CLINICAL STUDY

Uses of Antithyroid Antibodies in Nonvascular Hemisensory Impairment

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ABSTRACT

Aim: To find out the uses and correlation of antithyroid antibodies in patients with hemisensory impairment. **Background:** In day-to-day clinical practice, we have difficulties in managing patients with hemisensory impairment, where the diagnostic tests are not supporting clinical localization. **Material and methods:** All patients, aged 18 years and above, who came to the Neurology Department between February 2018 and August 2019 with either right or left persistent hemisensory impairment with or without facial involvement, were included. After the clinical assessment, appropriate investigations (complete blood counts, urea, creatinine, electrolytes, thyroid-stimulating hormone [TSH], serum B12, antinuclear antibodies [ANA] profile, perinuclear antineutrophil cytoplasmic antibodies [pANCA], cytoplasmic antineutrophil cytoplasmic antibodies [cANCA], neurolaboratory tests, carotid vertebral arterial Doppler study, magnetic resonance imaging [MRI] brain with magnetic resonance angiogram [MRA]/MRI brain with contrast) were done to confirm the diagnosis or to treat accordingly. Patients with acute stroke, demyelination, hemiplegic migraine and transient ischemic attack (TIA) were excluded. Rest of them were advised to undergo serum antithyroid antibodies and psychiatric assessment. Patients with positive antithyroid antibodies were treated with prednisolone 1 mg/kg/day for 6 weeks and reviewed. Psychiatric follow-up was done in patients with negative antithyroid antibody reports. Uses and correlation of antithyroid antibodies were analyzed. **Results:** A total of 33 patients were studied. Among them, 28 (85%) were females, 5 (15%) males and the mean age of presentation was 41.6 years. Out of 33 patients, 27 (82%) had subjective feeling of subacute onset persistent tingling sensation or numbness or tightness or hypo-/hyperesthesia or uneasiness on either side of the body with or without face involvement. Rest of the 6 patients (18%), had numbness with feeling weak on one side with no demonstrable sensory motor deficit. Antithyroid antibodies (antithyroglobulin and antithyroid peroxidase antibodies) were positive in 21 (64%) patients with hemisensory impairment. In this study, 28 (85%) were in euthyroid, 3 patients (9%) in hypothyroid and 2 (6%) were in hyperthyroid groups. Antithyroid antibodies were positive in 61%, 66% and 100%, respectively in the thyroid groups. None of our study patient had psychiatric illness or brain lesions on MRI study. **Conclusion:** Autoimmune thyroiditis can present with new onset persistent hemisensory impairment in young adults, which is more common in females. Both antithyroid antibodies are clinically useful in the diagnosis and management of nonvascular hemisensory impairment. Hence, the strong clinical judgment not supported by the diagnostic tests might alert the physician to rule out autoimmune thyroiditis in neuroaxis.

Keywords: Antithyroid antibodies (antithyroglobulin and antithyroid peroxidase antibody), thyroid-stimulating hormone, antinuclear antibodies profile, antineutrophil cytoplasmic antibodies, transient ischemic attacks, neuroaxis

The significance of the neurologic examination in the diagnosis of diseases of the nervous system can never be overstated. Neurologic diagnosis is often considered difficult as most parts of the nervous system cannot be examined directly, and its complex organization and integrated functions are difficult to comprehend by means of a superficial observation[1]. In day-to-day practice, we have difficulties in managing patients with hemisensory impairment, where the diagnostic tests are not supporting clinical localization. Hence, this study will help in such cases for early diagnosis and better management.

The uniqueness of this study is a rare presentation of autoimmune thyroiditis as hemisensory impairment and uses of antithyroid antibodies in such cases are discussed.

MATERIAL AND METHODS

All patients, aged 18 years and above, who came to the Neurology Department between February 2018 and

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August 2019 with either right or left persistent hemisensory impairment with or without facial involvement, were included. After the clinical assessment, appropriate investigations (complete blood counts, urea, creatinine, electrolytes, thyroid-stimulating hormone [TSH], serum B12, antinuclear antibodies [ANA] profile, perinuclear antineutrophil cytoplasmic antibodies [pANCA], cytoplasmic antineutrophil cytoplasmic antibodies [cANCA], neurolaboratory tests, carotid vertebral arterial Doppler study, magnetic resonance imaging [MRI] brain with magnetic resonance angiogram [MRA]/MRI brain with contrast) were done to confirm the diagnosis or to treat accordingly. Patients with acute stroke, demyelination, hemiplegic migraine and transient ischemic attack (TIA) were excluded. Rest of them were advised to undergo serum antithyroid antibodies and psychiatric assessment. Patients with positive antithyroid antibodies were treated with prednisolone 1 mg/kg/day for 6 weeks and reviewed. Psychiatric follow-up was done in patients with negative antithyroid antibody reports. Uses and correlation of antithyroid antibodies were analyzed.

STATISTICAL METHODS

All categorical variables expressed as percentage. The continuous variables represented as mean ± SD. Data entry was done in MS-Excel spreadsheet. Data analyses performed using Statistical Package for the Social Sciences software (SPSS 16).

RESULTS

A total of 33 patients were studied. Among them, 28 (85%) were females, 5 (15%) males and the mean age of presentation was 41.6 years. Antithyroid antibodies (antithyroglobulin and antithyroid peroxidase antibodies) were positive in 21 patients with hemisensory impairment.

Age distribution and their antithyroid antibody positive status were as below (Fig. 1).

Out of 33 patients, 27 (82%) had subjective feeling of subacute onset persistent tingling sensation or numbness or tightness or hypo-/hyperesthesia or uneasiness on either side of the body with or without face involvement. Rest of 6 patients (18%), had numbness with feeling weak on one side with no demonstrable sensory motor deficit. None of our study patient had psychiatric illness or brain lesions on MRI (including diffusion-weighted images [DWI]).

In this study, 28 (85%) were in euthyroid, 3 (9%) in hypothyroid and 2 (6%) were in hyperthyroid groups.

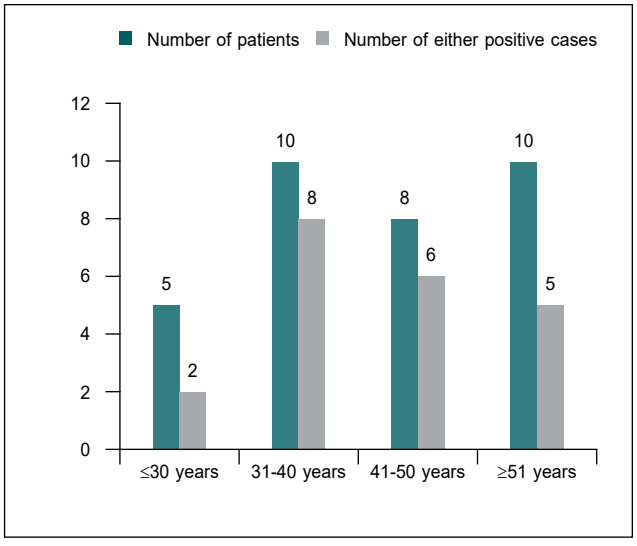

Figure 1. Age distribution of 33 patients.

Table 1. Thyroid Groups with Positive Antithyroid Antibodies

Thyroid Groups (Number of patients)	Number of antithyroid antibody positive cases (%)
Euthyroid 85% (28 patients)	17 (61)
Hypothyroid 9% (3 patients)	2 (66)
Hyperthyroid 6% (2 patients)	2 (100)
Total (33 patients)	**21 (64)**

Antithyroid antibodies were positive in 61%, 66%, and 100%, respectively in the thyroid groups (Table 1).

Irrespective of the TSH level, antithyroid antibodies were positive in all three thyroid groups.

DISCUSSION

Hashimoto's thyroiditis is the most common autoimmune thyroid disease. More than adequate or excessive iodine intake may lead to autoimmune thyroiditis[2-4] by generating reactive oxygen intermediates, by increase in immunogenicity and by increasing the lymphocytic infiltration of the thyroid[5]. Neurological manifestations of Hashimoto's thyroiditis include generalized/focal seizures, status epilepticus, myoclonus, stroke, hyperreflexia, tremors, encephalopathy and psychiatric manifestations such as psychosis, visual hallucination, paranoid delusion, mania, depression, dementia and catatonia[6,7].

In our study, 33 patients with hemisensory impairment, majority 28 (85%) were females and mean age of presentation was 41.6 years. Out of 33 patients, 27 (82%)

had subjective feeling of subacute onset persistent tingling sensation or numbness or tightness or hypo-/hyperesthesia or uneasiness on either side of the body with or without face involvement. Rest of the 6 patients (18%), had numbness with feeling weak on one side with no demonstrable sensory motor deficits. Basic neurology teaching is, deficits in a hemi-distribution suggest either the cortex, subcortex or thalamic lesion. Crossed deficits, affecting the face on one side and the body on the opposite side, suggest brainstem disease. But none of the 33 patients had brain lesions in MRI, including DWI.

Irrespective to their thyroid status, 21 patients with positive antithyroid antibodies had dramatic response to oral steroids. Mechanism of antithyroid antibodies causing sensory deficits is not known.

The formation of autoantibodies against the thyroid gland, cross-reacts with the N-terminal of endothelial α-enolase (NAE). This may cause autoimmune vasculitic infarct, the possible mechanism causing the vasculitic type of Hashimoto's encephalopathy, but none of our study patient had encephalopathy. This is a new observation in association of antithyroid antibodies with nonvascular hemisensory impairment. In future, we have a plan of doing positron emission tomography (PET) scan to know the metabolic abnormalities in patients with hemisensory impairment.

As per Toth et al, in a study on 34 patients with hemisensory syndrome, 6 patients (17.5%) had psychiatric illness[8]. However, no psychiatric illness was identified among the 33 patients in our study. Hence, autoimmune thyroiditis can present with persistent hemisensory impairment in neuroaxis. The strong clinical judgment not supported by the diagnostic tests might alert the physician to rule out autoimmune thyroiditis in neurology. In future, large samples including control groups will address the significance of this observational study.

CONCLUSION

Autoimmune thyroiditis can present with new onset persistent hemisensory impairment in young adults which is more common in females. Both antithyroid antibodies are clinically useful in the diagnosis and management of nonvascular hemisensory impairment. Hence, the strong clinical judgment not supported by the diagnostic tests might alert the physician to rule out autoimmune thyroiditis in the neuroaxis. In India, iodine supplementation should be targeted at iodine-deficient areas in order to reduce the prevalence of thyroid autoimmunity.

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