Case report

Steroid-responsive encephalopathy associated with autoimmune thyroiditis presenting as major depression

Lakshika Liyanage[1*], Charith Perera[1]

[1]Postgraduate Institute of Medicine, University of Colombo, Sri Lanka

Abstract

Steroid responsive encephalopathy associated with autoimmune thyroiditis (SREAT), is a rare condition that is often overlooked due to its variable clinical presentation with neuropsychiatric symptoms. However, presentation with exclusive psychiatric symptoms is rare.

Here we describe a case of 53-year-old female who presented with major depression and later developed overt hyperthyroidism with positive anti-Thyroid Peroxidase and anti -Thyroglobulin antibodies. With clinical suspicion of SREAT, she was started on steroid therapy which resulted in a remarkable recovery.

It is important to be aware of this possible association between depression and SREAT since in the majority, accurate diagnosis and treatment can produce an excellent outcome.

Keywords Steroid-responsive encephalopathy associated with autoimmune thyroiditis (SREAT), major depression, steroid, hyperthyroidism, Hashimoto encephalitis

Funding: None

Competing interest: None

Received: 24.09.2022 **Accepted revised version:** 28.11.2022 **Published:**30.04.2023

*✉**Correspondence:** lakshikachathu1991@gmail.com https://orcid.org/0009-0003-5373-8738

Cite this article as: Liyanage L *et al*, Steroid responsive encephalopathy associated with autoimmune thyroiditis presenting as major depression. Anuradhapura Medical Journal 2023; 17 (1): 78-81, DOI: http://doi.org/10.4038/amj.v17i1.7743

Introduction

Steroid-responsive encephalopathy associated with autoimmune thyroiditis (SREAT), is a rare condition that is often overlooked due to its variable clinical presentation and lack of definitive diagnostic criteria.

SREAT is characterized by the presence of neuropsychiatric manifestations and thyroid autoantibodies with the exclusion of other potential etiologies [1]. Its estimated prevalence is 2.1 per 100,000 [2] and mean age of symptom onset is 51 years (range of 9 to 86); females are affected more than males with a ratio of four to one [2]. Current hypotheses are in favor of autoimmune pathogenesis [3].

Identified clinical manifestations are focal neurologic deficits, seizures, cognitive dysfunction with altered conscious level [4] psychosis, mania and depression. Holanda et al. report cognitive impairment as the commonest symptom (65%) of SREAT while depression as the sole symptom only in 7% of patients [5]. Presentation with exclusive psychiatric symptoms is rare [6].

SREAT is independent of thyroid status as the patient can be euthyroid (42%), hypothyroid (25%) or hyperthyroid (19%) at presentation [5].

Here we present a case of a 53-year-old female patient who presented with a major depressive episode along with overt thyrotoxicosis and was managed as SREAT. She had a remarkable recovery with steroid therapy.

Case Summary

A 53-year-old previously healthy female presented with low mood, lack of interest in daily activities, feeling worthless, reduced ability to concentrate and low energy for 6 months duration without a significant precipitating social stress. She did not have psychotic symptoms. It was diagnosed as a major depressive disorder according to the DSM-IV criteria. She was started on sertraline 50mg daily and optimized to which she did not show any clinical response. Later she developed anxiety, heat intolerance, bilateral hand tremors, intermittent watery diarrhea, and weight loss despite a normal appetite. She was found to be thyrotoxic and was started on carbimazole and propranolol. She became euthyroid but despite good compliance, her depressive symptoms and cognitive impairment progressively deteriorated and she developed a reduced level of consciousness.

History did not reveal any features suggesting infection, focal neurological deficits, seizures, connective tissue or rheumatic diseases, malignancy, substance abuse or drug overdose.

At presentation, she was drowsy, without focal neurological deficits. Diffusely enlarged non-tender goitre was present. Examination of cardiovascular, respiratory, abdomen, musculoskeletal systems and breast examination was normal.

Table 1*:* Summary of investigations

Investigation	Results	Investigation	Result
Full Blood Count		CSF	
White cell count	6.08×10^9 /L	*protein*	46 g/dL
Neutrophil	4.02×10^9 /L	*ADA*	7 U/L
Lymphocytes	1.88×10^9 /L	*Sugar*	93 mg/dL
Eosinophil	0.1×10^9 /L	*Polymorph*	nil
Haemoglobin	12.4 g/dL	*Lymphocytes*	03
Platelets	201×10^9 /L	*Red cells*	18
C-reactive protein	5 mg/dL	*TB PCR*	Negative
Erythrocyte Sedimentation Rate	35 mm/1st hour	*Pyogenic culture*	No growth
Serum procalcitonin	0.01ng/mL	Blood culture	No growth
Urine Full Report	Normal	Mantoux	Negative
Urine culture	No growth	Thyroid profile	
Aspartate aminotransferase	198 IU/L	*TSH*	<0.0025 mIU/l
Alanine transaminase	243 IU/L	*fT4*	7 mcg/dL
Total Bilirubin	1.8mg/dL	*fT3*	10pmol/l
Alkaline Phosphatase	100IU/L	*Anti-thyroid peroxidase ab*	824 IU/ml
Gamma Glutamyl Transferase	55IU/L	*Anti-thyroglobulin ab*	1237 IU/ml
T. protein	46 g/dL	ANA	1/100 Nucleolar pattern
Albumin	25.3 g/dL	DS- DNA	Negative
S. creatinine	0.74 mg/dL	ENA panel	Negative
Blood urea	10 mg/dL	S.NMDA receptor Ab	Negative
S. Sodium	145 mmol/L	9 am cortisol	228 nmol/L
S. potassium	3.6 mmol/L	FBS	85 mg/dL
Calcium	9.32 mg/dL	Lipid profile	Normal
Mg	1.3 mg/dL	ECG	Normal
Creatine phosphokinase	12 mcg/L	Chest X ray	Normal
Neuron specific enolase	7.84ng/ml	USS Abdomen	Normal

An ultrasound scan neck showed diffusely enlarged thyroid gland with features suggestive of thyroiditis.

Electroencephalography (EEG) revealed background slowing. Magnetic resonance imaging (MRI) brain was normal.

She was given pulse IV methylprednisolone 500mg for 5 days followed by oral prednisolone 1mg/kg along with the continuation of propranolol and carbimazole. Sertraline was stopped. At the end of steroid pulses, patient's conscious level and depressive symptoms improved drastically. By the second month of therapy, her health was restored to near normal except for minimal cognitive impairment. With the clinical improvement prednisone was slowly taper off with close observation for relapse.

Discussion

Our patient initially presented with major depressive episode which did not respond to conventional antidepressant therapy. Later in the disease course, she developed overt hyperthyroidism which gave rise to the dilemma of whether this is co-existing depression, depression as a symptom of hyperthyroidism, autoimmune encephalitis or an atypical presentation of SREAT.

Hyperthyroidism is frequently associated with anxiety, irritability and mania [7]. Depression is commonly associated with hypothyroidism. In a study conducted at Nepal, the observed prevalence of overt hyperthyroidism in patients with depression was 4.3% while the majority had overt or subclinical hypothyroidism [8]. However, she poorly responded to the conventional treatment of depression or antithyroid therapy making the possibility of co-existing depression or depression as a symptom of thyroid illness unlikely.

The presence of high Anti-TPO antibodies, positive ANA and most importantly drastic improvement with steroids supported the diagnosis of SREAT, making this an unusual case of SREAT presenting as major depression.

Excluding autoimmune or paraneoplastic encephalitis was a challenge. Serum NMDAR and malignancy screening were negative but due to limited resources, we were unable to perform a complete autoantibody panel. EEG showed background slowing with negative MRI further supporting the diagnosis of SRAET in this clinical context.

Liver derangement can be seen in thyroid diseases. A meta-analysis by Scappaticco et al, [9] reported deranged liver functions are present in 55-60% of patients with untreated hyperthyroidism. However, our patient developed elevated liver transaminases during the euthyroid period and evaluation directed towards autoimmune hepatitis was negative. In 2003 P. Castillo et al. described a similar observation of high serum transaminases in a case series of SREAT patients [4] emphasizing the need for further study for this observation.

Treatment with steroids in SREAT renders complete remission in the majority of patients. Commonly used regime is IV methylprednisolone for 3-5 days followed by initial high dose oral prednisolone and a taper with clinical improvement [5]. Relapses can occur while tapering off prednisolone [10] or even following an asymptomatic period. Steroid-sparing agents such as Azathioprine, IV immunoglobulin and plasmapheresis [10] are attempted in difficult cases or relapses.

Currently, our patient is in near normal health with mild cognitive impairment. We are following her up for any clinical deterioration as well as for side effects of steroids, especially considering the high risk of developing osteoporosis in her postmenopausal state.

Conclusion

SREAT is a rare clinical condition with variable clinical manifestations including exclusive psychiatric manifestations such as psychosis and depression. It is important to be aware of this possible association between depression and SREAT. In an appropriate clinical context with or without active thyroid disease, antithyroid antibodies should be checked as accurate diagnosis and treatment can achieve remarkable recovery.

Article information

Conflict of interest: None

Funding: None

Ethical approval: Not required

Consent: Informed written consent was obtained from the patient

References

1. Siegmann EM, Müller HHO, Luecke C, Philipsen A, Kornhuber J, Grömer TW. Association of depression and anxiety disorders with autoimmune thyroiditis: a systematic review and meta-analysis. JAMA Psychiatry. 2018;75(6):577-584. doi: 10.1001/jamapsychiatry.2018.0190.

2. Ferracci F, Bertiato G, Moretto G. Hashimoto's encephalopathy: epidemiologic data and pathogenetic considerations. J Neurol Sci. 2004;217(2):165-8. doi: 10.1016/j.jns.2003.09.007.

3. Mocellin R, Walterfang M, Velakoulis D. Hashimoto's encephalopathy : epidemiology, pathogenesis and management. CNS Drugs. 2007;21(10):799-811. doi: 10.2165/00023210-200721100-00002.

4. Castillo P, Woodruff B, Caselli R, Vernino S, Lucchinetti C, Swanson J, Noseworthy J, Aksamit A, Carter J, Sirven J, Hunder G, Fatourechi V, Mokri B, Drubach D, Pittock S, Lennon V, Boeve B. Steroid-responsive encephalopathy associated with autoimmune thyroiditis. Arch Neurol. 2006;63(2):197-202. doi: 10.1001/archneur.63.2.197.

5. de Holanda NC, de Lima DD, Cavalcanti TB, Lucena CS, Bandeira F. Hashimoto's encephalopathy: systematic review of the literature and an additional case. J Neuropsychiatry Clin Neurosci. 2011;23(4):384-90. doi: 10.1176/jnp.23.4.jnp384.

6. Arrojo M, Perez-Rodriguez MM, Mota M, Moreira R, Azevedo A, Oliveira A, Abreu P, Marques P, Silva A, Pereira JG, Palha AP, Baca-Garcia E. Psychiatric presentation of Hashimoto's encephalopathy. Psychosom Med. 2007;69(2):200-1. doi: 10.1097/PSY.0b013e31803174c0.

7. Marian G, Nica EA, Ionescu BE, Ghinea D. Hyperthyroidism-cause of depression and psychosis: a case report. J Med Life. 2009;2(4):440-2.

8. Ojha SP, Dhungana S, Chapagain M, Tulachan P. Association of thyroid dysfunction with depression in a teaching hospital. J Nepal Health Res Counc. 2013;11(23):30-4.

9. Scappaticcio L, Longo M, Maiorino MI, Pernice V, Caruso P, Esposito K, Bellastella G. Abnormal liver blood tests in patients with hyperthyroidism: systematic review and meta-analysis. Thyroid. 2021;31(6):884-94. doi: 10.1089/thy.2020.0715.

10. Tamagno G, Celik Y, Simó R, Dihné M, Kimura K, Gelosa G, Lee BI, Hommet C, Murialdo G. Encephalopathy associated with autoimmune thyroid disease in patients with Graves' disease: clinical manifestations, follow-up, and outcomes. BMC Neurol. 2010;10:27. doi: 10.1186/1471-2377-10-27.