Diagnosis of Dementia in Primary Care: A Representative Survey of Family Physicians and Neuropsychiatrists in Germany

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Key Words

Vascular dementia · Alzheimer dementia · Primary care, dementing conditions · Diagnostic competence, family physicians/neuropsychiatrists

Abstract

Aim: To measure the diagnostic competence of family physicians (FP) and neuropsychiatrists (NP) for moderate dementia. **Methods:** Written case vignettes describing moderate dementia either of Alzheimer type or vascular type were randomized to a representative sample of 122 FP and 68 NP, corresponding to response rates of 71.8 and 67.3%, respectively. They served as the basis for a structured face-to-face interview. **Results:** NP and FP did not differ with regard to their diagnostic considerations, however, concerning diagnostic workup. Vascular dementia was much better recognized than dementia of Alzheimer type. Neuropsychological tests and brain imaging would be done by 14.8 and 32.8% of the FP in the case of vascular dementia. In Alzheimer dementia they would apply these methods in 24.6 and 19.7%, respectively. The corresponding numbers for NP were about 60% in both cases for testing and more than 80% for brain imaging. **Conclusions:** There is still a wide gap between guidelines and practice in primary care. The apparent overdiagnosis of vascular dementia may be one reason for the low drug treatment rates.

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Introduction

The increasing number of dementia sufferers is a particular challenge for primary care [1, 2]. There is wide consensus that an early diagnosis would provide patients and their caregivers the possibility to live as long as possible without the need of institutional care [3]. However, early diagnosis of dementia is not reality [4]. According to a recent European survey [5], even the general practitioners themselves agreed that the diagnosis of (Alzheimer) dementia is too often delayed.

The diagnosis of moderate dementia should attract similar interest for the following reasons: Antidementia drugs are available; however, there is a broad discussion on their clinical relevance [6–10]. Moderate dementia stages are mostly accompanied by emotional and behavioural disturbances. The adequate interaction of primary care physicians with the patients and their caregivers is important to prevent acute crises as well as nursing home admissions due to overburdening of the caregivers [11–14]. However, the prerequisite for a competent management is the recognition of the underlying condition [5, 15–17]. For the most prevalent dementias, dementia of the Alzheimer type (DAT) and vascular dementia (VD), this can be achieved ante mortem with a high accuracy, as clinicopathological studies have shown [8, 18].

In Germany, like in most other countries, family physicians (FP) are in the key position for the care of the elderly [19–21]. There is no gatekeeper system, and FP are

allowed to order any investigation (including neuroimaging) and to prescribe any drug without authorization of a specialist. All patients may approach a specialist directly. However, neurologists and psychiatrists working in private practice (neuropsychiatrists; NP) are involved much less frequently in the care of the elderly. To improve the specialized care of demented patients, the number of memory clinics, geriatric psychiatric centers, and specialized practices is increasing without covering a major share of dementia care yet [22, 23]. This situation seems to be comparable to that in other countries, where the involvement of specialists or a multidisciplinary team approach has been shown to be of advantage for the care of dementia [24–28].

For this debate, the competence of the physicians being responsible for the demented must be taken into account. Like in Germany, in many other countries geriatric and geriatric psychiatric know-how is not (adequately) included into the training curricula of FP and NP [2, 29]. Even for the NP, geriatric neurology or psychiatry training is not obligatory yet, and there is no subspecialty for geriatric psychiatry or geriatric medicine. Traditionally, experts may be specialists for neurology and/or psychiatry, and both trainings include 1 year of residency in the other discipline at minimum.

Applying various methods, studies revealed detection rates of 12–33% in mild and of 34–73% in more advanced dementia [17, 30–35]. Other investigators showed that low knowledge as well as dementia-related ‘nihilistic’ attitudes affect detection rates and case management [16, 36–38]. However, diagnostic assessment and disclosure of the results both need skills on the part of the physicians. Also, being sceptical on the impact on outcome, many hesitate to get into a diagnostic workup. This attitude is often shared by patients, caregivers, and the public [16, 21, 39–43].

In 1993, we performed a representative survey on FPs’ competence for the management of memory disorders in Lower Saxony [44, 45]. We applied standardized written exemplary case vignettes in face-to-face interviews in the physicians’ practices. Two written case samples were presented to 145 FP, one of them describing a patient with slight memory complaints without any vascular risk factors or physical comorbidity and the other one a patient suffering from common somatic disorders in late life and moderate dementia of either vascular or Alzheimer type. Based on a structured interview, diagnostic and differential diagnostic considerations were recorded and statistically evaluated, allowing future follow-up surveys. The study revealed a distinct underdiagnosis of dementia.

Moreover, in the case with slight memory complaints, 36.6% of the FP came to the diagnosis of ‘vascular encephalopathy’, even if no hints pointing to cerebrovascular disease were apparent.

In the following years specifically acting cholinesterase inhibitors for the exclusive treatment of DAT had been introduced. Their rollout attracted considerable public attention and was accompanied by substantial training efforts aiming at physicians dealing with dementia.

The present study was conducted to verify the resulting assumption that primary care competency in early diagnosis of dementia may have changed during the period of 1993–2001. We also wanted to see whether aetiological concepts of dementia would have changed from predominating vascular to rather degenerative origin. In 1993, we included a small number of NP ($n = 14$) in private practice serving as orientation for the group of specialists. Because the above-mentioned debate on the necessity of involving specialists into the primary care management of the elderly, we were interested in a larger group for comparison purpose in 2001.

Methods

The study was approved by the Ethics Committee of the University of Göttingen, Germany (Ref. 10/12/00). Two trained investigators (A.K. and S.H.) performed an interview training and validated whether the formerly applied answer categories dating from 1993 had to be updated. Then, according to the list of physicians obtained by the Board of Physicians of Lower Saxony and Hessen, both interviewers addressed to all FP maintaining private practices in the cities of Göttingen, Northeim, and their closer vicinity. Both municipalities are situated in southern Lower Saxony. Göttingen is a university town with approximately 125,000 inhabitants, whereas the 40 km distant Northeim is smaller. To achieve relevant numbers for the NP, the recruitment area for them was larger and included also the neighbour cities of Hannover, Hildesheim, and Kassel. The doctors were asked for a standardized face-to-face interview regarding their management of cognitive decline in elderly patients. We chose this mode of questioning to ensure satisfying collaboration. Standardized open questions could be posed without disclosing any answer categories. Consequently, answers induced by a questionnaire could be avoided. In case the request was rejected, our investigators tried to get the statistical data of the physician and the practice by phone (medical qualification, age, gender, number of patients, etc.). Physicians consenting to an interview likewise answered the statistical questionnaire as a first step. Then, to each participating doctor, two randomly assigned case vignettes were presented by the interviewers. This approach had been formerly shown to adequately predict *de facto* decisions [46]. To ensure comparability, the case vignettes were almost identical to those presented in our previous survey dating from 1993 [44].

This paper focuses on the diagnosis of moderate dementia. This was described in the cases presented as the second ones, A and B. Both concerned a female patient suffering from moderate dementia and common disorders typical for old age; however, A pointed to a primarily vascular aetiology, whereas B described the characteristics of DAT. As compared with the situation in 1993, case 2 was modified with regard to drug therapy, as an angiotensin-converting enzyme inhibitor replaced the treatment with digoxin and a diuretic. The text of the case vignettes is as follows:

Common for A and B: A 70-year-old woman, whom you have known for several years, presents at your clinic accompanied by her daughter-in-law. She suffers from adiposity (75 kg body weight and 160 cm height), hypercholesterolaemia (values of about 300 mg/100 ml), and type II diabetes which is well managed with oral antidiabetics. Her arthrosis is treated occasionally, depending on the presence of symptoms. Because of a myocardial insufficiency and arterial hypertension (blood pressure approximately 200/100 mm Hg) you treat her with an angiotensin-converting enzyme inhibitor.

Case A: Two years ago, the patient experienced an acute loss of hearing; 1 year ago, she had a transitory weakness of the right arm. Since then, she has complained of diffuse dizziness, headache, a declining ability to concentrate, and a worsening memory. Her daughter-in-law tells you that recently she has often been delirious during the night and has wandered through the house. The patient has also misplaced her purse or other items on several occasions and put the blame on others. Her daughter-in-law remembers that the patient's deterioration occurred stepwise. There have also been periods, however, during which she behaved as before. The patient lives in her own apartment within her son's house. Her husband died 5 years ago. Your examination reveals disorientation to time and, to some degree, to place. Neurological examination reveals a slight right-sided accentuation of tendon reflexes in the upper extremities.

Case B: The patient complains about progressive concentration and memory deficits. This began about 2 years ago and progressed continuously. She has become increasingly insecure, as she is unable to process new information or solve new problems on her own. Her daughter-in-law reports that she often leaves the oven on, misplaces items, and that she has become less active. Conversation has become more and more difficult, because she has difficulty in finding words and repeats the same question 5 min later. The patient lives in her own apartment within her son's house. Her husband died 5 years ago. Your examination reveals disorientation to time and, to some degree, to place. Neurological examination reveals no remarkable pathology.

The case vignettes follow the clinical descriptions of moderate dementia according to the criteria of DAT and VD of the ICD-10 [47]. After reading the written case presentations, the participating physicians were asked standardized questions regarding their potential diagnostic management. Any answers obtained were categorized to facilitate the interpretation of data. Like in 1993, the term 'vascular encephalopathy' was employed, when the patient was diagnosed as non-demented and the symptoms were nonetheless attributed to vascular aetiology.

In this paper, responses to the following questions will be discussed: What disorder do you think the patient has (primary diagnosis, one answer possible)? What is your differential diagnosis (multiple answers possible)? What would be your diagnostic workup? Would you refer this patient to a specialist?

Statistics

A chi-square test was used to compare A and B versions of the case vignettes, FP and NP, male versus female, and junior versus senior physicians. Although the same geographic region was investigated, and many physicians had participated in the previous survey, there were almost no physicians who spontaneously remembered the former investigation. Results were regarded as significant at a level of $p < 0.05$. Because of the exploratory character of the study, a correction for multiple comparisons was not done.

Results

Of 196 FP in the study region, 26 had to be excluded, because they were no more practicing or were treating a special clientele. 122 of the 170 remaining FP (71.8%) agreed to participate. There was a significant difference between the group of participants and non-participants regarding the type of private practice, as 66.4% of the participants but only 43.8% of the rejecting physicians were practicing alone. Age, sex, number of patients, additional qualifications, and rural versus urban locations seemed to be without influence on the readiness in participating, so that the criteria for a representative study were met.

For the NP, 64 of 165 were excluded, because they did not see elderly patients in their practice due to a distinct specialization. 68 of 101 (67.3%) agreed to participate in the study. Responders and non-responders did not differ with regard to any of the parameters mentioned above. Thus criteria for a representative study were reached.

54.4% of the NP were male, 94% ran their private practice in the cities, 61.8% in single practices. The number of patients per practice was told to be < 600 , between 600 and 1,000, and $> 1,000$ per quarter of a year, respectively, by about one third of the NP each. The data for the FP differed mostly with regard to practice size and location. 55.7% were male, 50% were practicing on the countryside. More than 50% had between 600 and 1,000 patients per quarter of a year, 32.8% reported, the number would be $> 1,000$, and only 8.6% said it was < 600 . The amount of retired patients was between 21 and 50% in most of the practices (71.8%). 41.2% of all physicians presumed to be interested in geriatric (psychiatric) topics.

Regarding the primary diagnosis (most probable disease) in case A, which described a moderate VD, most physicians 'voted' correctly. However, also in case B, which described a typical clinical course of DAT in a patient with some common physical disorders, VD was the diagnosis which was considered most often by both physician groups for primary diagnosis. There was a trend

Table 1. Primary diagnosis in case A, corresponding to vascular dementia (VD), and case B, describing moderate dementia of the Alzheimer type (DAT)

	Case A (VD)				Case B (DAT)			
	NP		FP		NP		FP	
	n	%	n	%	n	%	n	%
No disease	0	0	0	0	0	0	0	0
DAT	0	0	1	1.6	6	17.6	14	22.9
VD	28	82.4	49	80.3	23	67.6	32	52.5
Vascular encephalopathy	6	17.6	7	11.5	2	5.9	7	11.4
Extracerebral disorder	0	0	0	0	0	0	4	6.6
Others	0	0	4	6.6	3	8.9	4	6.6
Total	34	100	61	100	34	100	61	100

The term vascular encephalopathy was used, when the dementia was not diagnosed, the symptoms, however, were explained by disturbances of cerebral perfusion. NP = Neuropsychiatrists; FP = family physicians. There were no significant differences found between the physician groups with regard to the answers.

that FP regarded DAT even more often. Detailed data are given in table 1.

Differential diagnostic considerations cover a wider spectrum of disorders. If primary diagnoses are added, the resulting data reflect this spectrum. In both cases VD is the most frequent diagnosis. There were no statistical differences between NP and FP regarding the three major diagnoses DAT, VD, and vascular encephalopathy. Both groups, however, considered DAT highly significantly more often in case B ($p < 0.001$). There was a trend that the FP considered physical disorders like myocardial insufficiency or diabetes mellitus more often than the NP who preferred psychiatric and/or cerebral differential diagnoses. These differences were significant for case B. There were no differences with regard to physicians' age; however, a significant difference with regard to physicians' sex. Female FP considered significantly more often metabolic disorders for the differential diagnosis in case B ($p = 0.002$), and there was a trend ($p = 0.06$) to consider cardiovascular disorders more frequently in case A. Table 2 provides details for the differential diagnostic considerations.

With regard to the diagnostic evaluation, NP differed significantly from FP, as shown in detail in table 3. NP mentioned significantly more often the need for an informant's report, neuropsychological screenings and tests for dementia, screening for depression, electroencephalography and neuroimaging. In contrast, FP would perform electrocardiography, blood pressure measurement, and blood analysis significantly more often. However,

there were no significant differences with regard to the A and B versions of the case. Exact data are given in table 3. The explicit question, whether the FP would refer this patient to a specialist, was answered with yes by 78.7% in case A and by 83.6% in case B.

Discussion

The method of combining written exemplary case vignettes with a face-to-face interview has been used and discussed previously by our group [44, 45]. Again, we could show that criteria for a representative survey can be reached by the considerable high response rates of 71.8 and 67.3% for FP and NP, respectively, and the proof of no relevant differences between participants and those who rejected participation. Nevertheless, the question may arise on whether our results achieved in the geographical centre of Germany may be generalized to the whole country. On the other hand, since pre- as well as postgraduate education of all physicians follows comparable standards, there is no plausible cause of assuming regional differences. Thus, to our knowledge, our survey presents the first representative data regarding German FP and NP competency with respect to dementia management.

The case vignettes describe a female patient with common physical disorders of old age who is on continuous drug therapy. We chose a female patient, because about 70% of all demented patients in our country are women

Table 2. Differential diagnostic considerations for case A (VD) and case B (DAT)

	Case A (VD)		Case B (DAT)	
	NP	FP	NP	FP
Number	34	61	34	61
No disease	0 (0)	1 (1.6)	0 (0)	2 (3.3)
Dementia of Alzheimer type (DAT)	4 (11.8)	15 (24.6)	24 (70.6) [”]	39 (63.9) [#]
Vascular dementia (VD)	31 (91.2)	61 (100)	34 (100)	54 (88.5)
Other dementias	2 (5.9)	8 (13.1)	15 (44.1) [”]	15 (24.6) [#]
Vascular encephalopathy	12 (35.3)	19 (31.1)	9 (26.5)	14 (23)
Depression	3 (8.8)	2 (3.3)	6 (17.6)	6 (9.8)
Other psychic disorders	1 (2.9)	1 (1.6)	2 (5.9)	2 (3.3)
Other cerebral disorders	16 (47)	14 (23) [*]	7 (20.6)	8 (13.1) [*]
Thyroid dysfunction	2 (5.9)	7 (11.5)	3 (8.8)	9 (14.8)
Vitamin deficiency	0 (0)	0 (0)	0 (0)	1 (1.6)
Renal insufficiency	1 (2.9)	1 (1.6)	2 (5.9)	3 (4.9)
Diabetes mellitus	4 (11.8)	11 (18)	3 (8.8)	23 (37.7) [*]
Myocardial insufficiency	2 (5.9)	11 (18)	2 (5.9)	18 (29.5) [*]
Cardiac arrhythmia	2 (5.9)	4 (6.6)	1 (2.9)	10 (16.4)
Liver disease	0 (0)	1 (1.6)	0 (0)	2 (3.3)
Alcohol-related disorders	1 (2.9)	3 (4.9)	0 (0)	3 (4.9)
Drug (side) effects	1 (2.9)	2 (3.3)	0 (0)	1 (1.6)
Others	1 (2.9)	0 (0)	0 (0)	0 (0)

Primary diagnoses are included. The numbers do not add to 100%, because more than one vote was possible. The term vascular encephalopathy was used, when the dementia was not diagnosed, the symptoms, however, were explained by disturbances of cerebral perfusion. NP = Neuropsychiatrists; FP = family physicians.

Asterisks indicate significant differences between NP and FP; significant differences between A and B for the NP are indicated by quotation marks, those between A and B for the FP by bar gates. $p < 0.05$. Figures in parentheses are percentage.

Table 3. Diagnostic workup (%) for case A (vascular dementia;VD) and case B (dementia of Alzheimer type; DAT)

	Case A (VD)		Case B (DAT)	
	FP (n = 61)	NP (n = 34)	FP (n = 61)	NP (n = 34)
History taking	68.8	70.6	68.9	70.6
Informant's report	27.9	47 [*]	26.2	55.9 [*]
Physical examination	60.6	70.6	52.5	70.6
Neuropsychological screening or testing	14.8	61.8 [*]	24.6	58.8 [*]
Depression screening	0	14.7 [*]	1.6	11.8 [*]
Electrocardiography	60.6	14.7 [*]	55.8	2.9 [*]
Electroencephalography	11.5	76.5 [*]	6.5	73.5 [*]
Blood pressure measurement	62.3	14.7 [*]	54.1	2.9 [*]
Brain imaging	32.8	82.4 [*]	19.7	94.1 [*]
Blood analysis, performed by FP		52.9		50
Blood analysis	82	2.9 [*]	67.2	2.9 [*]

The numbers do not add to 100%, because more than one vote was possible.

FP = Family physicians; NP = neuropsychiatrists. Asterisks indicate significant differences between NP and FP: $p < 0.05$.

[48]. So we cannot comment on gender differences which have been reported in a study from Finland [34], showing lower documentation rates of dementia in males. The clinical descriptions correspond to the most prevalent forms, DAT and VD. Both conditions show an increasing overlap with rising age. It could be demonstrated that incidence and prevalence of VD might be reduced by targeting the vascular risk factors and that this might also reduce the frequency of DAT [8, 49–51].

Meanwhile, the diagnosis of moderate dementia seems to be no major problem for both physician groups any more. This holds especially true for the diagnosis of VD. If we compare the answers of the FP in 1993 and 2001, the rate has nearly doubled from 48.7 to 100% (case A) and from 28.4 to 88.9% (case B) in those who considered VD for differential diagnosis. Just in contrast, there was no increase in differential diagnostic considerations of DAT by the FP in both cases, with 21.8% (case A) and 50.6% (case B), respectively, in 1993. The vascular concept of cognition shows a considerable stability with time. This corresponds to another German survey which by use of questionnaires showed that about three quarters of the 563 participating physicians would diagnose VD much more often than DAT [36, 52].

Since most other studies focused on DAT diagnosis or on dementia in general, respective data are difficult to compare, especially as a chart review or documentation habits might differ from answers in face-to-face interviews. To our opinion, the latter might reflect diagnostic considerations more accurately. Nevertheless, the rates of dementia diagnoses are perhaps higher than those of 34.8% for moderate dementia in a US study [33] or of 46% in a Finnish study [34]. Like in these and other studies [32, 35], we also found a higher rate of dementia diagnoses with increasing symptom severity. The finding that the NP are not superior to the FP with regard to recognition of dementia corresponds to the only other study on this topic we found, coming from Hongkong [53].

With regard to the diagnostic evaluation, the answers do not differ concerning the type of dementia, however significantly regarding physicians' specialty. Informant's interview, neuropsychological screens and tests, and neuroimaging would be applied more often by the NP, thus showing a better adherence to current dementia guidelines than the FP [54]. However, even guidelines developed for FP in Germany recommend at least the application of screening instruments like the Mini-Mental State Examination and the Clock-Drawing Test [22, 55]. And other international guidelines recommend screening, when dementia is suspected, too [35, 36, 56]. About one

third of the FP mentioned such tests for their workup. This corresponds to the results of a Finnish and US American studies [15, 34, 57]. Neuroimaging would be applied even more seldom than screening tests, although brain computed tomography or magnetic resonance imaging is obligatory for the diagnosis just of VD [58]. And for patients younger than 80 years, there are also recommendations to include neuroimaging into the workup [54, 59, 60]. On the contrary, electroencephalography is mentioned by most NP which might be a German particularity, since exclusively German guidelines include(d) this investigation [54]. The potential referral rate from the FP to the NP is considerably high. It is even higher than the rates of 30–40% which other European groups found in their studies [34, 52] and much higher than about 6% reported from an US American study [33].

Whether the better guideline adherence of the NP leads to better results and treatment cannot be answered by our study. Other studies consistently showed lower rates of drug treatment than of diagnosis, but diagnosis was undoubtedly the prerequisite for treatment [5, 17, 33]. The high rate of VD diagnoses might be an additional explanation for the low rates of, e.g., cholinesterase inhibitor treatment, because these substances are licensed just for DAT.

At last, the facts that only every 2nd FP considered DAT for differential diagnosis and that only every 5th of them would apply a dementia test should lead to more efforts in (postgraduate) education in geriatric psychiatric and medicine. This applies also to the NP who only exceptionally had a special training for dementia or geriatric psychiatry or neurology. It could be interesting to study dementia experts with this method, too.

Since we did not find even a trend that younger physicians performed better, the current efforts seem not to be sufficient. This is supported by other studies clearly showing that the (subjective) competence concerning treatment and organization of therapy was even lower than that for diagnosis or recognition [3, 16, 21, 31, 33, 36].

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