Chapter 11

Argyrophilic Grain Dementia

CQ 11-1

What is the frequency of argyrophilic grain disease (AGD)?

Answer

The frequency of AGD in older people is estimated to be approximately 5-9%, and this disease is by no means rare. AGD is also known to be associated at high frequencies with other degenerative diseases, especially with corticobasal degeneration (CBD). C

Comments and evidence

AGD is a degenerative disease characterized pathologically by argyrophilic granular structures in the brain. Argyrophilic grains were first reported by Braak and Braak [1] in 1987. Since argyrophilic grains were first found in autopsied brains from persons with dementia, the condition was called argyrophilic grain dementia (or dementia with grains). However, as argyrophilic grains were also present in persons without dementia, the disease is now generally called AGD. There are few studies on the frequency of AGD and its relationship with dementia. The frequency of AGD in older people is estimated to be approximately 5-9%, and is therefore by no means rare. AGD is known to be associated at high frequencies with other degenerative diseases including Alzheimer's disease and dementia with Lewy body [2, 3]. In particular, AGD coexists with progressive supranuclear palsy and corticobasal degeneration at frequencies of 19% and 41%, respectively.[4] Tatsumi et al. [5] reported that argyrophilic grains were observed in 100% of corticobasal degeneration cases.

References

1) Braak H, Braak E. Argyrophilic grains: characteristic pathology of cerebral cortex in cases of adult dementia without Alzheimer changes. Neurosci Lett. 1987; 76(1): 124-127.
2) Martinez.Lage P, Munoz DG. Prevalence and disease associations of argyrophilic grains of Braak. J Neuropathol Exp Neurol. 1997; 56(2): 157.164.
3) Iseki E, Togo T, Suzuki K, et al. Dementia with Lewy bodies from the perspective of tauopathy. Acta Neuropathol. 2003; 105(3): 265-270.
4) Togo T, Sahara N, Yen SH, et al. Argyrophilic grain disease is a sporadic 4-repeat tauopathy. J Neuropathol Exp Neurol. 2002; 61(6): 547-556.
5) Tatsumi S, Mimuro M, Iwasaki Y, et al. Argyrophilic grains are reliable disease-specific features of corticobasal degeneration. J Neuropathol Exp Neurol. 2014; 73(1): 30-38.

Search formula

PubMed search: June 19, 2015 (Friday), August 125, 2015 (Tuesday)

#1 ((argyrophilic grain disease* OR ("argyrophilic grain" AND ("Dementia" [Mesh] OR dementia OR "Cognition Disorders" [Mesh] OR cognition disorder*))) AND ("Morbidity" [Mesh] OR morbidity [TI] OR prevalence [TI])) OR (argyrophilic grain* AND ("Dementia/pathology" [Mesh] OR "Nerve Degeneration/pathology" [Mesh]) AND ("Morbidity" [Mesh] OR morbidity OR prevalence OR incidence)) OR ("Dementia/pathology" [Mesh] AND argyrophilic grain disease* [TI]) OR (argyrophilic grain* [TI] AND "Dementia/pathology" [Majr])

Ichushi search: June 19, 2015 (Friday)

#1 (Argyrophilic grain dementia/AL OR ((Dementia/TH OR Dementia/TI OR Cognitive impairment/TH OR Cognitive impairment/TI) AND (Argyrophilic grain/AL OR Argyrophilic cell/TH OR Argyrophilic cell/AL))) AND (prevalence OR incidence OR incidence OR(SH = Epidemiology) OR Epidemiology/TH)

CQ 11-2

How is a clinical diagnosis made for argyrophilic grain dementia?

Answer

The clinical features of argyrophilic grain dementia are as follows: (1) elderly onset; (2) although onset symptom is memory impairment, behavioral and psychological symptoms such as stubbornness, irritability, delusion, personality change, and violent behavior are observed; (3) progresses slowly; (4) cholinesterase inhibitors have limited effectiveness; (5) left-right asymmetrical atrophy of the anterior side of medial temporal lobe, mainly at the ambient gyrus, (6) degree of atrophy of parahippocampal gyrus measured by volumetry tends to increase proportional to the Mini Mental State Examination (MMSE) score; (7) functional imaging shows left-right asymmetrically decreased uptake at the medial temporal lobe, (8) for cerebral spinal fluid biomarkers, amyloid-β (Aβ)42, tau and phosphorylated tau are normal in most cases.

C

Comments and evidence

In a study of the pattern of progression of argyrophilic grains in serial autopsy brains from older persons, the progression of argyrophilic grains was classified into: stage 1; localization in the ambient gyrus only, stage 2; progression to the medial side of temporal lobe, and stage 3; progression to involve the frontobasal region and anterior cingulate gyrus. Among stage 3 cases, 71% had dementia, 21% had mild cognitive impairment, and 8% had some psychiatric symptoms. The stage of progression tended to increase with aging, suggesting that argyrophilic grains are aging-related changes [1, 2]. In another study, stage 3 cases were extracted, and the left-right differences of atrophy at the anterior side of medial temporal lobe on morphological images and those of functional decline on functional images were examined. Left-right asymmetry was observed in 90.8% of the cases by histopathological examination, in 42.6% by morphological CT and MR images, and in all cases by functional SPECT and PET images [3].

Clinical signs of patients with argyrophilic grain dementia confirmed at autopsy include not only memory impairment [4], but also irritability, stubbornness, and delusional jealousy [5]. In argyrophilic grain dementia cases, tau and phosphorylated tau levels in cerebrospinal fluid are mostly normal, with a few cases showing levels slightly above the cut-off; and Aβ42 level is also normal, with only a few cases showing low levels [6]. Based on the above findings, the clinical features of argyrophilic grain dementia are listed above in "Answer" section.

■ References

1) Saito Y, Nakahara K, Yamanouchi H, et al. Severe involvement of ambient gyrus in dementia with grains. J Neuropathol Exp Neurol. 2002; 61(9): 789-796.
2) Saito Y, Ruberu NN, Sawabe M, et al: Staging of argyrophilic grains: an age-associated tauopathy. J Neuropathol Exp Neurol. 2004; 63(9): 911-918.
3) Adachi T, Saito Y, Hatsuta H, et al. Neuropathological asymmetry in argyrophilic grain disease. J Neuropathol Exp Neurol. 2010; 69(7): 737-744.
4) Jicha GA, Petersen RC, Knopman DS, et al. Argyrophilic grain disease in demented subjects presenting initially with amnestic mild cognitive impairment. J Neuropathol Exp Neurol. 2006; 65(6): 602-609.
5) Togo T, Isojima D, Akatsu H, et al. Clinical features of argyrophilic grain disease: a retrospective survey of cases with neuropsychiatric symptoms. Am J Geriatr Psychiatry. 2005; 13(12): 1083-1091.
6) Adachi S, Sato Y, Nakajima K, et al. Diagnosis of argyrophilic grain dementia. Dementia Japan. 2014; 28(2): 182-188. (In Japanese)

■ Search formula

PubMed search: June 19, 2015 (Friday), August 125, 2015 (Tuesday)

#1 ((argyrophilic grain disease* AND ("Diagnosis" [Mesh] OR diagnosis [TI] OR diagnostic[TI])) OR ("argyrophilic grain" AND ("Dementia/diagnosis" [Mesh] OR (dementia AND (diagnosis OR diagnostic)) OR "Cognition Disorders/diagnosis" [Mesh] OR (cognition disorder* AND (diagnosis OR diagnostic))))) OR ("Dementia/diagnosis" [Majr] AND grain* [TI] AND argyrophilic grain*)

Ichushi search: June 19, 2015 (Friday)

#1 (argyrophilic grain dementia/AL OR ((Dementia/TH OR Dementia/TI OR Cognitive impairment/TH OR Cognitive impairment/TI) AND (Argyrophilic grain/AL OR Argyrophilic cell/TH OR Argyrophilic cell/AL))) AND ((SH = Diagnostic use, diagnosis, diagnostic imaging, X ray diagnosis, radionuclide diagnosis, ultrasound diagnosis)OR Diagnosis/TH OR Diagnosis/TI)

CQ 11-3

What kinds of treatments are available for argyrophilic grain dementia?

Recommendation

There are no specific therapies for argyrophilic grain dementia. In practice, argyrophilic grain dementia is treated according to the therapies used for Alzheimer's disease dementia. However, cholinesterase inhibitors for argyrophilic grain dementia cannot be expected to be as effective as for Alzheimer's disease dementia and dementia with Lewy body.

2D

Comments and evidence

There are no therapies specifically for argyrophilic grain dementia. Even if this disease is clinically suspected, treatments are given according to those used for Alzheimer's disease dementia. In this disease, loss of cholinergic neurons in the basal nucleus of Meynert is mild [1]. Therefore, cholinesterase inhibitors for this disease cannot be expected to be as effective as for Alzheimer's disease dementia and dementia with Lewy body.

■ References

1) Tolnay M, Schwietert M, Monsch AU, et al. Argyrophilic grain disease: distribution of grains in patients with and without dementia. Acta Neuropathol. 1997; 94(4): 353-358.

■ Search formula

#1 ((argyrophilic grain disease* AND (Therapy [Mesh] OR therapy [TI] OR therapeutic [TI] OR treatment [TI])) OR "argyrophilic grain" AND ("Dementia/therapy" [Mesh] OR(dementia AND (therapy OR therapeutic OR treatment)) OR "Cognition Disorders/therapy" [Mesh] OR ("cognition disorder*" AND (therapy OR therapeutic OR treatment)))) OR (argyrophilic grain* AND (therapy [Mesh] OR therapy [TI] OR therapeutic [TI] OR treatment [TI] OR "Dementia/therapy" [Mesh]))

Ichushi search: June 21, 2015 (Sunday)
#1 (Argyrophilic grain dementia/AL OR ((Dementia/TH OR Dementia/TI OR Cognitive impairment/TH OR Cognitive impairment/TI) AND (Argyrophilic grain/AL OR Argyrophilic cell/TH OR Argyrophilic cell/AL))) AND ((SH = Therapeutic use, treatment, drug treatment, surgical treatment, transplantation, dietary treatment, psychiatric treatment, radiologic treatment, nursing, rehabilitation, prevention) OR Treatment/TH OR Treatment/TI OR Therapy /TI)