

Epidemiology of early-onset dementia: a review of the literature

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Abstract: Presenile Dementia or Early Onset Dementia (EOD) is a public health problem, it differs from Senile Dementia, and encloses a significant number of cases; nevertheless, it is still poorly understood and underdiagnosed. This study aims to review the prevalence and etiology of EOD, comparing EOD with Senile Dementia, as well as to show the main causes of EOD and their prevalence in population and non-population based studies. The computer-supported search used the following databases: Pubmed/Medline, ISI Web of Knowledge and Scielo. The search terms were alcohol-associated dementia, Alzheimer's disease, dementia, Creutzfeldt-jakob disease, dementia with lewy bodies, early onset dementia, frontotemporal lobar degeneration, Huntington's disease, mixed dementia, neurodegenerative disorders, Parkinson's disease dementia, presenile dementia, traumatic brain injury, vascular dementia. Only papers published in English and conducted from 1985 up to 2012 were preferentially reviewed. Neurodegenerative diseases are the most common etiologies seen in EOD. Among the general population, the prevalence of EOD was found to range between 0 to 700 per 100.000 habitants in groups of 25-64 years old, with an increasing incidence with age. The progression of EOD was found to range between 8.3 to 22.8 new cases per 100.000 in those aged under 65 years. Alzheimer's disease (AD) is the major etiology, followed by Vascular Dementia (VaD) and Frontotemporal Lobar Degeneration (FTLD). A larger number of epidemiological studies to elucidate how environmental issues contribute to EOD are necessary, thus, we can collaborate in the planning and prevention of services toward dementia patients.

Keywords: Alzheimer's disease, AD, Early Onset Dementia, EOD, Epidemiology, Frontotemporal Lobar Degeneration, FTLD, Neurodegenerative Disorders, Presenile Dementia, Vascular Dementia, VaD.

INTRODUCTION

Dementia is not only an elderly disease, as it can also affect young people. The term "Early-Onset Dementia" (EOD) or "Presenile Dementia" defines all dementia related conditions onset before 65 years of age [1, 2]. This definition is based on traditional and historical cut-off, but is just an artificial separation, despite the worldwide renowned use [3, 4].

EOD has devastating psychosocial consequences that affect people in their most productive years of life and that have family responsibilities. The number of people with

EOD is growing, the disease is becoming more recognized with a clinical significance and an important social problem [5-8].

EOD is a heterogeneous group of cognitive disorders, but poorly understood, as the main focus of dementia is based on older populations, so EOD is more underdiagnosed, misunderstood, and inadequately treated, with limited services and resources in many countries [9, 10]. It can be perceived as a fatal disorder in which there is no cure and death appears before old age [11]. Without knowing the prevalence of all causes of dementia, services tend to underestimate the need to medical attention, leaving unattended a large number of patients and their families [12].

The observed prevalence studies in several countries show significant proportions of patients with EOD, at least among the selected populations [3]. The prevalence of de-

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Table 1. Comparison of Percentages of the Etiology of EOD in Several Studies

Diagnoses	n	AD	VaD	FTLD	LBD	TBI	ARD	HD	PDD	NPH	CJD	HIV	MD
References													
[19]	200	54(27%)	33(17%)	7(4%)	4(2%)	NR	12(6%)	3(1.5%)	2(1%)	1(0.5%)	NR	NR	NR
[20]	132	59(45%)	16(12%)	9(7%)	NR	NR	19(14%)	NR	NR	NR	NR	NR	NR
[21]	185	62(34%)	34(18%)	23(12%)	12(7%)	EX	19(10%)	9(5%)	2(1%)	NR	NR	NR	NR
[28]	141	30(21%)	52(37%)	7(5%)	NR	13(9.2%)	NR	NR	NR	6(4.2%)	NR	NR	NR
[49]	76	10 (13%)	33(44%)	NR	NR	NR	NR	NR	NR	NR	NR	3(4%)	7(9.2%)
[13]	34	13(38.2%)	8(23.8%)	5(14.7%)	1(2.9%)	3(8.8%)	NR	NR	NR	NR	NR	NR	2(5.9%)
[4]	278	48(17%)	80(29%)	7(3%)	NR	67(24%)	15(5%)	4(1%)	NR	6(2%)	1(<1%)	22(8%)	NR
[22]	185	71(38.5%)	23(12.6%)	40(21.4%)	1(0.5%)	9(4.9%)	NR	NR	NR	NR	NR	NR	2(1%)
[29]	112	27(11.9%)	7(3.1%)	43(19%)	1(0.4%)	4(1.8%)	6(2.7%)	EX	3(1.3%)	NR	5(2.2%)	1(0.4%)	NR
[17]	235	4(1%)	14(5.9%)	31(13.19%)	NR	EX	1(<1%)	18(7.6%)	1(<1%)	4(1%)	NR	NR	NR
[23]	54	19(35.2%)	6(11.1%)	16(26.62%)	NR	NR	NR	9(16.6%)	NR	NR	NR	NR	NR
[18]	69	46(66.7%)	3(4.3%)	7(10.1%)	1(1.4%)	NR	NR	NR	NR	NR	NR	NR	NR
[26]	93	31(33%)	19(20%)	25(27%)	NR	NR	NR	4(4%)	4(4%)	NR	NR	NR	NR
[24]	114	31(27.2%)	7(6.1%)	28(24.6%)	3(2.6%)	NR	NR	3(2.6%)	2(1.8%)	NR	6(5.3%)	NR	NR
[27]	617	158(25.6%)	262(42.5%)	16(2.6%)	NR	NR	3(2.8%)	NR	NR	NR	NR	NR	NR
[25]	144	61(42.4%)	20(13.8%)	14(9.7%)	1(<1%)	2(1.3%)	5(3.4%)	3(2%)	3(2%)	NR	2(1.3%)	NR	9(6.3%)

Data are expressed as number of patients (percentage); AD=Alzheimer disease; VaD=Vascular Dementia; FTLD= Frontotemporal Lobar Degeneration; LBD=Lewy Body dementia; TBI:traumatic Brain Injury; PDD=Parkinson disease dementia; HIV= HIV-associated dementia; ARD= Alcohol- related dementia; HD= Huntington disease; NPH=Normal Pressure of hydrocephalus; MD=Mixed dementia; CJD= Creutzfeldt-jakob disease; NR=not reported. EX: Excluded, n= number of patients.

mentia in people under 65 years has been investigated, and it is observed from 35 years and also that the prevalence doubles every five years, such as in Senile Dementia [6].

OBJECTIVE

This study aims to review the prevalence and etiology of EOD, comparing EOD with Senile Dementia, as well as to show the main causes of EOD and their prevalence in population and non-population based studies.

METHODS

The computer-supported search used the following databases: Pubmed/Medline, ISI Web of Knowledge and Scielo. The search terms were alcohol-associated dementia, Alzheimer's disease, dementia, Creutzfeldt-jakob disease, dementia with lewy bodies, early onset dementia, frontotemporal lobar degeneration, Huntington's disease, mixed dementia, neurodegenerative disorders, Parkinson's disease dementia, presenile dementia, traumatic brain injury, vascular dementia. Only papers published in English and conducted from 1985 up to 2012 were preferentially reviewed. A manual search of additional references was performed in the references found in electronic databases. The inclusion criteria were studies about EOD containing its etiology and prevalence aspects with priority to epidemiological population and non-population studies. The exclusion criteria were articles

with inadequate methodology or that did not cover the issue of interest.

Based on the defined criteria, a total of 122 articles were found in the search conducted in the literature (65 in Pubmed and in 57 ISI Web of Science). These, 10 articles were duplicates and were therefore excluded, totalizing 112 articles. After the screening, 39 articles were excluded, which were not related to the proposed theme. The exclusion of the other articles was due to the following factors: 16 studies of pharmacological intervention, 13 studies of psychotherapy intervention and 10 studies of exercise intervention. Thus, 73 studies were selected which were properly met the criteria for this review.

ETIOLOGY OF EARLY-ONSET DEMENTIA

EOD is less common than dementia in later life. The differential diagnosis is broader and younger people are more likely to have a rare form of dementia. Many diseases and conditions have been identified as cause of EOD, such as AD, Vascular Dementia (VaD), Frontotemporal Lobar Degeneration (FTLD), Dementia with Lewy Bodies (DLB), Traumatic Brain Injury (TBI), Alcohol-associated Dementia (AAD), Huntington's disease (HD), Parkinson's disease Dementia (PDD), Mixed Dementia (MD) and Creutzfeldt-jakob disease (CJD) [4,8,13,14] and Down's syndrome (DS) [15]. Table 1 shows the etiology of early onset dementia in different studies.

The pattern of plain cognitive decline without other neurological features suggests primary neurodegenerative disorders like AD or FTLD. The presence of typical parkinsonism, for example, suggests PDD or DLB. The presence of white matter changes is particularly useful in evaluating for VaD. The differentiation among the main types of EOD should be based on clinical characteristics and combinations of psychiatric, psychometric, neurological, and neuropsychological methods [16].

Patients with EOD are more likely than those to have dementia other than AD. Besides that, AD has been described as the most common dementia diagnosis even among young adults. AD as the main etiology found, the prevalence rates of AD were found to range from 1% [17] up to 66.7% [18] (Table 1). Most of the studies showed AD as the most common etiology in EOD [13, 18-26].

Few studies showed an insignificant relationship of AD as prevalent etiology form among the EOD. Kelley *et al.* [17], in a cohort study, observed atypical etiological presentations, with a low percentage (1%) for AD, which could be explained by the inclusion of young adults aged between 17 and 45 years old, also because neurodegenerative etiology is uncommon before 29 years of age and exclusion of patients with TBI and acute cerebrovascular diseases. However, in general, the group of neurodegenerative diseases is still the leading cause for EOD, with 31.1% of the total, compared with metabolic, autoimmune, inflammatory, and infectious diseases.

AD is the main etiology for EOD followed by VaD or FTLD in Ferran *et al.* [19], Harvey *et al.* [21], Yokota *et al.* [13] and McMurtray *et al.* [4], Shinagawa *et al.* [22], Nandi *et al.* [26], Mercy *et al.* [23], Vilalta Franch *et al.* [18], Papa-georgiou *et al.* [24], Garre-Olmo *et al.* [25]. Besides, some authors [31-33] have postulated that presenile AD is characterized by an increased severity with fast cognitive impairment and shorter survival period compared to senile AD. However, another large-scale epidemiological research does not confirm this hypothesis [34].

EOD has a fast progression compared with Senile Dementia, with more extensive brain damage and complications [11]. Other studies have shown that such rapid progression also occurs in AD, in which the group of EOD has faster progression compared to the group of Senile Dementia [31, 35]. Nevertheless, characteristics of early-onset AD (EOAD) patients may not be generally applicable to all early-onset neurodegenerative diseases. The survival of patients with EOD between 45-65 years old was of 6.08 years old, and it seems not different from the LOD, as observed in Kay *et al.* [36].

One study [37] investigated the differences in pathology burden between EOAD and late-onset AD (LOAD) and suggested that LOAD has less cognitive reserve and requires less pathologic burden (synaptic loss and presence of neuritic plaques and neurofibrillary tangles) to manifest cognitive changes than EOAD. It may justify faster progression in EOAD.

Some peculiarities observed in EOAD compared with LOAD were mentioned by several authors: absence of confusional symptoms [38], more frequent parietal disturbances [39], more neuropathological changes with positive family

history [40], bilateral o myoclonus symptoms [41], more frequent impairment in attention skills [31], preferential involvement of tempoparietal lobes [42], more severe depletion of serotonin and noradrenaline [43], more pronounced loss of myelin sheath [44], greater fronto-parietal/ right hemisphere involvement [45], better verbal fluency and motor-executive functions [46], less delusion, hallucination, agitation, disinhibition and aberrant motor behavior [47]. The available evidence differences between EOAD and LOAD is still inconsistent and to some extent contradictory.

In Brazil, a single study in an outpatient clinic with 141 patients with EOD showed that VaD was the main cause [28]. In Japan, one study indicated VaD as the most common cause of EOD [27]. In India, another study [48] also showed VaD like the main cause with a prevalence of 44% among EOD, with multi-infarct state accounted for the majority. It is questionable whether these differences in frequencies are indeed geographical between eastern and western countries.

In a small number of studies FTLD was considered the main etiology [17, 29] among EOD. FTLD presents a prevalence percentage ranging from 3% to 26.6% [4, 13, 17-28]. In most studies, FTLD accounted for the second or third cause [17,22-27,29-30]. FTLD is comprised of three subgroups called frontotemporal dementia (FTD), semantic dementia (SD) and progressive non-fluent aphasia (PNFA). FTD is the most common clinical phenotype of FTLD. For instance, Shinagawa *et al.* [48] showed that early-onset FTD (EOFTD) presents apathy and deficits in memory and visuospatial functions.

DLB is rare among younger demented, particularly in comparison with late onset dementia [13, 18, 19, 21, 22, 24, 25, 29]. The prevalence among EOD ranged from less than 1% [25] to 7% [21].

TBI is also an important cause of EOD, it is a common neurological condition in young individuals [4, 25]. The prevalence of dementia by TBI ranged from 1.8% to 24% in EOD [4, 13, 22, 25, 28, 29] but was not considered the major cause in any study, obtaining a second/third place only in two studies [4,28]. In a study from McMurtray *et al.* [4] TBI appears with relatively high numbers (24%) based on the population of study, specifically the veteran and male patients. Males are more likely than female to have had significant head injuries. Within this context, there is a trend towards male predominance among EOD [4, 19, 21, 26, 28-30, 36, 49, 50]. In addition, Fujihara *et al.* [28] reported TBI as an important cause of non-degenerative dementias accounting 9.2% of the patients.

ARD showed frequency values between 1-14% [4, 17, 19-21, 25, 27, 29] and in the study by Williams *et al.* [20] ARD revealed a reasonable proportion between EOD, with a rate of 14%, occupying the third position among the EOD. Although not very frequent, alcoholic dementia seems to affect more young people than older people. In a study of elderly people in institutional care, those patients with ARD were found to be a mean of 10 years younger than subjects with other dementias [51].

HD showed prevalence ranging from 1-16.6% [4, 17, 19, 21, 23-25]. Mercy *et al.* [23] pointed out HD as the fourth cause of EOD with 16.6%. Moreover, the authors reported

Table 2. Prevalence of EOD in Overall Dementia

References	Year	Country	Number of Patients with Dementia	Age Considered of EOD	Prevalence of EOD
[30]	2002	Denmark	432	<60 years	47 (10.8%)
[12]	2002	Brazil	619	60-64years	177 (28.6%)
[28]	2004	Brazil	311	<65 years	141 (45.3%)
[13]	2005	Japan	464	<65 years	34 (7.3%)
[4]	2006	USA	948	<65 years	278 (29.3%)
[22]	2007	Japan	668	<65 years	185 (28%)
[29]	2007	Australia	254	<65 years	112 (44.0%)
[26]	2008	India	379	<65 years	63 (24.5%)
[18]	2008	Spain	670	<65 years	69 (10.3%)
[24]	2009	Greece	260	<65 years	114 (44%)
[25]	2010	Spain	2083	<65 years	144 (6.9%)

that this relative frequency of HD may be higher than cited for the reason that many patients at risk of HD do not go for testing, although would be under medical attention.

Neuropathological cases of PDD accounted for 1-4% of all cases of EOD [4, 17, 19, 21, 24, 25, 29]. PDD develops in people older than 70 years, and even Parkinson's disease is more common after 55 years of age, with a greater incidence after 60 years [52]. This explains the low relative frequency found in analyzed studies.

In MD there is an overlap between AD and cerebrovascular disease (CVD). Patients will have clinical features of both AD and VaD and can share risk factors and pathogenic mechanisms [53]. Diagnosis is complex due to the current lack of appropriate clinical criteria and terminology [54]. The prevalence of mixed dementia is much harder to measure as the concept is relatively new and most studies have used pathological evidence. The relative frequency of MD cases ranges from 1% to 9.2% and it showed to be uncommon in young people [13, 22, 25, 49, 55].

Creutzfeldt-jakob (CJD) disease is a prion disorder that can be sporadic, familial or iatrogenic [56]. Patients with CJD usually present with a rapidly progressive dementia, leading to a general decline in overall cognitive function and eventual death. CJD classically presents as a triad of dementia, myoclonus, and ataxia, and tends to affect much younger patients, typically young adults and teenagers, with an average age of 29 years [56]. Besides that, few numbers of studies reported CJD as etiology of EOD, with frequency relative ranges from 1% to 5.3% [4, 24, 25, 29].

DS shows EOD with compromised short-term memory, behavioral and anxiety disorders, deteriorating self care and social skills. The frequency of early dementia in Down's syndrome and vary from 6 to 75% in different studies [57,58]. The association has supposed to be based on the common pathogenic role of amyloid precursor protein in both Down syndrome and Alzheimer's disease [59]. The gene codifying for the precursor of the amyloid is localized in the chromosome 21 thus the increase expression of such a gene may be the causal factor of the association and the early

manifestation of like Alzheimer dementia in Down syndrome [60]. Carta *et al.* [15] hypothesized that the pro-inflammatory cytokine class plays a role in AD. They found higher levels of cytokines and chemokines in DS patients, however, significant difference was revealed only for MIP-1 alpha, i.e., a correlation between MIP-1 alpha and age was observed in DS patients.

The neurodegenerative disorders represent the most common cause of Presenile Dementia [61]. Among the neurodegenerative disorders the AD, VaD, and FTLD are the main causes of EOD, although not in all patients/people younger than 35 years [17]. VaD and FTLD are most common dementias, as EOD, than Senile Dementia, but few reports show that VaD or FTLD are the most frequent cause of EOD [4,17,27-29,49]. Although AD is the most frequent etiology of dementia, AD accounts for only about a third of all those patients with an early age onset, compared to about two-thirds (50-75%) of LOD [13,14,21].

PREVALENCE OF EARLY-ONSET DEMENTIA

Non-Population Studies

Investigations about the prevalence of EOD, in both demented patients in the suspicion of such, are commonly performed in hospitals, clinics, outpatient clinics, institutions or in a combination of all. The non-population studies are preferable to population-related ones, as they are more practical and cheaper.

In published hospital-based studies the relative frequency of EOD cases in demented people ranges from 6.9% [25] to 45.3% [28], and differences between studies are attributable to as selection bias due to the fact that populations and methods are not comparable. In Brazil, 141 (45.3%) patients out of 331 individuals with dementia were analyzed and diagnosed with EOD [28]. Another report, performed in Brazil, with a considerable number of patients (i.e., 619), showed a prevalence of 28.6% of EOD (177 patients with EOD) [12], the study considered only patients aged 60-64 years. Table 2 shows the prevalence of EOD in non-population studies.

Table 3. Prevalence of Age Groups in Dementia (for Each 100.000 Habitants) in Individuals Younger than 65 Years Old

Studies	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64
	Age Group (Years)							
[66]	-----45-----							351*
[65]	-	-	-	-	-	-	-	700
[64]	-----0-----				77	40	86	249
[63]	20	-	-	17	-	23	-	83
[20]	-----42-----							78
[21]	-----54-----							98.1
	-	12.7	8	15.5	33	62.5	152.1	166.3
[27]	-----42.3-----							

*age group 60-69.

Population Studies

Table 3 summarizes the main studies with rates of population prevalence shown with the number of cases per unit of population at risk (per 100.000). One report in Japan found prevalence of the 42.3 per 100.000 for an age group range from 20-64 years. This study also reported the prevalence of EOD of 83.3 per 100.000 for an age group 45-64 years whereas the prevalence for AD for age groups from 25-64 and from 45-64 years was 10.6 and 22.3 per 100.000 respectively [27].

Other studies have also investigated the prevalence in different age groups for EOD. For age group 25-29 years, the prevalence ranges from 4 [27] to 20 per 100.000 [62]. For a 30-34 years age group, the prevalence ranges from 4.2 to 13 per 100.000 [21, 27, 63]. For the age group from 35-39 years, the prevalence ranges from 4.9 to 8 per 100.000 [21, 27]. In the age group 40-44 years, the prevalence ranges from 11.9 to 17 per 100.000 [21, 27, 62]. Whereas for the age group 45-49 years, the prevalence ranges from 24.3 to 77 per 100.000 [21, 27, 63]. In contrast, for the age group 50-54 years, the prevalence ranges from 23 to 62.5 [21, 27, 62, 63]. In the age group 55-59 years, the prevalence ranges from 86 to 152 per 100.000 [21, 27, 63]. And finally, in the age group 60-64 years, the prevalence ranges from 83 to 700 per 10.000 [21, 27, 62-65].

For other age groups as 30-64 years, the prevalence rate of EOD ranges from 42 to 54 per 100.000 [20,21] and for 45-64 years, the prevalence rate ranges from 78 to 98.1 per 100.000 in all the analyzed studies [20,21,27]. In general we can observe that the prevalence increases with age [20,21,27,66]. Table 3 shows the prevalence of EOD in population studies.

INCIDENCE OF EARLY-ONSET DEMENTIA

The incidence of a disease needs to be known for etiological studies but is also important to those planning diagnostic services within the health service. Data on the incidence of EOD are scarce.

The incidence of EOAD has been poorly investigated. A nationwide epidemiologic study of EOAD was carried in

Israel, the average annual rate of EOAD was found to be 2.4 per 100.000 people [67]. The incidence of EOAD was also studied by Newens *et al.* [34] and in United Kingdom it was estimated to be 7.2 per 100.000 subjects in the 45-64 years age group. Another study in Scotland showed an incidence of 22.6 cases of probable AD per 100.000 people for the same age group [68]. Two other recent population-based studies on EOD, one from 2008 and the other from 2010 at the age range 45-64 years, showed an incidence rate of EOAD as 4.2 per 100.000 people [23] and 11.9 respectively [25].

The incidence of early-onset FTLD has been poorly studied since it is a rare condition. A study from Minnesota estimated the incidence of FTLD as 4.1 cases per 100.000 people (age range 45-69 years) [69]. Mercy *et al.* [23] observed the incidence of FTLD for the age 45-64 years was 3.5 cases and for the same age group Garre-Olmo *et al.* [25] observed 2.5 cases per 100.000 people. It is worth to mention that for all causes of early onset dementia there is still a need for studies of incidence. A study from Bickel *et al.* [69], in Germany, showed the incidence of 8.3 new cases of Pre-senile Dementia per year/100.000 for age group of 50-64 years old. Mercy *et al.* [23] estimated the incidence for EOD (45-64 years old) as 11.5 new cases per year per 100,000 individuals in Cambridgeshire-United Kingdom. A recent study [25] in Girona, Spain reported the incidence of EOD for the age 45-64 years to be 22.8 cases per 100.000 people.

SURVIVAL IN EARLY-ONSET DEMENTIA

The study of survival in this early onset group is informative because most younger patients are less likely to die from co-existent disease.

The age of onset of symptoms is crucial for defining the survival time. So, as older the individual gets the dementia, the survival time seems lower [66]. Estimates of survival average were reported by some researchers and are important for determining the prognosis and treatment planning of patients.

Kay *et al.* [36], investigated the survival rate in EOD (AD plus VaD) between people aged 45-64 years old. They

showed an average of 8.6 years survival for both men and women, among these 5.97 years for men and 6.22 years for women are the survival rates. For EOAD, the average survival was 9.6 years and for VaD was 6 years. Thomas *et al.* [70] estimated a survival average for EOAD and VaD of 8.57 years and 6.1 years, respectively.

Respiratory diseases were reported as the main causes of death in EOD [71]. In line with this, Newens *et al.* [71] found out that pneumonia (48%), followed by cardiovascular (16%) and CVD (11%) were immediate causes of death. However, Ueki *et al.* [72] reported that pneumonia (73%), malignancy (20%), and heart disease (7%) were the main causes of death in EOD.

CONCLUSION

Although cases of dementia are more prevalent in the elderly, it also affects younger people with absolute number of significant cases. Neurodegenerative diseases were the main causes of dementia in the presenile range, with predominance in a significant number of articles reviewed. AD was considered the main one, followed by VaD and FTL. Epidemiological findings about the prevalence of EOD are scarce and inconsistent. Among the general population, the prevalence of EOD was found to range between 0 to 700 per 100.000 habitants, when studying groups aged 25-64 years old, with an increasing incidence with age. The progression of EOD was found to range between 8.3 to 22.8 new cases per 100.000 in those aged under 65 years. A larger number of epidemiological studies to elucidate how environmental issues contribute to EOD are necessary, thus, we can collaborate in the planning and prevention of services toward dementia patients.

CONFLICT OF INTEREST

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ABBREVIATIONS

AD	=	Alzheimer's disease
ARD	=	Alcohol- related dementia.
CJD	=	Creutzfeldt-jakob
CVD	=	cerebrovascular disease
DLB	=	dementia with Lewy bodies
EOD	=	Early-Onset Dementia
EOAD	=	early-onset AD

EOFTD	=	early-onset FTD
FTD	=	frontotemporal dementia
FTLD	=	frontotemporal lobar degeneration
HD	=	Huntington's disease
LOD	=	late onset dementia
LOAD	=	late-onset AD
MD	=	mixed dementia
PDD	=	Parkinson disease dementia
PNFA	=	progressive non-fluent aphasia
SD	=	semantic dementia
TBI	=	traumatic brain injury
VaD	=	Vascular dementia

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