications during the last 7 days (O4a-c). Treatment with psychoactive medications was analyzed by recoding the number of days to 0 for no treatment and 1 for treatment any number of days.

2.1. Statistical analysis

We computed Pearson correlations between clinical and MDS diagnoses of depression and compared prevalences of these diagnoses in different age groups and in residents with different severity of cognitive impairment (CPS 1-3 versus CPS 4-6) by Chi^2 tests We also used Chi^2 tests to compare the strength of associations of some variables. For some analyses, we selected only residents who had a CPS rating of 0 and did not have diagnoses of AD or other dementias (cognitively intact). The analyses were performed by SPSS version 18 or 19.

3. Results

The 1851 subjects were 83.6 ± 7.5 years old (range 65–103) and subjects with symptoms indicating presence of dementia were older (Table 1). Most of the subjects were female and depression symptoms were more common in females than in males. Symptoms of

Table 1
Demographic characteristics of subject population.

	No MDS symptoms indicating presence of depression	MDS symptoms indicating presence of depression	Total	Statistics
Age				
Mean ± SD	81.0 ± 7.6	84.7 ± 7.1	83.6 ± 7.5	$F = 101.6$ $P < .001$
> 71	61 (5.8%)	39 (4.8%)	100 (5.4%)	
71–75	113 (10.8%)	82 (10.2%)	195 (10.5%)	
76–80	167 (16.0%)	127 (15.8%)	294 (15.9%)	$X^2 = 2.74$
81–85	241 (23.1%)	209 (25.9%)	450 (24.3%)	
86–90	270 (25.9%)	207 (25.7%)	477 (25.8)	$P = .840$
91–95	150 (14.4%)	112 (13.9%)	262 (14.2%)	
> 95	42 (4.0%)	30 (3.7%)	72 (3.9%)	
Gender				
Females	704 (67.4%)	606 (75.2%)	1310 (70.8%)	$X^2 = 13.23$
Males	340 (32.6%)	200 (24.8%)	540 (29.2%)	$P < .001$
Diagnosis of dementia				
Alzheimer's	226 (21.8%)	265 (33.0%)	491 (26.7%)	
Other dementia	300 (28.9%)	281 (35.0%)	581 (31.5%)	$X^2 = 65.39$
Both	13 (1.3%)	16 (2.0%)	29 (1.6%)	$P < .001$
No diagnosis	500 (48.1%)	241 (30.0%)	741 (40.2%)	
Cognitive Performance Scale (CPS)				
Mean ± SD	2.87 ± 1.83	3.04 ± 1.92	2.99 ± 1.89	$F = 3.29$ $P = .07$
0	241 (23.1%)	48 (6.0%)	289 (15.6%)	
1	119 (11.4%)	64 (7.9%)	183 (9.9%)	
2	115 (11.0%)	69 (8.6%)	184 (9.9%)	$X^2 = 139.85$
3	262 (25.1%)	249 (30.9%)	511 (27.6%)	
4	54 (5.2%)	63 (7.8%)	117 (6.3%)	$P < .001$
5	178 (17.0%)	243 (30.1%)	421 (22.8%)	
6	75 (7.2%)	70 (8.7%)	145 (7.8%)	
Total	1044 (100%)	806 (100%)	1850 (100%)	

MDS: Minimum Data Set.

depression were more common in subjects with diagnoses of dementia than in subjects with no dementia diagnosis (Table 1) but when only subjects with diagnoses of depression were analyzed, there was no relationship between diagnoses of dementia and presence of depressive symptoms ($\chi^2 = 3.55$, $P = .169$). Cognitive impairment detected by the CPS MDS scale was more common than diagnosis of dementia and it was present in 84.4% of subjects. Symptoms of depression were more common in subjects with cognitive impairment than in subject who were cognitively intact (Table 1).

In cognitively intact residents without diagnosis of dementia, the clinical and MDS diagnoses of depression were most frequent at the ages 70-74 and declined with increasing age (Fig. 1). In these residents, the clinical and MDS diagnoses were significantly correlated ($r = .303$, $n = 271$, $P < .001$) although the MDS diagnosis was significantly more common (12.4% with clinical diagnosis vs. 18.8% with MDS diagnosis, Chi^2 = 32.4, $P < .001$). The prevalence of an MDS diagnosis of depression was much higher than the prevalence of a clinical diagnosis of depression at all ages (14.4% with clinical diagnosis vs. 42.5% with MDS diagnosis) (Fig. 2). In the whole subject population including cognitively impaired subjects, there was still a significant correlation between clinical and MDS diagnoses of depression but smaller than in the cognitively intact sample ($r = .196$, $n = 1850$, $P < .001$) most likely due to underdiagnosis of depression in subjects with cognitive impairment (Fig. 3).

Comparison of incidences of clinical diagnosis of depression and MDS symptoms of depression showed that 40% (104/259) of residents with a clinical diagnosis of depression did not have symptoms that would justify receiving an MDS diagnosis of depression. That might indicate successful antidepressant

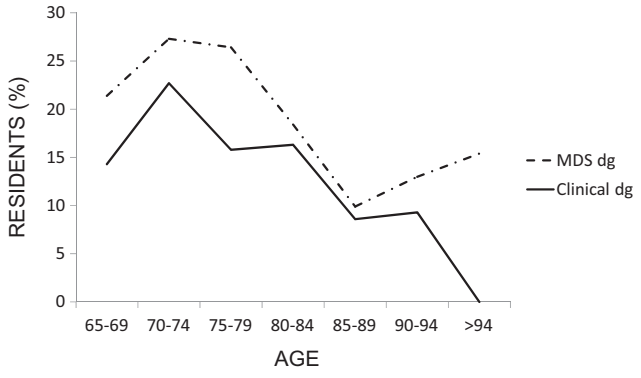

Fig. 1. Prevalence of diagnoses of depression in cognitively intact residents of different ages.

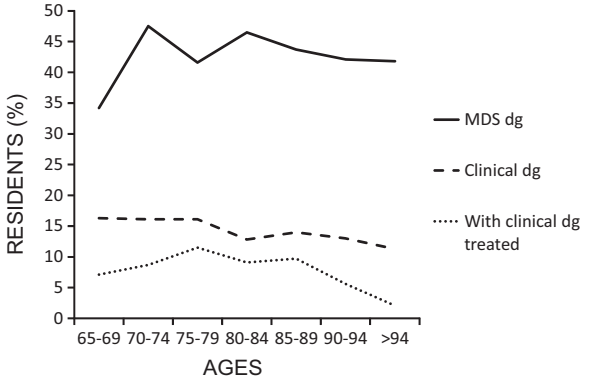

Fig. 2. Percent of diagnoses of depression and percent of treatment of clinically diagnosed residents at different ages (numbers in parentheses are *n*'s of residents regardless of age).

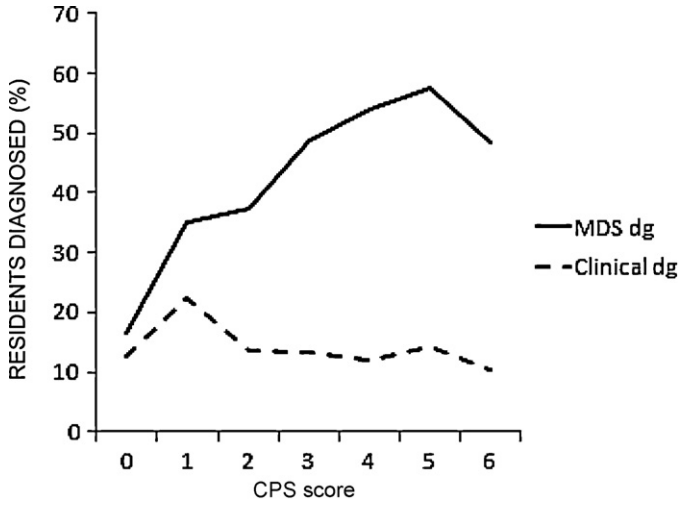

Fig. 3. Prevalence of diagnoses of depression in residents with different degrees of cognitive impairment.

treatment of these residents although only 55.8% of them were receiving antidepressants. Additionally, 8.7% of residents who did not receive the MDS diagnosis of depression were treated with antidepressants although they also did not have a clinical diagnosis of depression. Prevalence of antidepressant treatment increased with the increased number of symptoms indicating the presence of depression ($Chi^2 = 105.53$, $P < .001$). Antidepressant use decreased with age in residents with a clinical diagnosis of depression (as was shown in Fig. 2) whereas prevalence of antidepressant treatment did not differ in residents with different CPS scores (not shown).

Antipsychotics were administered to 26.8% of residents, more frequently to those with depression ($Chi^2 = 87.21$, $P < .001$). Two hundred and twenty (44.4%) of subjects receiving antipsychotics were diagnosed with depression but were not treated with antidepressants (11 [2.2%] with a clinical diagnosis of depression, 195 (39.4%) with MDS diagnosis of depression, and 14 [2.8%] with both diagnoses). Only 24.6% of residents treated with antipsychotics had psychotic symptoms that may have justified treatment with antipsychotics (29 [23.8%] had delusions, 59 [48.4%] hallucinations, and 34 [27.8] had both).

Treatment with antianxiety medications was less common but also increased with presence of depression ($Chi^2 = 28.58$, $P < .001$). Of the subjects receiving antianxiety medications, 100 were diagnosed with depression but were not treated with antidepressants. Of these, 10 (10%) had a clinical diagnosis of depression, 76 (76%) the MDS diagnosis of depression, and 14 (14%) both diagnoses. Only 17% of residents receiving antianxiety medications were diagnosed with anxiety disorder.

4. Discussion

Results of this study indicate that depression is underdiagnosed and undertreated in nursing home residents, especially in those who have cognitive impairment. In this study, a clinical diagnosis of depression cannot be considered a gold standard, because it is usually made by an elderly care physician with limited psychiatric training. In a Dutch model of care, on-staff trained elderly care physicians are certified after a 3-year vocational training [19]. Not all nursing homes employ a psychologist. Apparently the training and having physicians visit regularly and knowing patients well does not prevent physicians from underdiagnosing and undertreating depression, similar as was found with pain in Dutch nursing home residents [20]. The situation in other countries where nursing home residents are treated by general practitioners with limited psychiatric input cannot be expected to be much better.

Our results offer evidence that many residents who are clinically diagnosed as depressed are not effectively treated for depression and that such treatment is especially lacking as age of the residents increases. The results also suggest that antipsychotics and antianxiety medications are sometimes used to treat symptoms of depression instead of antidepressants, even in residents with a clinical diagnosis of depression.

We measured presence of symptoms of depression by analyzing data from MDS assessments using seven MDS items. A scale that utilizes the presence of symptoms that may warrant a diagnosis of depression when the score is 3 or higher was recently developed [15]. This scale had high specificity when compared to psychiatric diagnosis [12] and correlated well with the Cornell and Hamilton depression scales using "at least mild depression" as a cutoff point. It was also more sensitive and specific than the 15-item Geriatric Depression Scale (GDS) in detecting depression in a nursing home population [15]. In another study, the MDS depression scale did not correlate well with GDS [21], but GDS has limited validity in residents with dementia [22]. The MDS depression scale had acceptable specificity [23] and it was validated in the Netherlands [24]. In our study, the MDS depression scale correlated significantly with the clinical diagnosis of depression in cognitively intact residents. Correlation of MDS depression scale and clinical diagnosis was smaller in the total sample but that was most likely due to underdiagnosis of depression in subjects with dementia. Another indication of validity of the MDS scale is that prevalence of antidepressant treatment increased with increasing number of symptoms of depression. This indicates that clinicians were less likely to ignore more severe symptoms of depression.

Prevalence of a clinical diagnosis of depression did not differ in residents with different severity of cognitive impairment. However, the prevalence of the symptoms of depression increased with the severity of cognitive impairment until the most severe category. This finding is in contrast with a review of previous studies that found no association between severity of AD and the prevalence of comorbid depressive symptoms or diagnosed depression [25]. However, some of the analyzed studies employed self-reporting scales that cannot be used in persons with severe dementia and, therefore did not include these individuals. Moreover, five studies listed in that review that did use the whole spectrum of severity, found a significant association between severity of AD and prevalence of depression. Another possible explanation of the difference between our study and reported results may be due to our inclusion of dementia other than AD but we found a similar increase in prevalence of depression with severity of dementia in both AD and other dementias (not shown).

The presence of depression decreases significantly the quality of life of elderly individuals even when the depression is minor [3]. Depression is also associated with many symptoms, as mentioned in the Introduction Section. Depression is especially detrimental in nursing home residents with dementia. It is a risk factor for development of resistiveness to care that may escalate to abusive behavior and an independent risk factor for abusive behavior [9]. High prevalence of depression in individuals with Alzheimer's disease can be expected because Alzheimer's disease causes serotoninergic deficit [26]. Therefore, treatment with antidepressants that potentiate the effect of serotonin may be similar to treatment with cholinesterase inhibitors that potentiate the effect of acetylcholine. Of course, non-pharmacological treatment of depression in Alzheimer's disease may be also effective especially in patients with mild or moderate dementia [27] since it could be related to the awareness of the disease.

The use of antipsychotics in the treatment of depression is not indicated, unless there is a presence of delusions or hallucinations

or the antipsychotics are added to antidepressant treatment to enhance its effect [28]. Despite that, the results presented in this study indicate that antipsychotics are used alone in a significant number of residents with a diagnosis of dementia. Antipsychotics increase the risk of stroke and sudden cardiac death, triple the incidence of serious events in community dwelling individuals and double the incidence in nursing home residents, increase incidence of hip fractures and overall mortality rate [28]. Therefore, their use should be limited to residents with documented delusions and hallucinations. Similarly, benzodiazepines are sometimes used inappropriately for treatment of depression [16]. Benzodiazepines may increase confusion, and risk of falls and hip fractures [29].

This study has some limitations. We based the evidence for underdiagnosing of depression on analysis of MDS data using an MDS derived depression scale instead on actual clinical examination of the subjects. However, this MDS scale correlated well with clinical diagnoses when cognitively intact subjects were considered. Even if the scale does not fulfil all criteria for clinical diagnosis of depression, it is important to treat subjects with depression symptoms because even subsyndromal depression is associated with adverse effects [3,4]. In addition, it was recommended that criteria for diagnosis of depression in individuals with Alzheimer's disease (Depression in AD) should be different from criteria for diagnosis of depression in cognitively intact individuals [30]. Although the provisional diagnostic criteria were derived from those for Major Depressive Episode, there are several significant differences that may improve detection of depression in persons with dementia. First, Depression in AD requires the presence of fewer symptoms–only three or more vs. five or more for a Major Depressive Episode. Second, this diagnosis does not require the presence of symptoms nearly every day, as is the case for Major Depressive Episode. Third, criteria for the presence of irritability and for the presence of social isolation or withdrawal were added. Fourth, the criteria for loss of interest or pleasure were revised to reflect decreased positive affect or decreased pleasure in response to social contact and usual activities. Fifth, concentration problems are not included. We are not proposing that the antidepressant treatment should be started on the basis of MDS score alone. However, such a score should precipitate careful clinical examination that may lead to initiation of antidepressant treatment.

Another limitation is lack of detailed information about drugs used in treatment of depression. This is a cross-sectional study in which medication information was restricted to the last 7 days. We considered subjects to be treated even if they did not receive antidepressant every day. Since most antidepressants require daily administration to be effective, this may have led to an overestimation of the prevalence of effective antidepressant treatment. There was also no information about the doses used, and insufficient doses could be responsible for some of the remaining symptoms present in subjects who were receiving antidepressants. On the other hand, antidepressant treatment may not be indicated in some patients exhibiting symptoms that may indicate presence of depression, e.g., mood lability/weeping in stroke patients.

Despite these limitations, results of this study strongly suggest that clinicians in the Netherlands do not give enough attention to the presence of depression in nursing home residents, especially in residents who have dementia. Even when depression is diagnosed, it is often not treated effectively and the treatment may be less common in late age.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

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