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Referral Patterns for Syndromes Associated With Frontotemporal Lobar Degeneration

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Abstract

We compared demographics of subjects diagnosed with frontotemporal degeneration (FTD) at a group of 5 clinics specializing in this non-Alzheimer dementia against those subjects diagnosed at standard Alzheimer disease centers, to determine any differences in referral patterns between such clinics.

Of the two major phenotypes of FTD, behavior and language, the latter more frequently presented to the specialty clinics (46% of FTD diagnoses versus 19%, $P < 0.001$). Mean age at onset for the behavioral presentation phenotype was one year younger at the specialty clinics ($P < 0.01$). Mean age at onset for the language phenotype was 3 years older ($P < 0.001$) than for the behavioral phenotype at standard centers but did not differ between the two evaluating groups.

Cases with FTD referred to all of the dementia evaluation sites in this study did not differ significantly from those previously reported in the literature. Clinics specializing in FTD recruit more language presentation cases. There were statistical but not clinically significant differences in ages at onset.

Keywords

frontotemporal degeneration; gender; referral onset age

Frontotemporal degeneration (FTD) is a non-Alzheimer dementia that may rank as the second most common cause of early onset dementia.^{1,2} Both behavioral and language presentations³ of FTD usually have earlier onset (mean onset in sixth decade of life) than Alzheimer disease (AD) (mean onset in eighth decade of life). Patients with FTD may present for evaluation at a standard dementia evaluation center, where the diagnosis of AD predominates, or they may be referred more specifically to centers that offer programs subspecializing in FTD. We queried a large data set for differences in demographics between these two types of evaluating groups, hypothesizing that community education efforts by the

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FTD-specific centers would garner patients earlier in the course of illness, potentially patients with higher educational levels who might be more likely to seek a subspecialty clinic featuring a “local expert,” and a higher proportion of patients with behavioral than language presentations of FTD.³ Because the language presentation can resemble AD, these patients might therefore be more likely to present to a standard center.

METHODS

We collected data on subjects diagnosed with FTD by consensus criteria⁴ at the National Alzheimer’s Coordinating Center, the Medical Research Council Cognition and Brain Sciences Unit in Cambridge, and UCSF. All centers defined onset age as the earliest age at which the first symptoms were reported. Sites offering FTD-specific programs (FTDC) included: UCLA, UCSF, University of Texas-Southwestern, University of Southern California, and the Medical Research Council Cognition and Brain Sciences Unit in Cambridge. All other NACC Alzheimer’s disease centers constituted the standard group (ADC).

We used Pearson χ^2 tests to compare gender ratio and phenotype diagnosis between evaluating groups (FTDC versus ADC). We compared the ages at onset and educational levels by two-tailed t test assuming equal variance and subjected variances for the two groups to an F-test.

RESULTS

Table 1 shows the demographics and clinical diagnoses of our FTD sample of 1333 cases. The ADC group evaluated the majority (1151, 86%), and the FTDC group evaluated 182 (14%). Education levels and ages at onset were not available for all subjects. Age range for the entire clinically diagnosed sample was 17 to 91 years. χ^2 tests did not reveal a significant preponderance of men with FTD. Age at onset for language presentation was 3 years older than for behavioral presentation cases ($F = 17.1$, $P < 0.001$) within the standard ADC group only. Mean age at onset for women seen at the specialty clinics (60 years) was younger than for the other women (62 years, $F = 7$, $P < 0.001$). Men with FTLD had higher level of education than women in the overall sample (14.6 versus 13.4 years, $F = 35.8$, $P < 0.001$), but mean educational levels did not differ between genders between evaluating groups.

DISCUSSION

The only clinically significant difference between referral patterns for the evaluating groups may lie in the higher frequency of language presentation cases at the sites specializing in FTD. We had hypothesized that seeking subspecialty attention for FTD might indicate a group with higher motivation to seek management, but our results do not indicate clinically significant younger onset age or higher educational level among this group. If anything, there may be something about aphasia that drives this type of referral to the specialty clinics. Reasons for referral to each of the evaluating groups may extend beyond awareness of the etiology of the dementia prior to the appointment. Patients may be referred to the specialty clinics for a second opinion after evaluation at a standard center (ADC), which would reduce the apparent differences between the groups. Data on source of referral (self-referral versus physician referral), prior non-FTD diagnosis (misdiagnosis), and distance of the clinic from the patient’s home were unavailable for this data set, but this type of information would have enabled us to comment on whether patients presented to FTDCs by convenience or by design.

Although it includes a large number of subjects with FTD, this study does bear limitations. There is likely to be selection bias. The data collected for this study likely do not constitute a true population-based sample. The population seen by FTDC or ADC may still reflect a higher

prevalence of FTD than might be expected for community neurology or psychiatry clinics that do not specialize in dementia.

Mean ages at onset for each of our comparison groups were consistent with those found in other studies.^{2,5,6} Most other studies on FTD risk factors have not identified gender, but Ratnavalli et al recently reported a striking male preponderance of 14:3 in their dataset.² The data from Ratnavalli's study were included in this sample.

A population-based Zuid-Holland province study reported onset age for FTD and a 1:1 male-to-female ratio similar to our findings.⁷ Their cases were actively recruited from local neurologists, psychiatrists, or nursing home clinicians, so there are no data regarding patient selection or referral to clinics alternative to the authors' specialty FTD clinic.

Subjects from our large data set presented to both standard and specialty dementia care centers for evaluation of FTD. Women who were slightly younger at onset of FTD and patients with the language presentation were more likely to present to the specialty clinics, but our data indicated that all centers should be well versed in diagnosis and management of FTD.

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The centers contributing to the National Alzheimer's Coordinating Center are:

Arizona Alzheimer's Center; Johns Hopkins University; Stanford University; University of Michigan; Baylor College of Medicine; Massachusetts General Hospital; University of Alabama, Birmingham; University of Pennsylvania; Boston University; Mayo Clinic; University of Arkansas; University of Pittsburgh; Case Western Reserve University; Mount Sinai School of Medicine; University of California, Davis; University of Rochester; Columbia University; New York University; University of California, Irvine; University of Southern California; Duke University Medical Center; Northwestern University; University of California, Los Angeles; University of Texas-Southwestern; Emory University School of Medicine; Oregon Health & Science University; University of California, San Diego; University of Washington; Indiana University; Rush-Presbyterian-St. Luke's Medical Center; University of Kentucky; and Washington University.

References

1. Harvey, RJ. Epidemiology of presenile dementia. In: Hodges, JR., editor. Early-onset Dementia: a Multidisciplinary Approach. Oxford: Oxford University Press; 2001. p. 1-23.
2. Ratnavalli E, Brayne C, Dawson K, et al. The prevalence of frontotemporal dementia. *Neurology* 2002;58:1615–1621. [PubMed: 12058088]
3. McKhann GM, Albert MS, Grossman M, et al. Clinical and pathological diagnosis of frontotemporal dementia. *Arch Neurol* 2001;58:1803–1809. [PubMed: 11708987]
4. Neary D, Snowden JS, Gustafson L, et al. Frontotemporal lobar degeneration: a consensus on clinical diagnostic criteria. *Neurology* 1998;51:1546–1554. [PubMed: 9855500]
5. Lendon CL, Lynch T, Norton J, et al. Hereditary dysphasic disinhibition dementia. A frontotemporal dementia linked to 17q21-22. *Neurology* 1998;50:1546–1555. [PubMed: 9633693]
6. Stevens M, van Duijn CM, Kamphorst W, et al. Familial aggregation in frontotemporal dementia. *Neurology* 1998;50:1541–1545. [PubMed: 9633692]
7. Rosso SM, Donker KL, Joosse M, et al. Frontotemporal dementia in The Netherlands: patient characteristics and prevalence estimates from a population-based study. *Brain* 2003;126:2016–2022. [PubMed: 12876142]

Demographics of 1333 Cases of Clinically Diagnosed Frontotemporal Degeneration

TABLE 1

	Specialty Clinics (FTDC)	Standard NACC Clinics (ADC)	Total FTD Sample	Statistics
N (row %)	182 (14%)	1151 (86%)	1333	
Gender (% men per site grp)	97 (53%)	610 (53%)	707 (53%)	
Behavioral presentation (column %)	99 (54%)	932 (81%)	1031 (77%)	$\chi^2 = 63.3, P < .001$
Language presentation	83 (46%)	219 (19%)	302 (23%)	
All FTD (N = 1259)	60 (.7)	61 (.3)	60.7 (.3)	$F = 7.239, P < .007$
Behavioral presentation	59 (1)	60 (.4)	60 (.3)	$F = 4.3, P < .05$ between site groups
Language presentation	61 (1)	63 (.6)	63 (.5)	$F = .07$, NS between site groups
All FTD (N = 1303)	13.8 (.3)	14.1 (.1)	14 (.1)	$F = .319, P = .57$
Educational level (years, SEM)				