OPTINEURIN IN NEURODEGENERATIVE DISEASES

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Introduction: Optineurin is a gene associated with normal tension glaucoma and primary open-angle glaucoma, one of the major causes of irreversible bilateral blindness. Recently, mutations in the gene encoding optineurin were found in patients with amyotrophic lateral sclerosis (ALS).

Aims: We tried to confirm our hypothesis that optineurin immunoreactivities are more widely distributed among other neurodegenerative diseases than previously reported.

Methods: We examined a total of 18 patients with neurodegenerative diseases, including three sporadic ALS cases, three sporadic ALS cases with dementia, one sporadic ALS case with basophilic inclusions, two Alzheimer disease (AD) cases, four Parkinson disease (PD) cases, two Creutzfeldt-Jakob disease (CJD) cases, two multiple system atrophy (MSA) cases, and one case of Pick disease, using the anti-optineurin and ubiquitin antibodies.

Results: Immunohistochemical analysis showed aggregation of optineurin in skein-like inclusions and round hyaline inclusions in the spinal cord of ALS. However, optineurin was found not only in ALS-associated pathological structures but also in ubiquitin-positive cortical intraneuronal inclusions in ALS with dementia, basophilic inclusions in the basophilic type of ALS, neurofibrillary tangles and dystrophic neurites of AD, Lewy bodies and Lewy neurites in PD, ballooned neurons in CJD, glial cytoplasmic inclusions in MSA, and Pick bodies in Pick disease. With respect to optineurin-positive basophilic inclusions, these structures showed variable immunoreactivities for ubiquitin; some structures were obviously ubiquitin-positive, while others were negative for the protein.

Conclusions: Optineurin appears to be a more general marker to ALS and is also a wide distributed protein in neurodegenerative conditions.