Utilization of neurologists and psychiatrists in people with dementia in primary care, factors associated with utilization and the role of imaging

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1. Background

Approximately 1.5 million people with dementia (PWD) are living in Germany today, with a rising tendency. With an ever-growing life-expectancy and a close association for comorbidities with age, GPs and specialists are challenged in many ways. Apparently, there is no shortage for doctors to be expected but we know that 20 % of the 65 years-old and older are so-called over-utilizers of specialists which decreases the visits per patient. We developed the idea to test a tool for GPs enabling them to rank suspected PWD using MR-images of the brain. Many benefits arise of using MR-images of PWD.

2. Methods

Data from the DelpHi-study. The PWD were divided into 2 subgroups according to whether they had been sent to a specialist versus not been sent. Next, we described the key-factors of PWD that lead to being sent to a specialist by their GP. We applied various testing models including Chi² and logistic regression. We also requested imaging data of the patient´s file and analyzed MR-imaging using the Scheltens Score. The Scheltens Score focuses on the hippocampus' atrophy and rates them on a scale from 0 = healthy to 4 = very severe. We tested this tool by 2 advanced medical students and compared our anatomy-pathology analyses of the MR-images of the brain with cognitive testing results of the MMSE.
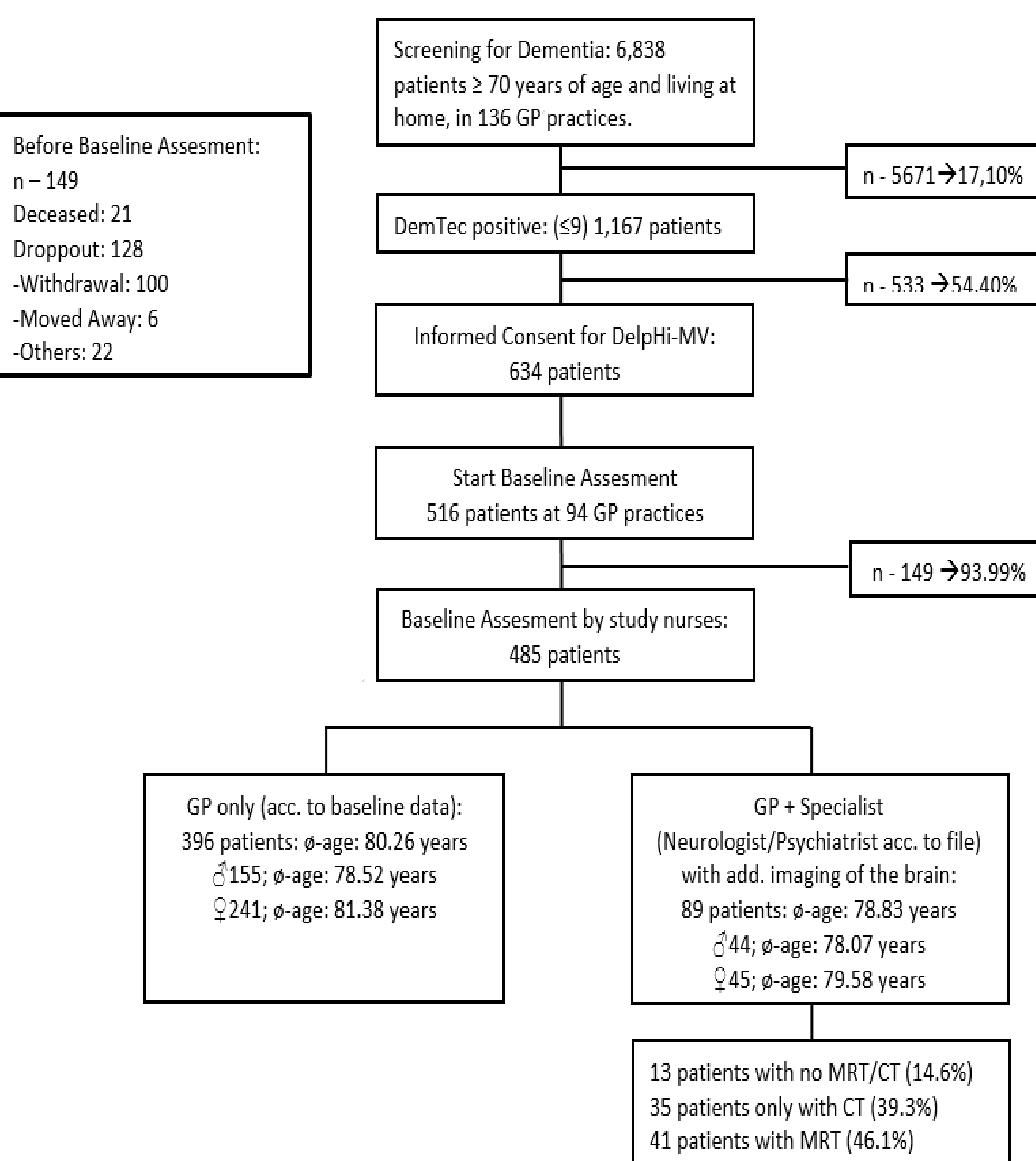

Before Baseline Assesment:
n – 149
Deceased: 21
Droppout: 128
-Withdrawal: 100
-Moved Away: 6
-Others: 22

Screening for Dementia: 6,838 patients ≥ 70 years of age and living at home, in 136 GP practices.

n - 5671→17,10%

DemTec positive: (≤9) 1,167 patients

n - 533 →54.40%

Informed Consent for DelpHi-MV: 634 patients

Start Baseline Assesment 516 patients at 94 GP practices

n - 149 →93.99%

Baseline Assesment by study nurses: 485 patients

GP only (acc. to baseline data):
396 patients: ø-age: 80.26 years
♂155; ø-age: 78.52 years
♀241; ø-age: 81.38 years

GP + Specialist (Neurologist/Psychiatrist acc. to file) with add. imaging of the brain:
89 patients: ø-age: 78.83 years
♂44; ø-age: 78.07 years
♀45; ø-age: 79.58 years

13 patients with no MRT/CT (14.6%)
35 patients only with CT (39.3%)
41 patients with MRT (46.1%)

Chart 1 Flow Chart of the DelpHi Study cohort analyzed in this paper
Legend: MV= Mecklenburg Western Pomerania
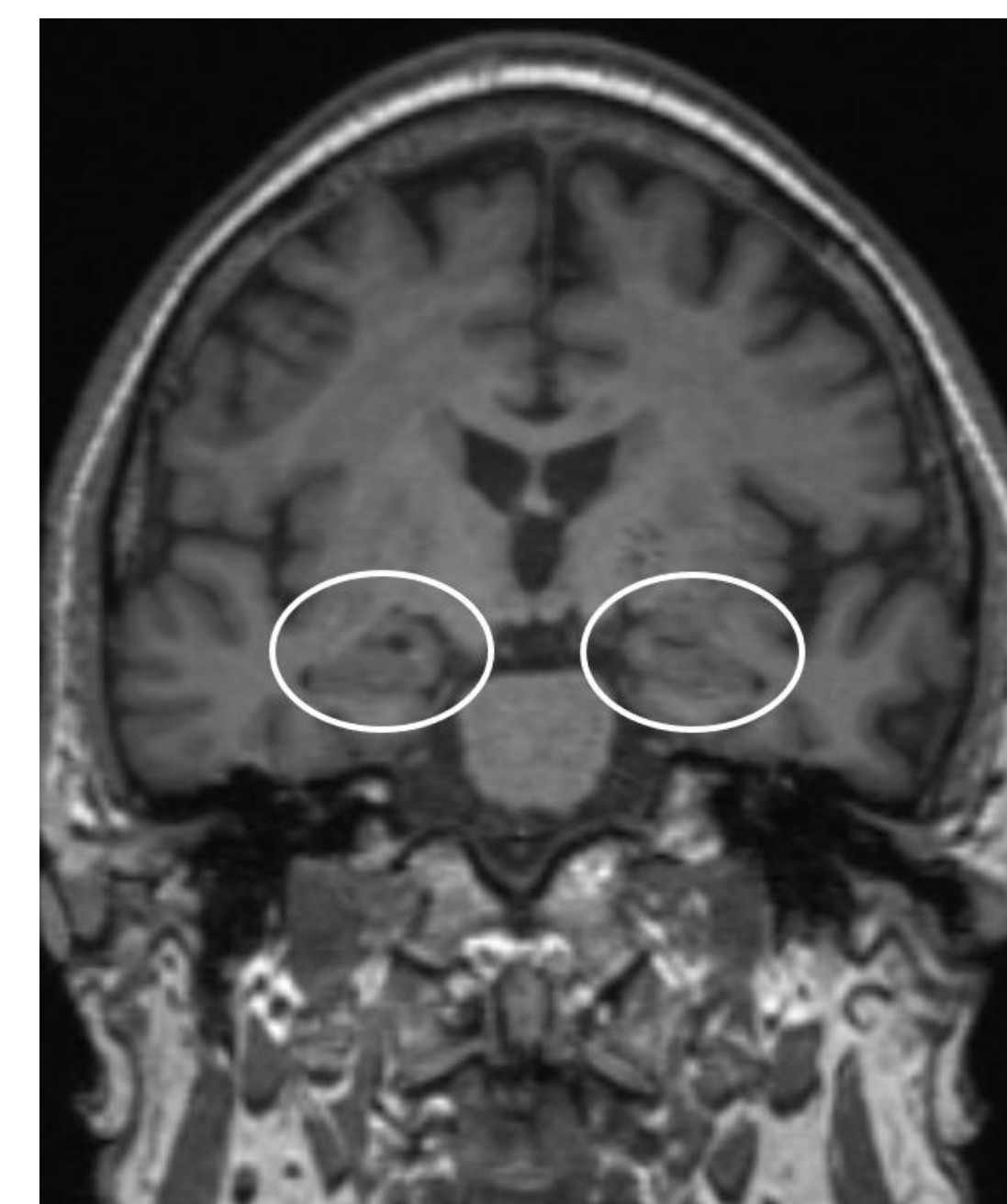
MR of healthy brain: Scheltens 0
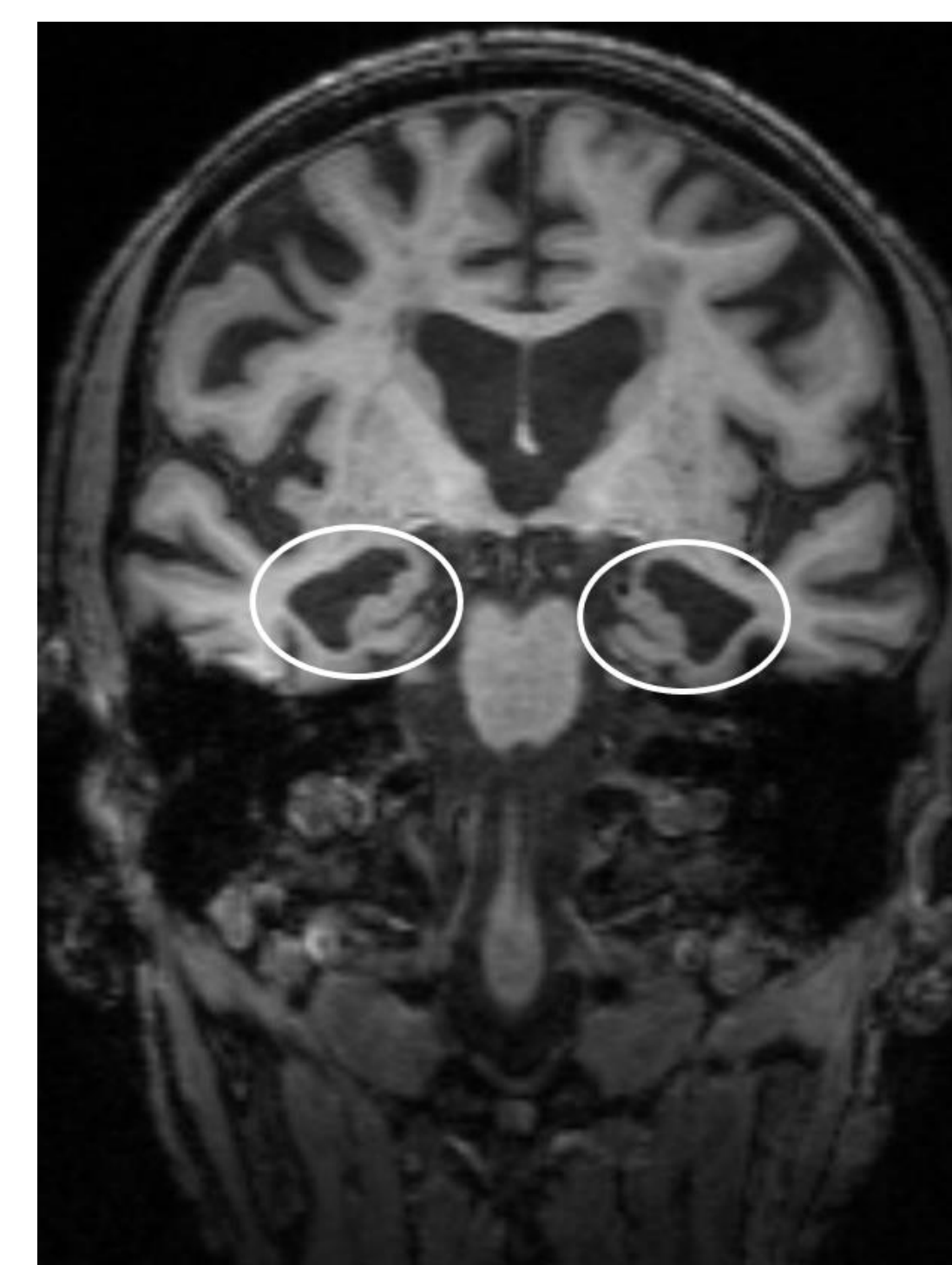
MR of atrophical brain; Scheltens 4

3. Results

According to the Logistic Regression formulae only B-ADL and age are statistically significant as a key-factor in being referred to a specialist by the GP. We found out that if the B-ADL value rises by one unit, it increases the patient´s relative frequency to be sent to a specialist by 15.2%. Also, if the patient´s age rises by one unit the relative frequency decreases by 5.2% to be sent to a specialist. Only 18.35% (89 of 485) of the PWD were referred to a specialist by their GP which challenged us to design a model to improve the appliance of the guidelines for the benefit of suspected PWDs. When comparing our ratings of PWDs with their cognitive testing results, we found an interesting mismatch affecting almost half (47.4%) the patients in our study group as shown below:

Variable	OR	95% CI	Significance = p-value
Mean age of patient	0.948	0.90 – 0.99	* 0.04
B-ADL	1.152	1.02 – 1.30	* 0.02
Sex	0.90	0.53 – 1.54	n.s.
Partnership status	1.28	0.74 – 2.22	n.s.
MMST	0.99	0.95 – 1.05	n.s.

Logistic Regression regarding a specialist visit. Abbreviations: OR: Odds Ratio; CI: Confidence Interval; B-ADL Bayer Activity of Daily Loving; MMST: Mini Mental State Test(Examination)

			Atrophy of hippocampus acc. to Scheltens Score 1 - 4				Overall
	MMSE Score		small	medium	severe	very severe	
Cognitive testing by GPs	No hint for dementia (30)	% within grade of dementia	5.3%	7.9%	10.5%	0%	23.7%
	Mild dementia (20-30)	% within grade of dementia	15.8%	13.2%	7.9%	5.3%	42.2%
	moderate dementia (10-19)	% within grade of dementia	7.9%	7.9%	10.5%	2.6%	28.9%
	severe dementia (0-9)	% within grade of dementia	0%	5.3%	0%	0%	5.3%
Total			28.9%	34.2%	28.8%	7.9%	100%

MMST by Scheltens Score; Legend: MMSE: Mini Mental State Examination; Scheltens 1: small atrophy of the Hippocampus; Scheltens 2: medium atrophy of the Hippocampus; Scheltens 3: severe Atrophy of the Hippocampus; Scheltens 4: very severe atrophy of the Hippocampus

4. Conclusions

The utilization of specialists of the neuro-psychiatric professions according to the guidelines must be increased. Appliance of additional tools such as the Scheltens Score by GPs might be a promising way of facing a supposedly coming shortage of specialists. The tools are not only of benefit in terms of ranking patients regarding their urgency to see a specialist but also in order to find those 5 % who have a reversible kind of dementia. The tested tools are reasonable easy to learn, show a high consistency in regular application and do not require any further expensive hard- or software. In addition, MR-imaging helps to identify the type of dementia and enhance an individual therapy as early as possible. However further research needs to be undertaken to minimize the impressive mismatch between cognitive testing and brain-imaging of PWD.

Limitations: Appliance of the Scheltens Score only focuses on the worse of the two hippocampi, however the better and less atrophic hippocampus might still be well enough to compensate.

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