Evaluation of Cognitive Status and Dementia in OCTO Twin

Boo Johansson

The memory and cognitive battery encompassed the following questions and tests:

1. Orientation to own person (Full Name, Year of birth, Current age)
2. Self-ratings of memory and thinking (6 questions)
3. The Mini-Mental State Examination (MMSE; Folstein, et.al., 1975).
4. The Information Test (A Swedish version of the WAIS Information Task (Jonsson & Molander, 1964)
5. Figure Logic/Inductive Reasoning (SRB:2 from Dureman & Sälde, 1959)
6. Block Design - Koh’s Block Test (SRB 3 from Dureman & Sälde, 1959)
7. Verbal Meaning – Synonyms (SRB 1 from Dureman & Sälde, 1959)
8. Digit – Symbol (A modified version of the speeded Symbol-Digit Substitution Test from the Wechsler Adult Intelligence Scale, WAIS (Wechsler, 1991) where subjects were instructed to give a verbal response, instead of a written).
9. Digit – Span Forward and Backward (WAIS; Wechsler, 1991)
10. Perceptual Speed – Psif (from Dureman & Sälde, 1959)
11. Thurstone’s Picture Memory Test (Thurstone & Thurstone, 1949)
12. Prose Recall (A Swedish language prose recall task similar to the prose passages in the Wechsler Memory Test (WMS; Wechsler, 1945)
13. The MIR Test, including naming, free recall, recognition and correspondence tasks (Johansson, 1988/89)
14. The Swedish Clock Test (including the three subtests of: clock drawing, set the hands of a wooden clock with no numbers on the face to certain standard times, and set time to certain standard times (see, Johansson & Zarit, 1991)
15. The Coin Test (see, Johansson & Zarit, 1991)

Each test protocol was thoroughly reviewed and evaluated in the context of the persons overall health and physical functioning, including sensory functioning, motor handicaps, etc. Observations of test-taking behavior and everyday functioning during the in-person testing sessions were presented to Boo Johansson (BJ) who rated each individual on a 5-point scale. This rating of cognitive status (Cognitive Rating, CR) represents a composite score. The CR is used as a convenient way to summarize performance across the tests and to provide an overall evaluation of the persons overall memory and cognitive function.

1. **Intact - “normal” - memory and cognitive functioning**
   
   taking sensory and motor function, overall health, and physical functioning into account

2. **Mild dysfunction/Questionable impairment:**
   
   Evidence of mild impairment in memory and cognitive test performance. However, compromised memory and/or cognitive functioning not meeting criteria for dementia; DSM-III-R criteria (American Psychiatric Association, 1987).

3. **Mild impairment/dementia**
   
   Meeting criteria for mild dementia DSM-III-R criteria (American Psychiatric Association, 1987).

4. **Moderate impairment/dementia**
   

5. **Severe impairment/dementia**
   
   Meeting criteria for severe dementia DSM-III-R criteria (American Psychiatric Association, 1987).
Individuals rated as 3-5 (tentatively diagnosed as suspected or demented) were routinely given a diagnostic work-up, including a detailed interview with a key informant about memory and cognitive problems (onset, course and symptomatology), and a review of medical records. Findings were presented and discussed at a consensus diagnosis conference. Diagnoses were assigned following DSM-III-R criteria for dementia [18], NINCDS/ADRDA criteria for Alzheimer’s disease [19] and the NINDS-AIREN criteria for vascular dementia [20].

Additional information from medical records

Besides the in-person based evaluation medical records were reviewed in order to identify whether an individual might have received a dementia diagnosis. This routine was employed to ensure that individuals who declined participation at follow-ups were followed with respect to incidence of dementia.

OCTO Twin CODING:

The demtype variable is only based on in-person tested cases, found to be suspects of dementia and therefore taken through the consensus conference routine.

The totaldem variable is the sum of in-person evaluation and medical records (and information from the Harmony study).
Appendix – Protocols used in Consensus Conference

Criteria for dementia (DSM-III-R)

<table>
<thead>
<tr>
<th>CRITERION</th>
<th>Present/ Yes</th>
<th>Absent/ No</th>
<th>Uncertain</th>
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<tbody>
<tr>
<td>A.</td>
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<td>Demonstrable evidence of impairment in short- and long-term memory</td>
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<td>B.</td>
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<td>At least one of the following:</td>
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<td>1. Impairment in abstract thinking</td>
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<td>2. Impaired judgment</td>
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<td>3. Other disturbances of higher cortical function</td>
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<td>4. Personality change</td>
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<td>C.</td>
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<td>The disturbance in A and B significantly interferes with work or usual social activities or relationships with others</td>
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<td>Not occurring exclusively during the course of Delirium</td>
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<td>E.</td>
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<td>Either 1 or 2:</td>
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<td>1. There is evidence from the history, physical examination, or laboratory tests of a specific organic factor (or factors) judged to be etiologically related to the disturbance</td>
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Criteria for clinical diagnosis of Alzheimer’s Disease (NINCDS/ADRDA)

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<th>CRITERION</th>
<th>Present/ Yes</th>
<th>Absent/ No</th>
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<tr>
<td>PROBABLE ALZHEIMER’S</td>
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<td>I. Criteria</td>
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<td>1. Dementia established by clinical examination</td>
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<td>2. Deficits in two or more areas of cognition</td>
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<td>3. Progressive worsening of memory</td>
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<td>4. No disturbance of consciousness</td>
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<td>5. Absence of systemic diseases</td>
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<td>II. Supported by</td>
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<td>1. Progressive deterioration of specific cognitive functions</td>
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<td>2. Impaired activities</td>
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III. Consistent with
1. Plateaus in the course of progression of the illness
2. Associated symptoms
3. Other neurological abnormalities in some patients
4. Seizures in advanced disease
5. CT normal for age

IV. Unlikely features
1. Sudden, apoplectic onset
2. Focal neurologic findings
3. Seizures or gait disturbances

POSSIBLE ALZHEIMER’S

V. Criteria
1. Dementia syndrome
2. Presence of a second disorder is permitted
3. A single progressive deficit is sufficient

Alzheimer’s disease (according to NINCDS-ADRDA criteria)
1. Probable AD
2. Possible AD

Criteria for the diagnosis of vascular dementia
(NINDS-AIREN)

PROBABLE VASCULAR

1. Criteria
   1. Dementia
      (a) Impairment of memory
      (b) Impairment of two or more cognitive domains
      (c) Interfered with daily activities not due to physical effects of stroke alone
   2. Cerebrovascular disease
      (a) Focal signs on neurologic examination
      (b) Evidence of relevant CVD by brain imaging
3. A relationship between the above two disorders
   (a) Onset within 3 months of stroke
   (b) Abrupt deterioration or fluctuating, stepwise

II Consistent with
   1. Early presence of a gait disturbance
   2. History of unprovoked falls
   3. Urinary symptoms not explained by urologic disease
   4. Pseudobulbar palsy
   5. Personality and mood changes

III Unlikely features
   1. Absence of corresponding focal lesions on brain imaging
   2. Absence of focal neurologic signs
   3. Absence of cerebrovascular lesions on CT/MRI

POSSIBLE VASCULAR

VI. Permitted
   1. Absence of brain imaging
   2. Absence of clear temporal relationship between dementia and stroke
   3. Subtle onset and variable course and evidence of relevant CVD

Vascular disease (according to NINCDS-AIREN criteria)

1. Probable VaD
2. Possible VaD
Appendix: Coding of Consensus conference outcome (only in Swedish)

Evaluation - Diagnosis

Datum: .............................................. c20
År mån dag

Prel. demens enl. DSM-III-R-kriterier: kvarstår; ej work-up ( ) 0
bekräftas ( ) 1 avfärdas ( ) 2 avvaktas ( ) 3
pga .......................................................... c21

Ej demens/ ev. annan diagnos ( ) 9 (c22 type:main)

Demens? (290 Y). ............................................... ( ) 0

Demens NUD ................................................ ( ) 1

Primärdegenerativ demens ( ) 2 (c23 type 2)
* Alzheimer-typ
  - Alzheimer's; trolig (NINCDS/ADRDA) ( ) 21
  - Alzheimer's; möjlig (............"..........) ( ) 22
* Annan - ........................................................... ( ) 25 -

Vaskulär demens ( ) 3 (c24 type 3)
  - Vaskulär demens, trolig (NINDS-AIREN) ( ) 31
  - Vaskulär demens, möjlig (............"..........) ( ) 32
  - Multinfarkt demens (DSM-III-R) ( ) 33
  - Om 31/32 och 33 ( ) 35

Mixed demens, spec................................. ( ) 4

 Sekundär demens ( ) 8 (c25 type 8)
  - Hjärnskadebetingad demens(bild) kod 310 ( ) 81
  - Normaltryckshydrocefalus ( ) 82
  - Infektionsrelaterad, spec......................... ( ) 83
  - Övrigt, spec............................................. ( ) 84 -

Andra störningar/sjuksommar och tillstånd av betydelse för demens Nej ( ) 0 Ja ( ) 1 c30
* Depression (Major enl. DSM-III-R) ( ) c31
* Annan psykisk störning ( ) c32

* Signifikanta somatiska sjukdomar/tillstånd ( ) c33

Signifikanta livshändelser och liknande av betydelse för demens Nej ( ) 0 Ja ( ) 1 c34

*** Grad av säkerhet i diagnos : låg ( )---------( )-------( ) hög *** c40
References


