

Association of paediatric OCD with anti-thyroid antibodies and Hypovitaminosis D3 – A case report

Anand .B^{1,*}, Ravikanth .T², Anusha .K³, Preeti .G⁴

Dept. of Psychiatry, ¹⁻³Malla Reddy Institute of Medical Sciences, Hyderabad, Telangana, ⁴Chalameda Ananda Rao Institute of Medical Sciences, Karimnagar, Telangana, India

***Corresponding Author: Anand .B**

Email: anand6121957@gmail.com

Abstract

Hashimoto's thyroiditis (HT), can present with depression, anxiety, mania, acute psychosis, dementia, loss of cognitive function and other symptoms. Case reports with obsessions and compulsions in patients with Hashimoto's thyroiditis are few.¹ We present a case report of paediatric OCD with Hashimoto's thyroiditis and Hypovitaminosis D3 in a 13 year old girl who was brought with complaints of fear of contamination and washing rituals for last 2 years. Tetany and Hypothyroidism was diagnosed 3 months prior to the onset of illness. Investigations revealed, low Vitamin D levels, Anti TPO antibodies and Anti Thyroglobulin antibodies (ATG) positive and normal anti streptolysin (ASO) titre. Till date no case of OCD was reported with comorbid autoimmune thyroid disorder and Vitamin D deficiency. This case highlights the need to investigate for Hypothyroidism with OCD not just to rule out Pediatric autoimmune neuropsychiatric disorders (PANDAS) but also to diagnose Hashimoto's Thyroiditis. Vitamin D deficiency is common in patients with HT and its screening and supplementation must be considered in all patients.

Keywords: Paediatric OCD, Hashimoto's thyroiditis, Hypovitaminosis D.

Introduction

Autoimmune thyroid disorders (AITD) are most common type of autoimmune disorders. The prevalence of autoimmune thyroid disease ranges from 4 to 25% and is higher in women.² AITDs broadly include Graves' disease (GD) and Hashimoto's thyroiditis (HT) which is the most common causes of thyroid gland dysfunctions and nonendemic goitre. Production of antibodies to thyroid specific auto antigen i.e. thyroglobulin (TG), thyroperoxidase (TPO) and thyrotropin receptor (TSH-R) are the almost invariable feature of AITD.³ Elevated TSH with TPO antibodies is the gold standard for diagnosis of chronic HT.⁴ Various psychiatric syndromes have been associated with Hashimoto's thyroiditis, including depression, anxiety, mania, acute psychosis, dementia, loss of cognitive function.^{1,5-8} Most of these recover after treatment of Hashimoto's thyroiditis. There are few case reports published with obsessions and compulsions as a part of clinical picture in patients with Hashimoto's thyroiditis.⁹ In recent literature, potential role of 1,25-Dihydroxyvitamin D in development of HT and/or its progression to hypothyroidism is increasingly reported.¹⁰ In this case report, we present a case of paediatric OCD with Hashimoto's thyroiditis and Hypovitaminosis D3.

Case Presentation

A 13 year old female studying 8th grade, from middle class socio economic status was brought to psychiatric out patient department with complaints of repetitive, elaborate cleaning and washing rituals for last 2 years. Her specific feared consequences were about the bacterial infections from mud, dust, sticky substances that might enter her body through hands, nose or mouth and make her sick. Rituals included elaborate hand washing routines, prolonged and stereotyped showers which would take few hours at a stretch, with lengthy wiping and cleaning rituals after using the toilet,

disposing the towels or napkins for washing often used only once. She would avoid slimy and sticky vegetables like ladies finger, preferred use of crayons over water colours for painting and would wash hands with plain water instead of soap for fear of contamination even from soap. She would make frequent requests in the classroom to use toilet which disrupted her academic performance. Distress was high when she had to leave an outdoor play activity in the middle to perform washing rituals with embarrassment. The rituals at home would consume several hours a day and being late or frequently absent to school. There was no history of fever prior to onset of symptoms or repeated involuntary movements of face/vocal utterances. Biological functions were unaffected.

She consulted a paediatrician for weight gain and excessive sweating for past 3 years and 3 episodes of sudden muscle cramps in right hand, precipitated by prolonged writing. Investigations done then showed thyroid-stimulating hormone (TSH) levels of 9.71 mIU/L (reference range: 0.51–4.94), free thyroxine (FT4) 7.0 mcg/dL (reference range: 7.3–15), and triiodothyronine (T3) 184.30 ng/mL (reference range: 60–180), with low Vitamin D3 level of 5.29 ng/mL (reference range: deficiency is <20 ng/mL), normal Vitamin B12 =245pg/mL (reference range: 211-911pg/mL) and normal blood sugar. She was diagnosed with tetany and Hypothyroidism and treated with Vitamin D3 (Cholecalciferol 60,000 IU/week for 6 weeks) and Levothyroxine (50 mcg/day) supplementation on continuous basis. 2 months later thyroid profile improved to normal range.

On examination, the child appeared active, rapport easily established, weight 48kg, height 140cm and BMI 24.48. She had dark pigmented patches across neck on anterior aspect, suggestive of acanthosis, hyper pigmentation over fingers, sweating over both palms. No apparent thyroid swelling or

myxedema was seen. Vitals were stable and systemic examination was unremarkable. Her speech was normal. She had obsessive preoccupation with fears of contamination and associated distress. Depressed mood with reactive affect was observed but no ideas of worthlessness, hopelessness or suicide. No delusions or perceptual abnormalities, judgement was intact and insight present.

Diagnosis of OCD was made using DSM-5 criteria. On Children Yale-Brown Obsessive-Compulsive Scale (CYBOCS), obsession score 8, compulsions score 13 and the total score was 26.

On admission, EKG, liver function tests, electrolytes, and whole blood count were done which were within normal limits.

In view of her presentation with OCD along with hypothyroidism, vitamin D deficiency, tetany and hyper pigmentation, autoimmune aetiology was suspected and investigations were done. Anti microsomal antibody (AMA) or Anti TPO antibody 137 IU/mL (positive >34 IU/mL), Anti Thyroglobulin antibodies (ATG) 315.3 IU/mL (positive >115 IU/mL). ASO titre 20 IU/mL (negative <200 IU/mL), intact parathyroid hormone (PTH) 8.8pg/mL (reference 9-52 pg/mL), serum Calcium 9.89 mg/dL (reference range 8.8-10.6 mg/dL), serum Phosphorous 5.2 mg/dL (reference range: 4.0-7.0mg/dL).

The child was started on tablet fluoxetine 10mg/day later increased to 20mg/day over the next two weeks and exposure response prevention therapy (ERP) over 8 sessions. She was also on levothyroxine and vitamin D-calcium supplementation on Endocrinologist's advice. Follow-up at 4 months showed decline in C-YBOCS, obsession score 4, compulsions score 6, total score 10. She stopped taking fluoxetine due to nausea few days after the dose was increased to 20mg per day, however continued ERP.

Discussion

This case is being reported for a unique presentation of paediatric OCD with comorbid Hashimoto's thyroiditis, and Hypovitaminosis D and highlights the need for evaluating Vitamin D levels.

Autoimmune thyroid disorders may be linked to psychiatric disorders like depression and various anxiety disorders¹ reported association between autoimmune thyroid disease and unipolar depression, with significantly higher thyroid binding inhibitory immunoglobulin and higher thyroid microsomal antibodies, compared to controls. Pop et al⁷ observed that women with elevated TPO-Ab levels are more likely to develop depression. Bunevicius⁴ found higher scores of anxiety independent from their thyroid function in autoimmune disorders. Ruess⁸ showed presence of auto antibodies itself may produce abnormal behaviour even in euthyroid state. Maqbool Dar et al⁹ in an Indian study on 49 autoimmune thyroid patients, observed that 65.5% of patients had significant psychiatric morbidity compared to controls with depressive disorder (28.6%) as the most common presentation, followed by panic disorder (8.2%), 2 cases of OCD.

In a sample survey of 4181 adult subjects, Withauer et al¹¹ showed that subjects with subthreshold OCD or OCD showed higher prevalence rates of thyroid disorders. Gynas Ayhan et al¹² found the prevalence of depression, OCD and panic disorder was significantly higher than that in the controls in 51 patients with Euthyroid HT.

Till date, no case of OCD was reported with comorbid autoimmune thyroid disorder and Vitamin D deficiency. The present case is a paediatric OCD with Hashimoto's thyroiditis and Vitamin D deficiency. Her ASO titre was normal, ruling out the possibility of PANDAS. Other autoimmune disorders were not suspected clinically, hence not investigated. Vitamin D levels were lower than expected levels.

1,25-Dihydroxyvitamin D is a steroid hormone derived from vitamin D, plays an important role in maintaining an adequate serum level of calcium and phosphorus. Vitamin D is a modulator of both the innate and adaptive immune system. Vitamin D exerts an endocrine action on the cells of the immune system, generating anti-inflammatory and immune regulatory effects. The mechanisms underlying the role of vitamin D in autoimmunity are not completely understood. Lower vitamin D levels have been found in several autoimmune diseases. Only a few reports have analysed the supposed association between autoimmune thyroid diseases and vitamin D concentration with inconclusive results. Ke W et al¹³ in 175 patients with autoimmune thyroid diseases (AITD) found that compared with the controls, treated and mild HT patients had significantly lower 25(OH) D levels. Hu S et al¹⁴ found lower vitamin D status in HT patients than in controls and reported inverse relationships of serum vitamin D with TPO/Tg antibodies, a finding replicated in several other studies done recently.¹⁵⁻¹⁷ Kim et al¹⁵ in their study on 369 patients observed that low serum vitamin D levels were independently associated with high serum TSH levels, while some studies showed no such inverse relationship between TSH and 25(OH) D levels.^{13,18} In a review of Vitamin D and autoimmune thyroid disease, D'Aurizio et al,¹⁹ highlighted the role of vitamin D supplementation in prevention or improvement of AITD. Krysiak et al²⁰ in their study on 34 women with HT found improvement in thyroid antibody titres after treated with oral vitamin D supplementation. Unal et al;¹⁷ McCracken²¹ showed that when Paediatric OCD was treated with Clomipramine, significant improvement in thyroid function and suggested that pre-treatment TSH and T4 concentrations may be a considered as potential biomarker of OCD improvement. Mazokopakis²² considers screening for vitamin D deficiency and vitamin D supplementation when required for patients with Hashimoto's Thyroiditis. In our case, patient was already on Vitamin D3 and Thyroid supplementation before she came for treatment for OCD.

Conclusion

Paediatric OCD with comorbid Hashimoto's thyroiditis, and Hypovitaminosis D is a rare combination and highlights the need for evaluating Vitamin D levels in such cases. Validation in future studies is necessary.

Acknowledgements: Nil.

Conflict of Interests: Nil.

References

1. Fountoulakis KN, Lacovides A, Grammaticos P. Thyroid function in clinical subtypes of major depression. *BioMed Central Psychiatry*. 2004;4:6.
2. Bjoro T, Holmen J, Kruger O, Midthjell K, Schreiner T, Sandnes L, et al. Prevalence of thyroid disease, thyroid dysfunction and thyroid peroxidase antibodies in a large, unselected population. The Health study of Nord Trondelag (HUNT). *Eur J Endocrinol*. 2000;143(5):639-647.
3. Armengol MP, Juan M, Lucas-Martin A, Fernandez-Figueras MT, Jaraquemada D, Gallart T et al. Thyroid autoimmune disease: demonstration of thyroid antigen specific B cells and recombination-activating gene expression in chemokine-containing active intrathyroidal germinal centres. *Am J Pathol*. 2001;159:861-873.
4. Bunevicius R, Peceliuniene J, Mickuviene N, Bunevicius A, Pop VJ, Girdler SS. Mood and thyroid immunity assessed by ultrasonographic imaging in a primary health care. *J Affect Disord*. 2007;97:85-90.
5. Carta MG, Hardoy MC, Boi MF, Mariotti S, Carpiello B, Usai P et al. Association between panic disorder, major depressive disorder and celiac disease. A possible role of thyroid autoimmunity. *J Psychosom Res*. 2002;53:789- 793.
6. Carta MG, Loviselli A, Hardoy MC, Massa S, Cadeddu M, Sardu C, et al. The link between thyroid autoimmunity (antithyroid peroxidase auto antibodies) with anxiety and mood disorders in the community: a field of interest for public health in the future. *BioMed Central Psychiatry*. 2004; 4: 25.
7. Pop VJ, Maartens LH, Leusink G, van Son MJ, Knottnerus AA, Ward AM, et al. Are autoimmune thyroid dysfunction and depression related? *J Clin Endocrinol Metab*. 1998;83(9):3194-3197.
8. Reuss VI. Psychiatric aspects of thyroid disease; in Joffe RT, Levitt AJ (eds): *The Thyroid Axis and Psychiatric Illness*. Washington, American Psychiatric Press Inc, 1993, pp 171-194.
9. Mohammad Maqbool Dar, Sheikh Shoib, Haamid Bashir. Link between Psychiatric and Autoimmune Thyroid Disorder. *Int J Health Sci Res*. 2013;3(2):30-37.
10. Bozkurt NC, Karbek B, Ucan B, Sahin M, Cakal E, Ozbek M et al. The association between severity of vitamin D deficiency and Hashimoto's thyroiditis. *Endocr Pract*. 2013;19(3):479-484.
11. Witthauer C, T Gloster A, Meyer AH, Lieb R. Physical diseases among persons with obsessive compulsive symptoms and disorder: a general population study. *Soc Psychiatry Psychiatr Epidemiol*. 2014;49(12):22.
12. Giynas Ayhan M, Uguz F, Askin R, Gonen MS. The prevalence of depression and anxiety disorders in patients with euthyroid Hashimoto's thyroiditis: a comparative study. *Gen Hosp Psychiatry*. 2014;36(1):95-98. doi: 10.1016/j.genhosppsych.2013.10.002
13. Ke W, Sun T, Zhang Y, He L, Wu Q, Liu J, Zha B. 25-Hydroxyvitamin D serum level in Hashimoto's thyroiditis, but not Graves' disease is relatively deficient. *Endocr J*. 2017;Apr 11. doi: 10.1507/endocrj.EJ16-0547.
14. Hu S, Rayman MP. Multiple Nutritional Factors and the Risk of Hashimoto's Thyroiditis. *Thyroid*. 2017;27(5):597-610. doi: 10.1089/thy.2016.0635.
15. Kim D. Low vitamin D status is associated with hypothyroid Hashimoto's thyroiditis. *Hormones (Athens)*. 2016;15(3):385-393. doi: 10.14310/horm.2002.1681.
16. Mansournia N, Mansournia MA, Saeedi S, Dehghan J. The association between serum 25OHD levels and hypothyroid Hashimoto's thyroiditis. *J Endocrinol Invest*. 2014;37(5):473-476.
17. Unal AD, Tarcin O, Parildar H, Cigerli O, Eroglu H, Demirag NG. Vitamin D deficiency is related to thyroid antibodies in autoimmune thyroiditis. *Cent Eur J Immunol*. 2014;39(4):493-497.
18. Ma J, Wu D, Li C, Fan C, Chao N, Liu J. Lower Serum 25-Hydroxyvitamin D Level is Associated with 3 Types of Autoimmune Thyroid Diseases. *Medicine (Baltimore)*. 2015;94(39):e1639.
19. D'Aurizio F, Villalta D, Metus P, Doretto P, Tozzoli R. Is vitamin D a player or not in the pathophysiology of autoimmune thyroid diseases? *Autoimmun Rev*. 2015;14(5):363-369.
20. Krysiak R, Szkróbka W, Okopień B. The Effect of Vitamin D on Thyroid Autoimmunity in Levothyroxine-Treated Women with Hashimoto's Thyroiditis and Normal Vitamin D Status. *Exp Clin Endocrinol Diabetes*. 2017;125(4):229-233.
21. McCracken JT, Hanna GL. Elevated thyroid indices in children and adolescents with obsessive-compulsive disorder: effects of clomipramine treatment. *J Child Adolesc Psychopharmacol*. 2005;15(4):581-587.
22. Mazokopakis EE, Kotsiris DA. Hashimoto's autoimmune thyroiditis and vitamin D deficiency. Current aspects. *Hell J Nucl Med*. 2014;17(1):37-40.