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Effect of diagnostic criteria on prevalence of frontotemporal dementia in the elderly

Thorsteinn B. Gislason[a,*], Svante Östling[a], Anne Börjesson-Hanson[a], Magnus Sjögren[a], Michela Simoni[b], Leonardo Pantoni[b], Ingmar Skoog[a]

[a]*Neuropsychiatric Epidemiology Unit, Department of Psychiatry and Neurochemistry, The Institute of Neuroscience and Physiology, Sahlgrenska Academy, University of Gothenburg, Mölndal, Sweden*

[b]*Department of Neurological and Psychiatric Sciences, University of Florence, Florence, Italy*

Abstract

Background: Frontotemporal dementia (FTD) is believed to be rare in the elderly, and the influence of different criteria on the prevalence of FTD is unclear.

Methods: Population-based samples of 70- to 95-year-olds (n = 2462) in Gothenburg, Sweden, underwent neuropsychiatric examinations. Behavioral variant FTD (bvFTD) was diagnosed according to the International Behavioural Variant FTD Criteria Consortium (FTDC), the Frontotemporal Lobe Degeneration Consensus criteria, and the Lund-Manchester Research Criteria. A subset (n = 1074) underwent computerized tomography (CT) of the brain.

Results: The prevalence of bvFTD varied between 0.2% and 0.5% at age 70 to 79 years, between 2.5% and 3.6% at age 80 to 89 years, and between 1.7% and 2.2% at age 90 to 95 years. The agreement between different criteria was low to moderate ($\kappa = 0.20–0.42$). Among those with bvFTD according to FTDC, 93.3% had frontal and/or temporal lobar atrophy on CT, compared with 12.6% of those without bvFTD ($P < .001$).

Conclusions: The prevalence of bvFTD was higher than expected in this population. To a large extent, different criteria captured different individuals.

Keywords: Frontotemporal dementia; Aged; Prevalence; Tomography; X-ray computed

1. Introduction

The diagnosis of frontotemporal dementia (FTD) continues to be challenging for clinicians and researchers [1]. Among the three subtypes of FTD, the most common is the behavioral variant FTD (bvFTD), whereas other subtypes (semantic dementia and primary progressive aphasia) are rare [1,2]. The core clinical manifestations of bvFTD are progressive deterioration of personal and social conduct and emotional and motivational blunting. Memory loss, apraxia, agnosia, and impaired spatial orientation most often occur late in the disease. Cases of bvFTD may thus not initially fulfill current criteria for dementia, in which memory impairment is mandatory [3,4]. Frontal lobe symptoms may also be caused by trauma and disorders such as Alzheimer's disease (AD), vascular dementia, frontal lobe tumors, and alcohol-associated dementia.

There are currently three clinical criteria sets for the diagnosis of bvFTD. The first criteria, Lund-Manchester Research Criteria (LMRC), were published in 1994 [5], followed in 1998 by the Consensus Criteria for Frontotemporal Lobar Degeneration (FTLD-CC) [6]. In 2011, the International Behavioural Variant FTD Criteria Consortium (FTDC) proposed revised criteria [1] as the 1998 criteria were considered to be too rigid for clinical and research purposes [7]. These three sets of diagnostic criteria include different combinations of impairments in social and emotional abilities.

The authors report no competing conflicts of interest as regards this study.

*Corresponding author. Tel.: +46-31-342-7002; Fax: +46-31-87-13-79.

E-mail address: thorsteinn.gislason@neuro.gu.se

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Few population studies have examined the frequency of FTD among the elderly. Most epidemiologic studies have been performed in the age group of 45 to 65 years [8], in which prevalence estimates range from 2.0 to 15.4 per 100,000 [9–13]. In individuals older than 65 years, most studies report that the prevalence is below 1% (using LMRC or FTLD-CC) [14–17]. An exception is a study from Italy reporting a prevalence of 5.2% in individuals older than 70 years [18]. However, this study was conducted in an isolated population with a high frequency of hereditary FTD. Furthermore, the studies among the elderly only included cases of FTD who also fulfilled criteria for global dementia, in which memory problems are mandatory. Thus, individuals with FTD who do not fulfill criteria for global dementia may remain undetected [19,20]. Furthermore, key informant interviews (with close relatives and caregivers) were used in only two of the studies among the elderly [14,17]. Key informant interviews are crucial to obtain retrospective information about early symptoms and course of symptoms as these are necessary to differentiate bvFTD from other dementia disorders. Using a combination of clinical examinations and key informant interviews, a prevalence of 3% for bvFTD according to the LMRC was reported in a representative population of 85-year-olds from Gothenburg, Sweden [21].

Thus, although it has been suggested that FTD may be more common than previously supposed [22–24], few studies have examined the prevalence of FTD in a wider range of ages among the elderly. Neither has the utility of different criteria been examined in elderly populations.

Our aims were to examine the prevalence of bvFTD in population samples of 70- to 95-year-olds from Gothenburg, Sweden, using three sets of criteria (the FTDC, FTLD-CC, and LMRC) and to determine the agreement between these criteria [1,5,6]. A further aim was to study the correlation between bvFTD and the occurrence of frontal and/or temporal lobe atrophy on computerized tomography (CT) of the brain.

2. Subjects and methods

2.1. Subjects

Between 1986 and 2001, studies on representative elderly populations in Gothenburg, Sweden, were conducted using identical examinations (including neuropsychiatric examinations and key informant interviews) at each occasion [25]. All samples were systematically obtained from the Swedish population register based on birth dates and included people living in private households and residential care. To examine the age-specific prevalence of bvFTD, we merged data from these studies.

2.1.1. The H70 study

In 2000 to 2001, an effective sample of 827 individuals aged 70 years was selected, and a total of 579 individuals (350 women and 229 men) agreed to participate (response rate, 70%) [26]. There were no differences between participants and nonparticipants regarding sex, marital status, or previous outpatient or inpatient psychiatric care. Nonparticipants had a higher 5-year mortality rate than participants among both women (9.0% vs. 2.3%, $P < .001$) and men (23.7% vs. 7.5%, $P < .001$), as described previously [26].

2.1.2. The H85 study

In 1986 to 1987, an effective sample of 783 individuals aged 85 years was selected, and a total of 494 individuals (351 women and 143 men) agreed to participate (response rate, 63%) [27]. There were no differences between participants and nonparticipants regarding sex, marital status, registration as psychiatric outpatients or inpatients, 3-year mortality rate, and institutionalization. Identical studies in this sample were conducted at ages 88 (n = 260), 90 (n = 200), and 92 years (n = 190) [27,28].

2.1.3. The 95+ study

In 1996 to 1998, an effective sample of 529 individuals aged 95 years was selected, and a total of 338 individuals (263 women and 75 men) agreed to participate (response rate, 64%). There were no significant differences between participants and nonparticipants regarding marital status and 3-year mortality rate [29].

2.1.4. The Prospective Population Study of Women

In 1992 to 1993, an effective sample of 837 women (aged 70, 74, 78, and 84 years) was selected, and a total of 559 women (response rate, 67%) agreed to take part (255 aged 70 years, 215 aged 74 years, 70 aged 78 years, and 19 aged 84 years) [30–33]. In 2000 to 2001, the number of women who were alive was 629, and 439 (response rate, 70%) agreed to participate in neuropsychiatric examinations (216 aged 78 years, 171 aged 82 years, 44 aged 86 years, and 8 aged 92 years).

The data from these studies were merged, and 630 individuals without key informant interviews were excluded, leaving 2462 (79.6%) for study (503 men and 1959 women). The merged sample was stratified by ages 70 to 79, 80 to 89, and 90 to 95 years (Table 1).

The Ethics Committee for Medical Research at Gothenburg University approved all studies. Informed consent was obtained from the participants, their nearest relatives, or both.

2.2. Methods

Identical neuropsychiatric examinations and key informant interviews were used for all participants included in this study. The neuropsychiatric examinations were semi-structured and performed by trained neuropsychiatrists, except in 2000 to 2001 when they were performed by experienced psychiatric nurses. The examinations included ratings of symptoms and signs common in dementia and a cognitive test battery [27]. Psychiatric symptoms and signs