Psychiatric Patients with Anti-thyroid Antibodies Presenting Elevation of Serum and Cerebrospinal Fluid Anti-glutamate Receptor Antibodies

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Objectives: The present study aims to examine antibodies against the N-methyl-D-aspartate-type glutamate receptor (NMDAR) subunits, NR1 and NR2B, in psychiatric patients with anti-thyroid antibodies (PPATs) and in those without (non-PPATs).

Background: A high prevalence of psychiatric illnesses among people with anti-thyroid antibodies, independent of thyroid function, has been recognized recently, which implies that not only hormonal but also neuro-immunological abnormalities contribute to the relationship between psychiatric illnesses and anti-thyroid antibodies. We previously reported a high prevalence of anti-NMDAR antibodies among psychiatric patients with anti-thyroid antibodies (1). However, it remains unclear whether the presence of anti-thyroid antibodies influences anti-NMDAR antibodies among psychiatric patients.

Material and Methods: We recruited inpatients aged 20-60 years. Patients with neurological diseases, dementia, developmental disorders, tumors, or autoimmune diseases, except autoimmune thyroiditis, were excluded. Twenty-seven subjects, who were divided into two groups according to the presence of serum anti-thyroglobulin antibodies and anti-thyroid peroxidase antibodies, were ultimately enrolled: eighteen PPATs and nine non-PPATs. We collected the sera and CSF of PPATs and non-PPATs as well as the sera of eighteen healthy controls (HCs) who were age- and sex-matched with PPATs. We investigated serum and CSF anti-NR1 and anti-NR2B antibodies using ELISA.

Results and conclusion: No significant differences were observed in demographic data between PPATs and non-PPATs (Table 1). The optical densities of serum anti-NR1 antibodies were significantly higher in PPATs than in HCs (Figure 1, A). The optical densities of CSF anti-NR1 (Figure 1, C) and anti-NR2B (Figure 1, D) antibodies were significantly higher in PPATs than in non-PPATs. Our finding indicates that detecting anti-thyroid antibodies in psychiatric patients would be a clue to consider anti-NMDAR encephalitis or anti-NMDAR antibody-related psychiatric conditions. Further studies focusing on the relationship between PPATs and anti-NMDAR antibodies are needed.

Table 1. Demographic Data of PPATs and Non-PPATs			
	PPATs	Non-PPATs	P-value
Age	42.7±11.8	34.7±12.7	0.084
Male (%)	3/18 (16.7)	4/9 (44.4)	0.18
Duration of illness	12.6±10.1	6.9±6.7	0.12
GAF	24.9±12.8	27.9±8.9	0.23
Psychosis	13/18 (72.2%)	7/9 (77.8%)	1.00
Catatonic features	1/18 (5.6%)	2/9 (22.2%)	0.25
TSH (μIU/mL)	4.72±4.37	3.00±3.45	0.23
FT4 (ng/dL)	1.22±0.27	1.09±0.18	0.16
CRP (mg/dL)	0.68±1.51	0.13±0.17	0.38
EEG abnormalities	2/17 (11.8%)	2/9 (22.2%)	0.59
Continuous variables are expressed in mean±SD. Comparisons between PPATs and non-PPATs were performed using the Mann-Whitney U-test for continuous variables and Fisher’s exact test for categorical variables.

Figure 1. Comparison of Anti-NR1 and Anti-NR2 Antibodies.

Reference: 1. Chiba Y et al. Anti-glutamate receptor ε2 antibodies in psychiatric patients with anti-thyroid autoantibodies - A prevalence study in Japan. *Neurosci Lett.* 2013;534(1):217–22.