Section: General Medicine

Case Report

AN UNUSUAL CASE OF HEPATIC DYSFUNCTION IN GRAVES DISEASE

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Abstract

The thyroid overproduces and secretes too many thyroid hormones, a condition known as hyperthyroidism. Graves' disease is the most typical cause of hyperthyroidism. One frequent side effect in hyperthyroidism patients is liver damage. This report details a male patient, aged 37, who had cholestatic hepatitis and a history of hyperthyroidism. The report emphasizes how hyperthyroidism may lead to liver disease and how individuals with pertinent symptoms and test results should be evaluated for this relationship.

INTRODUCTION

There are very few documented cases of abnormal liver function tests in conjunction with thyroid disorders. These anomalies may represent a cholestatic profile or they may be non-specific.[1] This report details a male patient, age 37, who had cholestatic hepatitis and a history of hyperthyroidism. The report emphasizes how hyperthyroidism may lead to liver disease and how individuals with pertinent symptoms and test results should be evaluated for this relationship. The report's goal was to track Lithium carbonate's effects on Graves Disease patients who had suffered hepatic damage in terms of hyperthyroidism.

Initial Presentation and Patient History:

A 37-year-old man with no known comorbidities presented to the emergency department, Pushpagiri Institute of Medical Sciences and Research Centre, Thiruvalla, Kerala with a one-month history of vomiting, nausea, and upper abdominal pain. He also reported weight loss of 10kgs in 6 months, jaundice, and generalized itching for the past three weeks. He also gives a history of occasional alcoholism. His family history includes jaundice in his mother and brother No further details were available.

Physical Examination:

Upon examination, the patient had pallor, icterus, and was malnourished. He was afebrile with stable vitals. Gastro Intestinal Tract examination revealed a palpable liver which is non tender, rounded border, smooth surface, firm in consistency and a span of 15cm. The remaining systemic examination was unremarkable.

Laboratory Evaluation:

Laboratory investigations revealed anemia with Hb of 9.8g%. Anemia workup showed microcytic, hypochromic with evidence of toxic changes in neutrophils in the peripheral blood smear. Investigations also revealed elevated liver function tests with total bilirubin of 32.7mg/dl, direct bilirubin of 17.8 mg/dl, SGOT 135 IU/L, SGPT 118 IU/L, ALP 279 U/L, total protein of 5.6g/dl and albumin of 2.5gm/dl. He was also tested positive for urine bile pigment. Serologic test results cytomegalovirus, HIV, and hepatitis A, B, C, and D virus infection were negative. Iron studies were sent in view of microcytic hypochromic anemia which showed elevated serum ferritin levels of 1402 ng/dl and transferrin saturation of 75.3%, raising the possibility of Hemochromatosis. Furthermore, he was found to be heterozygous for H63D mutation in the Hereditary Hemochromatosis Gene (HFE) gene, which was not clinically significant. Ultrasonography showed hepatomegaly. Additionally, autoimmune markers, Antimitochondrial antibody, Anti soluble liver antigen, Anti liver cytosol antibody, anti-smooth muscle antibody test (ASMA), anti–liver-kidney microsomal antibody (Anti LKM), antinuclear antibodies (ANA) detected by indirect immunofluorescence assay (IFA) method (ANA IFA) were negative, but thyroid function tests indicated elevated levels (low TSH of <0.01IU/ML, high FT4 of 55 pmol/L) and positive thyroid receptor antibody (TRAB) OF 8.74 IU/L. A liver biopsy showed findings consistent with cholestatic hepatitis, with no evidence of autoimmune hepatitis with Perls' stain negative.

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Clinical Course:
The patient was started on Lithium 300mg TDS and further planned for radioablation once FT4 decreases. Serial monitoring of Liver Function Test (LFT) showed a decreasing trend thereby confirming the diagnosis of hyperthyroidism induced cholestasis. Once FT4 reached 40 pmol/l, radiofrequency induced ablation was done after explaining risks to the patient and the bystander in detail. Following the ablation, serial monitoring of LFTs demonstrated continued improvement, suggesting a successful resolution of the cholestasis.

DISCUSSION

In hyperthyroidism patients, cholestasis is an uncommon yet severe, complex illness. Severe cholestasis need prompt and precise treatment since it might lead to liver damage. It might be challenging to determine the underlying causes of cholestasis in hyperthyroidism patients in clinical practice. Cholestasis frequently results from thyrotoxicosis, while the underlying process is still unclear. Direct hepatocyte injury, co-morbid heart failure, associated autoimmune diseases, underlying liver disease, and antithyroid drugs are among the factors that contribute to liver dysfunction.[2] An increasing number of case reports involving thyroid diseases have indicated severe cholestasis and liver failure.[3] According to a recent study, hepatic impairment was linked to 65% of Graves' disease patients in varying degrees. The bile stasis type accounted for 32.4% of the cases, and 6.6% of patients had significant liver injury prior to receiving antithyroid medication (ATD) treatment (defined as ALT or aspartate aminotransferase levels ≥20 ULN, GGT levels ≥10 ULN, ALP levels ≥5 ULN, and/or TBiL, direct bilirubin (DBiL) levels ≥5 ULN).[4]
According to one theory, hepatotoxicity and cholestasis are brought on by oxidative stress resulting from a hyperthyroid condition. An additional hypothesis involves potential harm resulting from apoptosis mediated by mitochondria.[5] Propylthiouracil (PTU) and Methimazole (MMI) can induce liver injury in 0.1% to 0.2% of patients with hyperthyroidism.[6] Prior research indicated that MMI frequently resulted in cholestasis and PTU mostly caused hepatocellular damage.[7] According to a recent study, the MMI group had a higher frequency of the cholestatic type (35.3%) than the PTU group (17.9%) in patients with ATD-induced severe hepatotoxicity. As autoimmune mechanisms cause liver damage in 10% of Graves disease patients, individuals with autoimmune thyroid illness should have screening for additional autoimmune etiologies as part of their cholestasis workup.[8] However, it is important to screen out other liver diseases in individuals with hyperthyroidism and cholestasis, especially in countries where hepatitis B or C virus outbreaks are widespread.[9] According to a research by Kang et al,[10] a chronic hepatitis B virus carrier suffered acute liver failure caused on by MMI.
In addition to being used to treat mania and prevent recurrent manic-depressive disorders, lithium carbonate is also used as an adjuvant medication in clinics to treat hyperthyroidism because it inhibits the production and release of thyroid hormones.[9] Lithium carbonate with radioiodine therapy for Graves' Disease (GD) has apparently produced positive results.[11] According to a study, low-dose lithium carbonate is a safe and useful additional antithyroid drug that should be taken into consideration in cases that primary treatments for hyperthyroidism are not available.[12]

CONCLUSION

One unusual but possible symptom of Graves' hyperthyroidism is cholestatic jaundice. It is clear that there are several connections between the thyroid and liver, and patients who come with hyperthyroidism should have their liver disease properly diagnosed. When antithyroid medications are contraindicated for hepatic dysfunction, Lithium Carbonate in small dosages can help treat mild-to-moderate hyperthyroidism brought on by Graves Disease.

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