website extra

Additional information appears on the Evidence-Based Mental Health website

www.ebmentalhealth.com

Diagnosis

Review: most laboratory tests do not add to the diagnostic accuracy of clinical criteria for dementia

Knopman DS, DeKosky ST, Cummings JL, et al. Practice parameter: diagnosis of dementia (an evidence-based review). Report of the Quality Standards Subcommittee of the American Academy of Neurology. *Neurology* 2001 May 8;56:1143–53.

QUESTIONS: Are current diagnostic criteria accurate for diagnosing prevalent dementias in the elderly? Do laboratory tests improve the accuracy of the clinical diagnosis of dementia?

Data sources

Studies were identified by searching electronic databases and reference lists and contacting experts.

Study selection

English language studies on the diagnosis of dementia in humans were selected. Studies on Alzheimer's disease (AD) were selected if they included >25 patients.

Data extraction

The quality of studies was rated. Data were extracted on diagnostic precision.

Main results

Clinical criteria: the table shows the results. **Laboratory tests:** a study showed that a minimum width of the medial temporal lobe below the 5th percentile was 95% sensitive but 40% specific for detecting AD. In 5 studies of medial temporal lobe atrophy, sensitivity ranged from 77–92% and

specificity from 49–95% for detecting AD. The sensitivity for single-photon emission computed tomography (SPECT) was not higher than that for clinical criteria. For differentiating AD from non-AD dementia, 2 studies showed sensitivities of 86% and 95% and specificities of 42% and 73%. Positron emission tomography (PET) had a sensitivity of 93% and specificity of 63% for detecting AD in 1 study. PET had better diagnostic accuracy than SPECT for detecting AD (87.2% v 62.9% for Mini-Mental State Examination [MMSE] score >20 and 100% v 81.2% for MMSE score <20). **Genetic biomarkers:** 1 study showed that the presence of apolipoprotein E (APOE) ε4 increased the positive predictive value of the AD diagnosis from 90% to 94%. In patients with non-AD, the absence of APOE ε4 increased the negative predictive value from 64% to 72%. **Cerebrospinal fluid (CSF) markers:** studies showed that the CSF markers (β amyloid_{1–42}, tau, and AD7C protein) have moderate to high sensitivity and specificity for detecting AD, but it is unclear whether their combined use is better than a competent clinical diagnosis. 2 studies showed that an immunoassay for the detection of the 14-3-3 protein in CSF had a sensitivity of 99% and 94% and a specificity of 96% and 93% for detecting Creutzfeldt-Jakob disease.

Conclusions

Clinical criteria for probable Alzheimer's disease, dementia of the Alzheimer type, and Creutzfeldt-Jakob disease (CJD) have diagnostic accuracy sufficient for routine use. The cerebrospinal fluid 14-3-3 protein assay is useful for confirming the diagnosis of CJD. No other laboratory test improves diagnostic accuracy.

Source of funding: no external funding.

For correspondence: Dr D S Knopman, Department of Neurology, Mayo Clinic, 200 First St SW, Rochester, MN, 55905, USA. knopman@maroon.tc.umn.edu.

Diagnostic accuracy of criteria for assessing dementia*

Outcomes	Criteria	Number of studies	Mean sensitivity (range)	Mean specificity (range)
DAT	DSM-III-R	3	81% (49–100)	70% (47–100)
Probable AD	NINCDS-ADRDA	10		
Possible AD		4	93% (85–96)	48% (32–61)
Vascular dementia	NINDS-AIREN	1	43%	95%
	HIS/DSM-III R/NINCDS-AIREN/California	4	50% (20–89)	87% (64–98)
Dementia with Lewy bodies (DLB)	Consortium for DLB diagnostic criteria	1	22% 58% (34–75)	100% 87% (71–94)

*DAT=Dementia of the Alzheimer type; AD=Alzheimer's disease; HIS=Hachinski Ischemic Score.

COMMENTARY

Dementia, a common mental health syndrome, affects approximately 5–10% of people ≥65 years of age. This diagnosis has important implications for patients, their families, and society in general. Hence, clinicians who care for older adults should be fully aware of currently available diagnostic criteria, their reliability and validity, and which tests may improve diagnostic accuracy.

The American Academy of Neurology has put together a distinguished group of professionals to systematically review recent advances in the diagnosis of dementia. The Committee concluded that the DSM-III-R, DSM-IV, and NINCDS-ADRDA criteria for dementia have good reliability. The authors did not describe any studies testing the reliability of the ICD-10 definition of dementia. This omission is unfortunate because the ICD-10 is used internationally.

The Committee further concluded that the NINCDS-ADRDA or DSM-III-R criteria for AD should be used routinely, even though a high sensitivity for the diagnosis is often achieved at the expense of low specificity. NINCDS-AIREN and DSM-III-R criteria for vascular dementia lack sensitivity and, in clinical practice, the Hachinski Ischaemic Score may be more useful. Currently available criteria for dementia with Lewy bodies (DLB) fail to reliably discriminate DLB from AD. The Lund-Manchester criteria for frontotemporal dementia seem to have good sensitivity and specificity, but information is sparse.

Structural or functional neuroimaging fails to significantly improve the accuracy of the clinical diagnosis, although structural MRI or CT is recommended as part of the initial evaluation of patients with dementia. Genetic testing and CSF markers are not appropriate for routine use (except for the 14-3-3 protein for CJD). The Committee recommended that all patients who are assessed for dementia should be screened for the presence of depression, vitamin B12 deficiency, and hypothyroidism. This advice may be controversial because the prevalence of B12 deficiency and hypothyroidism in dementia services is relatively low and unlikely to be the cause of dementia—screening for folate deficiency may be more clinically relevant.

This review provides a wealth of information on issues related to the diagnosis of dementia that will be useful to clinicians and researchers. However, it is disappointing to note that we have not gained much ground since the practice parameter was first published in 1994.

Oswaldo P Almeida
University of Western Australia; Perth, Western Australia, Australia