Juvenile systemic lupus erythematosus co-existing with Hashimoto's thyroiditis in a 16-year-old Nigerian girl: Case report

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Abstract

This case report presents the rare occurrence of juvenile Systemic Lupus Erythematosus (jSLE) co-existing with Hashimoto thyroiditis in a 16-year-old secondary school female. The patient's initial complaints included a rash of three months' duration, joint pain and anterior neck swelling of one month. The clinical examination revealed presence of discoid lesions, and an enlarged thyroid gland. Laboratory investigations confirmed positive autoimmune markers for both SLE and thyroiditis. The treatment plan involved prednisolone, azathioprine, hydroxychloroquine, calcium/vitamin D3 and levothyroxine. This case highlights the diagnostic and management challenges posed by the co-existence of these autoimmune conditions in a juvenile patient.

Key words: Juvenile systemic lupus erythematosus, Hashimoto thyroiditis

Introduction

Systemic Lupus Erythematosus (SLE) is a chronic multi systemic autoimmune disorder that affects mainly women of child bearing age[1] however juvenile forms are being increasingly recognized, affecting about 15-20% of patients with SLE[2].

Hashimoto Thyroiditis (HT), also known as chronic autoimmune thyroiditis and chronic lymphocytic thyroiditis, is an autoimmune disease in which there is immune mediated destruction of thyroid cells[3] and is the most common form of thyroiditis in childhood[4].

Disorders of autoimmune pathogenesis occur with increased frequency in patients with a history of another autoimmune disease[5] and the co-occurrence of SLE with autoimmune thyroid disorders is well established in literature[6].

Here we present the case of a 16-year-old female with co-existing juvenile SLE (jSLE) and HT to prompt further enquiry into this overlap and also highlight the need to screen for overlap syndromes among paediatric patients with autoimmune disorders.

Case report

A 16-year-old secondary school student had been referred to the rheumatology clinic of University of Benin Teaching Hospital from a private hospital with complaints of rash of 3 months duration, joint pain and an anterior neck swelling of one month duration. Rash was of sudden onset, involving the upper extremities, pruritic in nature and not associated fluid discharge. There was no involvement of the oral cavity or features suggestive of ocular involvement and spared the palms and soles of her feet. Rashes were not preceded by nor were they accompanied by a history of fever. Joint pain had involved the knees and the small joint of the hands. They were worse on waking in the morning and following rest. She however did not have a history of joint swelling. Anterior neck swelling was noticed by the referring physician. It was described as painful but she had no dysphagia, odynophagia or change in quality of voice. There is a positive hx of cold intolerance but no weight loss or gain no tremors, palpitations or change in bowel habits. She had a history of recurrent pleuritic chest pain but denied a history of mouth ulcers, no malar rash, digital ulcers or Raynaud's phenomenon, or alopecia. Her past medical history revealed she was on management for depression at the Federal Neuro-psychiatric Hospital in Benin City.

Examination had a young lady who was ill-looking, and clinically pale. There were multiple discoid lesions involving both upper and lower limbs, largest appearing lesion measuring about 2cm by 4cm diameter on her scalp (Figures 1 and 2). She had an enlarged thyroid gland WHO grade 1B[7] (Figures 3 and 4) which was smooth, non-tender and not attached to the underlying or overlying

structure, moves with swallowing. There was no bruit on auscultation. There was no evidence of ocular proptosis, lid lag or retraction and/or ophthalmoplegia.

Figure 1: Discoid rash present on the arm

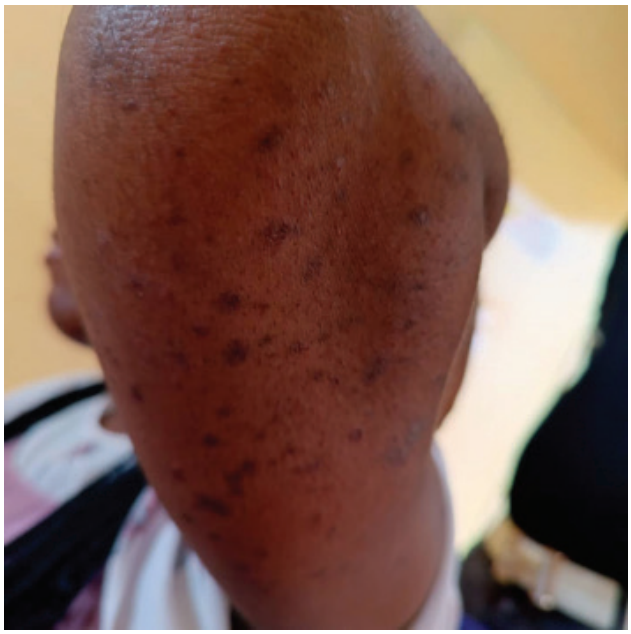
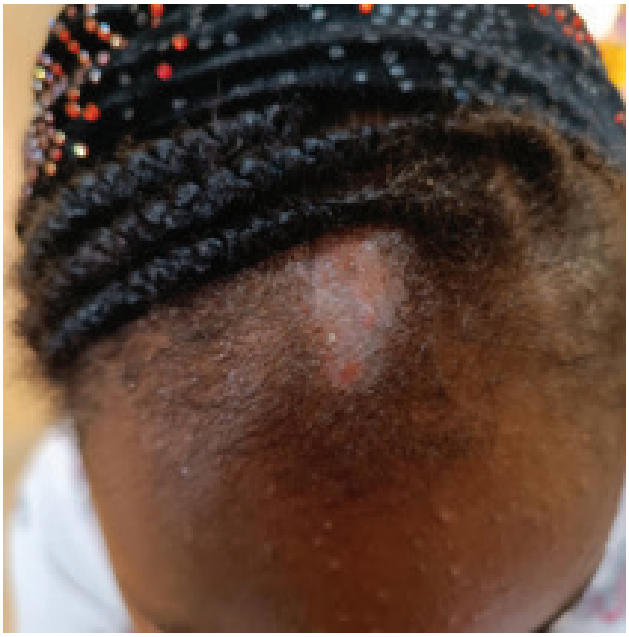


Figure 2: Discoid rash present on the scalp



Investigation results revealed a positive anti-nuclear antibody test with 1:640 titer (speckled and homogeneous pattern). Anti dsDNA was positive 285.55 (<100 IU/ml), Coomb test was positive, while rheumatoid factor was negative. She also had antibodies against thyroglobulin 972.72 (<4.11 IU/ML) and thyroid peroxidase enzyme > 1000 (<5.61 IU/ml). Her thyroid function test painted a hypothyroid state with the following values; thyroid stimulating hormone 227.115 (0.400 – 8.500 IU/L), triiodothyronine 4.28 (4.4 – 7.3 pmol/L) and thyroxine 2.53 (7.5 – 21.1 pmol/L). She had reduced haematocrit and haemoglobin concentration at 27.4% and 9.3g/dl respectively while her white cell count was slightly elevated at 12.2 x 10^{12}/L and erythrocyte sedimentation rate was 117 mm/hour. Her liver function test and electrolytes were within normal limit while retroviral, hepatitis B and C screen were negative. An ultrasound scan of the thyroid gland showed a uniformly enlarged gland with homogenous pattern suggestive of thyroiditis. Her electrocardiogram and chest x-ray were normal.

Figure 3: Anterior view of enlarged thyroid

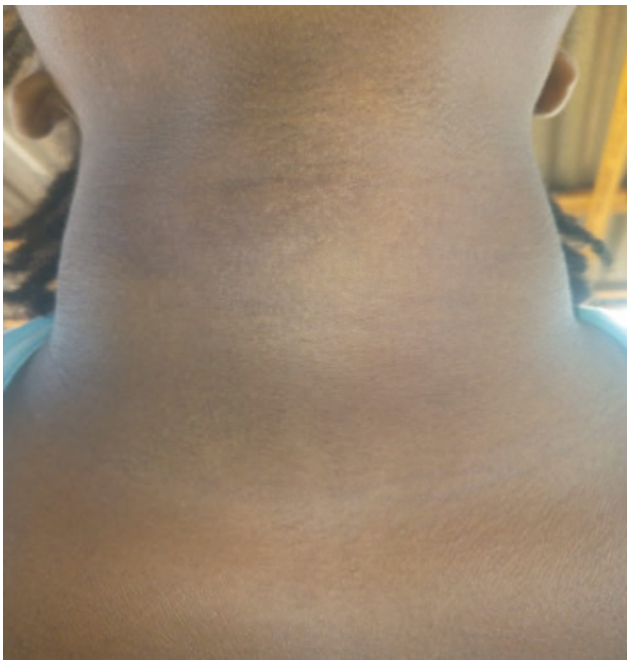
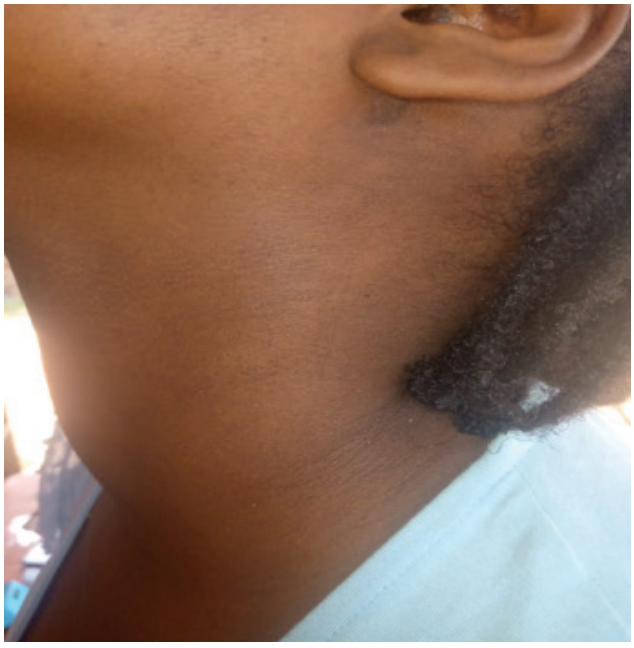


Figure 4: Lateral view of enlarged thyroid



An assessment of juvenile systemic lupus erythematosus (EULAR/ACR 2019 classification criteria) co-existing with Hashimoto's thyroiditis was made. She was commenced on prednisolone 30mg daily which was tapered over time, azathioprine 50mg twice daily, hydroxychloroquine 200mg daily, levothyroxine 100mcg daily, calcium/vitamin D3 and hematinic. She was also commenced on sunscreen SPF 50 and other sun

protective measures were advised. She was then referred to the endocrinologist for co-management with the unit.

Discussion

Systemic Lupus Erythematosus (SLE) is a multi-systemic autoimmune disorder with protean presentation affecting mainly women of child bearing age. However juvenile forms of the disorder are well recognized. Juvenile-onset systemic lupus erythematosus is a severe, chronic autoimmune disease with multi-system impairment that is diagnosed in people below the age of 18 years[8].

Although lupus is more prevalent in females, this predominance is less pronounced in the paediatric population with greater morbidity and mortality in this group[9]. Juvenile SLE also has a propensity to coexist with other autoimmune disorders which may not be readily recognized because of overlapping clinical features of the multiple co-existing disorders.

The new EULAR/ACR 2019 classification criteria use positive Antinuclear Antibodies (ANA) as an entry criterion and have weighted items, with weights ranging from 2 to 10. The items are organized in 7 clinical and 3 immunological domains and within each domain only the highest item is to be counted. A score of 10 and above is needed to classify as SLE. The rule is that items are to be attributed to SLE and counted only if there is no more likely alternative diagnosis[10]. The index patient fulfilled the entry criterion, had pain over multiple points, discoid rash and positive Anti dsDNA, weighted 6,4 and 6 respectively giving a total of 16; thus, meeting the classification criteria for SLE.

The diagnosis of Hashimoto Thyroiditis (HT) on the other hand relies on the demonstration of circulating antibodies to thyroid antigens (mainly thyroperoxidase and thyroglobulin), and reduced echogenicity on thyroid sonogram in a patient with typical clinical features[11]. The index case had an anterior neck mass, cold intolerance and presence of antibodies to thyroperoxidase and thyroglobulin hence the diagnosis of HT was made.

Studies have indicated that the prevalence of thyroid dysfunction is higher in SLE patients than in the general population and thyroid autoimmunity is recognized as the commonest type of organ-specific autoimmune disorder and can be associated with other autoimmune disorders one of which is SLE[12].

Autoimmune Thyroiditis (AIT) of which HT is a variant is the most common autoimmune thyroid disorder in the paediatric age range[13]. In paediatrics, the commonest age at presentation is adolescence[14] just like the index patient, but the disease may occur at any time during childhood. Thyroglobulin Antibody (TgAb) and Thyroid Peroxidase Antibody (TPOAb) are serological antibody markers for HT. A systematic review and meta-analysis by Pan *et al*[12] on the association between thyroid autoimmunity and SLE observed that SLE patients had a significantly higher prevalence of thyroid antibodies compared to controls (TgAb: OR 2.99; TPOAb: OR 2.20, respectively). This same review also noted differences in the association between SLE and thyroid autoimmunity across different populations. There was a positive association between TgAb and SLE among Caucasians but not in the Asian or African populations. Also, a positive association between TPOAb positivity and SLE was noted in the African and European populations but was not observed in the Asian or American populations[12]. Notably, SLE can have positive thyroid antibodies with or without overt thyroid manifestations however the index case had positive TgAb and TPOAb with clinical features of hypothyroidism[15].

The unifying pathophysiology between thyroid disease and SLE appears to be the immune predominance of T helper 1 (Th1) cells. Also, interferon gamma which is produced by Th1 cells and chemokines linked to it are found to be elevated in both SLE and autoimmune thyroid disorders[16].

There is a possible genetic link between SLE and thyroid disorders with concurrent SLE and thyroid disease observed in patients with the R620W polymorphism in the PTPN22 gene[16]. Additionally, a site on chromosome 5 (5q14.3–15) has been reported in a study of families with both SLE and thyroid disease to be a susceptibility gene common to the two disorders[17]. Deeper investigation is still needed, however, to detect the exact relationship between the pathogenesis of SLE and HT.

Even with the known association between autoimmune diseases and thyroid disorders, concurrent jSLE and HT is rare. One of the earliest studies evaluating thyroid disorders in SLE was in 319 SLE patients and thyrotoxicosis was observed in nine patients, three with hypothyroidism, and two patients had thyroiditis, suggesting an increased frequency of thyroid disorders in SLE patients[18].

Alves *et al*[19] in Brazil reported two cases of adolescents aged 11 and 13 years respectively with a previous diagnosis of HT who developed jSLE over a one-to-two-year period. A case series of SLE among Tunisian children identified one case of SLE associated with HT out of 14 jSLE patients[20]. A retrospective study in Sudanese children with HT, reported one case of simultaneous diagnosis of SLE and HT out of the 73 cases reviewed[21].

Symptoms of HT and SLE can be confused given that they both have nonspecific features, including fatigue, weight change, dry hair, and skin manifestations and studies have shown that delaying treatment of hypothyroidism can postpone remission of SLE[16]. In a case series on the clinical and laboratory response to prolonged cortisone therapy in HT, it was observed that signs and symptoms of the disease recurred on discontinuation of steroid therapy necessitating the use

of long-term hormone replacement to manage these patients[22]. Steroid therapy is core to the management of SLE however its role in the management of HT is limited to Hashimoto encephalopathy[23] and short-term use to regulate active thyroiditis, giving way to the more established treatment for HT, which is thyroid hormone replacement[24].

Conclusions

This case report highlights the rare co-existence of juvenile systemic lupus erythematosus and Hashimoto thyroiditis in a 16-year-old female, emphasizing the importance of recognizing overlapping autoimmune disorders in paediatric patients.

The concurrent occurrence of jSLE and HT warrants attention in clinical practice, as early identification and management are crucial for improved outcomes. This case report contributes to the existing literature, prompting further investigation into the relationship between juvenile SLE and HT. It also underscores the need for vigilant screening for overlapping autoimmune diseases among paediatric patients with autoimmune disorders, considering the potential impact on disease course and treatment strategies.

Further research is needed to unravel the genetic and pathogenic links between SLE and HT, enhancing our understanding of these complex autoimmune interactions in the paediatric population.

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