

Electronic supplementary material 3 – Diagnostic criteria

Article: Identifying dementia outcomes in UK Biobank: a validation study of primary care, hospital admissions and mortality data

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Appendix 3. Diagnostic criteria

1. Dementia – ICD-10 definition¹

A syndrome due to disease of the brain, usually of a chronic or progressive nature in which there is disturbance of multiple higher cortical functions, including memory, thinking, orientation, comprehension, calculation, learning capacity, language, and judgement. Consciousness is not clouded. The impairments of cognitive function are commonly accompanied, and occasionally preceded, by deterioration in emotional control, social behaviour, or motivation.

2. Alzheimer's disease – NIA-AA criteria for probable AD dementia²

Meets criteria for dementia and in addition:

- A. Insidious onset
- B. Clear-cut history of worsening cognition
- C. The initial and most prominent deficits are in one of the following categories:
 - i) Amnestic – impairment in learning and recall
 - ii) Non-amnestic – language, visuospatial or executive dysfunction
- D. Diagnosis of probable AD should not be applied if there is:
 - i) Substantial concomitant cerebrovascular disease
 - ii) Features of Dementia with Lewy bodies
 - iii) Prominent features of behavioural variant frontotemporal dementia
 - iv) Prominent features of primary progressive aphasia
 - v) Evidence of another cause that could have a substantial effect on cognition

3. Vascular dementia – NINDS-AIREN criteria³

Meets criteria for dementia and in addition:

- A. Evidence of cerebrovascular disease
 - i) Presence of focal signs on neurological examination
 - ii) Evidence of cerebrovascular disease on brain imaging as evidenced by any or all of:
 - a. Large vessel infarcts
 - b. Single strategically placed infarct
 - c. Multiple basal ganglia and white matter lacunes
 - d. Extensive periventricular white matter lesions
- B. A relationship between dementia and cerebrovascular disease as evidenced by one or more of:
 - i) Onset of dementia within three months following a stroke
 - ii) Abrupt deterioration in cognitive functions or stepwise progression of cognitive deficits

4. Dementia with Lewy Bodies – McKeith et al. (2005) criteria for probable DLB⁴

- A. Central features (essential for a diagnosis):
 - i) Dementia- progressive decline of sufficient magnitude to interfere with normal social or occupational function
 - ii) Prominent or persistent memory impairment may not necessarily occur in the early stages but is usually evident with progression
 - iii) Deficits on tests of attention, executive function and visuospatial ability may be especially prominent
- B. Core features (either two or more core features required or one core feature accompanied with at least one suggestive feature from C.):
 - i) Fluctuating cognition
 - ii) Recurrent visual hallucinations that are typically well formed and detailed
 - iii) Spontaneous features of parkinsonism
- C. Suggestive features
 - i) REM sleep behaviour disorder
 - ii) Severe neuroleptic sensitivity
 - iii) Low dopamine transporter uptake in basal ganglia demonstrated by SPECT or PET imaging
- D. Supportive features
 - i) Repeated falls and syncope
 - ii) Transient, unexplained loss of consciousness
 - iii) Severe autonomic dysfunction
 - iv) Hallucinations in other modalities
 - v) Systematised delusions
 - vi) Depression
 - vii) Relative preservation of medial temporal lobes on brain imaging
 - viii) Generalised low uptake on SPECT/PET perfusion scan with reduced occipital activity
 - ix) Abnormal (low uptake) MIBG myocardial scintigraphy
 - x) Prominent slow wave activity on EEG with temporal lobe transient sharp waves
- E. A diagnosis is less likely if:
 - i) Presence of cerebrovascular disease evident as focal neurological signs or on brain imaging
 - ii) Presence of any other physical illness or brain disorder sufficient to account for clinical picture
 - iii) If parkinsonism only appears for the first time at a stage of severe dementia
- F. Temporal sequence of symptoms:
 - DLB should only be diagnosed when dementia occurs before or concurrently with parkinsonism (if present)

5. Parkinson's disease dementia – Emre et al. 2007 for probable PD dementia⁵

A. Core features (both must be present)

- i) Diagnosis of Parkinson's disease
- ii) A dementia syndrome with insidious onset and slow progression as defined by
 - a. Impairment in more than one cognitive domain
 - b. A decline from premorbid level
 - c. Impairment in daily life, independent of the impairment ascribable to motor or autonomic symptoms

B. Associated clinical features

- i) Typical profile of cognitive deficits including impairment in at least two of four core cognitive domains (attention, executive function, memory and language)
- ii) Presence of at least one behavioural symptoms (apathy, depressed or anxious mood, hallucinations, delusions, excessive daytime sleepiness) supports the diagnosis, but lack of behavioural symptoms does not exclude the diagnosis

C. None of the following

- i) Co-existence of any other abnormality which may by itself cause cognitive impairment
- ii) Time interval between development of motor and cognitive symptoms not known
- iii) Cognitive and behavioural symptoms appearing solely in the context of other conditions such as acute confusion due to systemic disease, drug intoxication or major depression
- iv) Features compatible with vascular dementia according to NINDS-AIREN criteria

6. Frontotemporal dementia – FTDC criteria for behavioural variant FTD (bvFTD)⁶ and Mesulam criteria (2001) for primary progressive aphasia (PPA)⁷

FTDC criteria for possible bvFTD⁶

1. Evidence of a neurodegenerative disease
 - a. Progressive deterioration of behaviour and/or cognition
2. Three or more of the following
 - a. Early behavioural disinhibition
 - b. Early apathy or inertia
 - c. Early loss of sympathy or empathy
 - d. Early perseverative, stereotyped or compulsive/ritualistic behaviour
 - e. Hyperorality and dietary changes
 - f. Neuropsychological profile of executive/generation deficits with relative sparing of memory and visuospatial functions
3. Exclusion criteria (if (a) or (b) present then a diagnosis of bvFTD cannot be made. If (c) present then possible bvFTD can still be diagnosed but probably bvFTD cannot)
 - a. Pattern of deficits is better accounted for by other disorder
 - b. Behavioural disturbance is better accounted for by a psychiatric diagnosis
 - c. Biomarkers strongly indicative of Alzheimer's disease or other neurodegenerative process

Criteria for the diagnosis of PPA based on criteria by Mesulam 2001⁷

1. Most prominent clinical feature is difficulty with language
2. These deficits are the principal cause of impaired daily living activities
3. Aphasia should be the most prominent deficit at symptom onset and for the initial phases of the disease

Exclusion criteria

1. Pattern of deficits is better accounted for by other disorder
2. Cognitive disturbance is better accounted for by a psychiatric diagnosis
3. Prominent initial episodic memory, visual memory and visuoperceptual impairment
4. Prominent, initial behaviour disturbance

References

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