# Depression, insight, and personality changes in alzheimer's disease and vascular dementia

# Depression, Insight, and Personality Changes in Alzheimer's Disease and Vascular Dementia

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**ABSTRACT**

Although it is generally believed that depression, retained insight, and preserved personality occur more frequently in vascular dementia than in Alzheimer's disease, there is little empiric evidence for this presumption. Most studies on this subject have been carried out with severely demented inpatients, and confounding factors such as age, sex, and severity of dementia have not been sufficiently taken into account. We compared 48 patients with relatively mild vascular dementia with 48 patients with Alzheimer's disease, matched for age, sex, and stage of dementia, to investigate if depression, lack of insight, and personality changes were related to the cause of dementia. The two groups did not differ regarding the incidence of major depression, the mean depression score, the awareness score, or the sum of scores on the items of the Blessed Dementia Scale concerning personality changes. We conclude that depression, lack of insight, and personality changes do not favor an etiology of vascular dementia over that of Alzheimer's disease. The present findings underscore the notion that the severity of the dementia should be considered in studies on the differences between vascular dementia and Alzheimer's disease. (*J Geriatr Psychiatry Neurol* 1995; 8:23–27).

Alzheimer's disease (AD) and vascular dementia (VaD) are the two most common causes of dementia.[1] Differentiation between these two disorders in their early phase is important, because early, remedial, therapeutic interventions for vascular dementia are more successful.[2] Furthermore, homogeneous diagnostic groups are a prerequisite for epidemiologic and pharmacologic research. In the past, many attempts have been made to diagnose VaD on clinical grounds. Mayer-Gross et al,[3] in their Handbook of Clinical Psychiatry, described the typical clinical presentation of VaD as follows:

> The patient with vascular dementia is in the first stages of the disease restless, very emotional, and inclined to wander at night. . . . Memory and intellectual impairment may be preceded by a caricature of one or more personality traits. . . . Drive and initiative [are] diminished, . . . yet judgement and the basic personality may be well preserved and the patient can retain remarkably good insight...leading to despondency and pessimism. . . . Depression is noticeable at some stage in almost a third of cases.

This description provided Hachinski and co-workers[4] with the basis for the Ischemic Scale (IS), a tool to assess the cerebrovascular origin of dementia. Hachinski's IS is still widely used and contains, among others, the items "depression" and "relatively retained personality."

In view of the widespread popularity of Hachinski's IS, it is assumed, apparently, that depression and preserved personality occur more frequently in VaD than in AD. Additionally, a relatively intact insight into one's deficit is also believed to be more characteristic of patients with VaD than of patients with AD.[3,4] However, there is little empiric evidence that AD and VaD can be differentiated reliably on the basis of these features. Few studies have determined whether intact insight and a preserved personality can be used to discriminate AD from VaD.

The few studies conducted on the relationship between depression and the type of dementia have yielded conflicting results. For example, depression has been found to occur more often in VaD than in AD,[6] less often in VaD than in AD,[7] or in similar frequencies.[8] It is relevant to note that for the most part, these studies included inpatients, and therefore, the results are difficult to generalize to less severely demented outpatients. Therefore, reliable data on the prevalence of clinical characteristics that differentiate between AD and VaD in relatively mild stages of dementia are virtually nonexistent.

Additionally, variations in the frequencies of occurrence of a given feature could be related to differences

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in the diagnostic criteria used. For instance, some have used Hachinski's IS to distinguish between AD and VaD.[6,9] When depression and personality are studied, the use of this scale leads to circularity, since it includes these two features. Another source of variation may stem from differences in the study samples. Some authors report that depressive symptoms occur most often in the early stages of AD[10] and in female subjects.[10,11] Moreover, the age of onset of dementia may also be an important characteristic that influences the results of comparisons of different groups.[12] Therefore, the severity of dementia, sex distribution, and age of onset should be taken into account when comparing the prevalence of depression in different groups of demented patients.

This present study addresses whether patients with VaD and patients with AD differ in the prevalence of depression, lack of insight, and personality changes. To rule out any differences attributable to variables in the related sample characteristics, we compared patients with AD to patients with VaD who were carefully matched for age, sex, and extent of dementia. The aim of this study was to examine whether or not these clinical features would help to differentiate between AD and VaD in a relatively early phase of the disease.

## PATIENTS AND METHODS

We retrospectively studied the data of all outpatients with AD and VaD who had been referred to the Maastricht Memory Clinic of the University Hospital of Maastricht, The Netherlands. In short, all patients received an extensive neuro-psychiatric and neuropsychological diagnostic assessment, also including a CT scan of the brain, and which has been described in length elsewhere.[13] All CT scans were judged by one neurologist, experienced in cerebrovascular pathology. The definite diagnosis was made by the lead author of this paper, an experienced neuropsychiatrist, after thorough discussion of the clinical findings in a weekly multidisciplinary team conference. Dementia was diagnosed according to DSM-III-R criteria[5]; Alzheimer's disease was diagnosed using the NINCDS/ADRDA criteria for possible and probable AD[14]; and the diagnosis of VaD was based on both the DSM-III-R criteria for dementia and a score of 4 or more on the modified ischemic score of Rosen and coworkers.[15] In contrast to Hachinski's original IS, the modified IS does not include the items "depression" and "retained personality."

The original group consisted of 93 patients with AD and 48 patients with VaD. Compared to the patients with VaD, those with AD were significantly younger (74.0 vs. 70.7 years; ± test, $P < .05$), and less severely demented, as measured with the Global Deterioration Scale (GDS)[16] (mean GDS scores, 4.8 and 4.3, respectively; Wilcoxon test, $df = 1, P < .02$). Therefore, we selected 48 patients from the AD group who were matched in pairs, by GDS score, age, and sex, to the 48 patients with VaD.

To avoid the problems of using an ordinal variable as a covariate, matching was preferred over the controlling and correcting for an effect of the GDS score and age by means of an ANCOVA procedure.[18] Matching was carried out by a research assistant who was blind to patient data other than these three characteristics. Forty-four of the 48 patients were matched within the same GDS score. Patients were matched for age (± 3 years), and all patients were matched for sex.

The severity of dementia was assessed by the GDS. The degree of functional impairment was measured by the dementia scale of Blessed-Tomlinson-Roth (BDS).[17] Data from CT scans of the brain were available in 40 of the patients with VaD (84%) and in 36 of those with AD (75%); the other patients refused this examination. The majority of the patients diagnosed as VaD showed signs of ischemic infarctions or severe leukoaraiosis on CT scan (83%), compared to only 8% of the patients with AD.

A distinction was made between depression, as a syndrome, and depressive symptoms. The syndrome of depression was diagnosed according to the DSM-III-R criteria for a major depressive episode, ignoring the organic exclusion.[5] Depressive symptoms were assessed using The Hamilton Rating Scale for Depression (HRSD, 17-item version).[19] The HRSD has been proven to be reliable in testing demented patients.[20]

For the purpose of this study, impaired awareness or lack of insight was defined, in accordance with Schachter,[21,22] as the absence of knowledge or recognition of cognitive deficits. Analogous to other studies, the extent of awareness was assessed by comparing the patients' and the caregivers' histories. Details about the way in which we assessed the level of awareness have been described elsewhere.[23] In short, awareness of deficits was rated on a 4-point rating scale, ranging from 4 (intact) to 1 (absent).

At the initial interview, the patient was asked why he or she had been referred. The caregiver had been asked not to make any comments before being requested to do so. Awareness was judged to be intact [awareness score (AS) = 4] when the cognitive problems were mentioned spontaneously by the patient in reply to the opening question, and when the history of the caregiver corresponded with that of the patient. When the patient commented spontaneously about his or her memory in reply to the opening question, but there were apparent discrepancies between the patient's and the caregiver's anamnesis, awareness was scored as mildly impaired (AS = 3).

Awareness was scored severely impaired (AS = 2) when the patient uttered no complaints in response to the opening question, when he acknowledged memory impairments only on explicit questioning, and when there were clear discrepancies between the patient's and the caregiver's history. When the patient denied any problems related to dementia, even when asked explicitly, awareness was scored as absent (AS = 1). The interrater reliability of this awareness score has been shown to be substantial (kappa value, 0.70).[23]

As an indication of the extent of the change in personality, the sum of the scores for the BDS subitems concerning changes in personality was calculated (BDS personality subscale, items 12–19). These eight subitems are: (1)increased rigidity; (2) increased egocentricity; (3) impairment of regard for feelings of others; (4) coarsening of affect; (5) impaired emotional control: irritability; (6) hilarity in inappropriate situa-

tions; (7) diminished emotional responsiveness; and (8) sexual misdemeanour, appearing *de novo* in old age. Each subitem could be scored as 1 (the specific personality change present for more than 6 months), or as 0 (no change, or the change present for less than 6 months). The scoring of the HRSD, the level of awareness, and the BDS was carried out by the neuropsychiatrist who investigated the patient.

### Statistical Analysis

A *t* test was used to compare both groups on the variable age. Due to the ordinal level of most of the data (GDS, HRSD, BDS, and the awareness score), nonparametric tests were used: Wilcoxon two-sample tests, analysis of variance (ANOVA) with rank sums, and Spearman's rank-order correlation coefficients ($r_s$).[18] Probability (*P*) values lower than .05 were regarded as being significant.

## RESULTS

The main patient characteristics of both groups are shown in Table 1. The two groups did not differ in the level of functional impairment (as assessed by the BDS), the duration of the dementia, or the level of education. Seventy-nine percent of the patients had (very) mild or moderate dementia, as measured by the GDS score (very mild, GDS 3: 4 AD, 5 VaD) (mild, GDS 4: 12 patients in each group) (moderate, GDS 5: 22 AD, 23 VaD) (severe, GDS 6: 10 AD, 8 VaD) (very severe, GDS 7: no patients).

Depression was twice as common in patients with VaD than in the AD patients: six with VaD and three with AD fulfilled DSM-III-R criteria for major depression. However, these numbers are too small to complete a meaningful statistical analysis. In contrast, the mean scores on the HRSD did not differ significantly between the patients with AD and those with VaD [9.4 (± 9.4) for patients with AD, and 9.1 (± 4.5) for patients with VaD; ($z = -0.16$) Wilcoxon test, NS]. An analysis of the separate items of the HRSD did not reveal differences in any of the subitems between the groups. A correlation between the severity of dementia (GDS score) and the score on the HRSD was virtually nonexistent in both groups ($r_s = .04$ and .01 for AD and VaD, respectively, NS) (i.e., mildly demented patients of both AD and VaD groups had similar depression scores compared to the more advanced stages).

The distribution of awareness scores is shown in Table 2. The awareness scores were more or less equally distributed among patients with AD and patients with VaD (Wilcoxon test, NS). The mean score on the personality subscale was 1.9 (± 1.2) for patients with AD and 1.3 (± 0.8) for patients with VaD. The scores were not statistically significantly different (Wilcoxon test).

The number of patients with depression, the Hamilton depression scores, the awareness scores, and the personality scores did not differ significantly between patients with AD or VaD when the items were analyzed separately with a rank-sum ANOVA for mild (GDS 3 and 4), moderate (GDS 5), and severe (GDS 6) dementia (Fig. 1A, B, and C).

## DISCUSSION

The results of this study suggest that the level of depressive symptoms, lack of insight, and personality changes occur in AD and in VaD with comparable frequencies. Differences between AD and VaD regarding depressive symptoms have been examined previously in four studies.[6–9] These studies examined hospitalized patients on specialized wards, whereas the patients in our study were all ambulatory. Therefore, the results of our study are difficult to compare with those of the other reports.

The two studies that used the IS of Hachinski[6,9] yielded higher depression scores in the VaD patients than in the AD patients. This may be related partly to the fact that patients with depression have an increased chance of being diagnosed with VaD when the IS of Hachinski is used. The severity of dementia of the different groups was mentioned only in two studies,[6,8] in which the patients with AD were more severely demented than were the patients with VaD. In one of these two studies,[8] the patients with AD had higher depression scores than did the patients with VaD, whereas the other study reported the opposite.[6] The study sample that showed higher depression scores in patients with VaD consisted of chronic inpatients who were, on average, 9 years older than the patients of the other study. These differences probably influenced the study outcome.

There are few studies that explicitly addressed differences in the level of awareness between these two

**Table 1. Patient Characteristics of Matched Groups**

| | *Alzheimer's Disease (n = 48)* | *Vascular Dementia (n = 48)* | *Probability* |
|---|---|---|---|
| Age | 72.9 (± 7.6) | 73.9 (± 7.7) | NS |
| Sex (M/F) | 31/17 | 31/17 | |
| GDS | 4.8 (± 0.9) | 4.7 (± 0.9) | NS |
| BDS | 7.9 (± 4.2) | 8.0 (± 4.5) | NS |
| Duration (years) | 3.28 (± 2.4) | 3.31 (± 2.1) | NS |
| Education (1–7)† | 3.6 (± 1.3) | 3.7 (± 1.5) | NS |

*mean (±standard deviation).
†Level of education according to Verhage[29]: 1, primary school; 7, university grade.
GDS = Global Deterioration Scale; BDS = Blessed Dementia Scale.

**Table 2. Distribution of Awareness Scores among Patients with AD and VaD**

| *Diagnosis* | *Awareness Score* | | | |
|---|---|---|---|---|
| | *Intact* | *Mildly Disturbed* | *Moderately Disturbed* | *Severely Disturbed* |
| AD (n = 48) | 3 (6%) | 17 (35%) | 19 (39%) | 9 (19%) |
| VaD (n = 48) | 6 (13%) | 13 (27%) | 20 (42%) | 9 (19%) |
| Total (N = 96) | 9 (9%) | 30 (31%) | 39 (40%) | 18 (19%) |

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