Clinical criteria for three types of dementia had low sensitivity and high specificity

Holmes C, Cairns N, Lantos P, et al. *Validity of current clinical criteria for Alzheimer's disease, vascular dementia and dementia with Lewy bodies. Br J Psychiatry* 1999 Jan;174:45–50.

Questions

How valid are the following diagnostic criteria: (1) the NINCDS-ADRDA criteria for Alzheimer's disease (AD); (2) the NINDS-AIREN criteria for vascular dementia (VaD); and (3) the consensus criteria for dementia with Lewy bodies (CDLB) for dementia with Lewy bodies (DLB)? Do prevalence rates and copathology compromise these criteria?

Design

Blinded comparison of the resulting diagnoses using the NINCDS-ADRDA criteria, the NINDS-AIREN criteria, and the CDLB with the diagnostic standard, postmortem examination.

Setting

Community based in the UK.

Patients

The first 80 patients (58% women) from the Camberwell Dementia Case Register to come to postmortem (mean age at death 82 y).

Description of tests and diagnostic standard

Clinical diagnosis was made independently by 2 psychiatrists, blind to postmortem findings. Diagnostic criteria of the

NINCDS-ADRDA for AD, the NINDS-AIREN for VaD, and the CDLB for DLB were used.

Main outcome measures

Sensitivity, specificity, and positive and negative predictive values.

Main results

38 patients (48%) fulfilled NINCDS-ADRDA criteria for probable AD, 7 (9%) fulfilled NINDS-AIREN criteria for probable VaD, and 2 (3%) fulfilled CDLB for probable DLB. 27 patients (34%) had mixed pathology. The table shows sensitivity, specificity, and positive and negative predictive values of the tests.

Conclusions

Clinical diagnostic criteria for Alzheimer's disease, vascular dementia, and dementia with Lewy bodies had low sensitivity and relatively high specificity. Approximately one third of patients had mixed pathology.

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*Sensitivity, specificity, and positive and negative predictive values for clinical diagnosis compared with postmortem examination**

Clinical diagnosis	Detected neuropathology	Sensitivity (95% CI)	Specificity (CI)	PPV (CI)	NPV (CI)
NINCDS probable	Neuritic plaques alone	66% (50 to 80)	75% (58 to 88)	76% (59 to 89)	64% (48 to 78)
	Neuritic plaques alone and with other pathologies	50% (37 to 62)	70% (35 to 93)	92% (78 to 98)	17% (7 to 31)
AIREN probable	Infarctions alone	43% (10 to 82)	95% (87 to 98)	43% (10 to 82)	95% (86 to 98)
	Infarctions alone and with other pathologies	30% (13 to 53)	100% (94 to 100)	100% (59 to 100)	78% (67 to 87)
DLB probable	Lewy bodies alone and with neuritic plaques	22% (3 to 60)	100% (95 to 100)	100% (16 to 100)	91% (82 to 96)
	Lewy bodies alone and with other pathologies	16% (2 to 48)	100% (95 to 100)	100% (16 to 100)	87% (77 to 94)

*PPV = positive predictive value; NPV = negative predictive value.

Commentary

This study by Holmes *et al* addresses the correspondence between clinical and pathological criteria for AD, VaD, and DLB. This work is reminiscent of a study by Litvan *et al* in which raters used data from 15 cases pathologically proved to have Parkinson's disease, 14 with DLB, and 76 with neither.¹ For DLB, as in the present study, sensitivity was low and specificity was high. Mixed pathologies were considered in the context of parkinsonian syndromes, and inter-rater reliabilities were also considered. For AD, Nagy *et al* found high sensitivity (91–98%), low specificity (40–61%), and low negative predictive values for both the NINCDS-ADRDA and DSM-III-R criteria.² The higher sensitivity found might have been from having less mixed pathology. For VaD, comparisons between NINDS-AIREN criteria and 3 other current criteria showed poor con-

cordance, again perhaps reflecting the problem of mixed disease discussed by the present authors.³

Clinicians should appreciate the current work because it stresses the importance of (1) recognising disease prevalence, (2) appreciating the complexity introduced by mixed pathology, and (3) encouraging the clinician to consider the patient's values in tactfully informing the patient, or the patient's family, about the possibility of false positives and negatives when proceeding from a differential diagnosis to a provisional diagnosis. Although physicians should be cognisant of these and other diagnostic guidelines, this study does not support shifting the standard of care from the currently recommended one (general medical, neurological, and psychiatric assessment and an informed consent process indicating the

nature of the differential diagnoses, relevant evaluation, and treatment alternatives and their prospective risks and benefits) to an algorithmic dependence on a specific set of guidelines.^{4,5}

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1 Litvan I, MacIntyre A, Goetz CG, *et al*. *Arch Neurol* 1998;55:969–78.

2 Nagy Z, Esiri MM, Hindley NJ, *et al*. *Dement Geriatr Cogn Disord* 1998;9:219–26.

3 Wetterling T, Kanitz RD, Borgis KJ. *Stroke* 1996; 27:30–6.

4 Practice parameter for diagnosis and evaluation of dementia (summary statement). *Neurology* 1994;44:2203–6.

5 Bursztajn HJ, Feinbloom RI, Hamm RM, *et al*. *Medical choices, medical chances: how patients, families, and physicians can cope with uncertainty*. New York: Routledge, 1990.