

Thorner's antagonism: A rare case of see-saw relationship between Myasthenia Gravis & Thyrotoxicosis

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Abstract: Although Thyrotoxicosis & myasthenia gravis are not unknown diseases, association of these two is rarely seen in the population. Rennie (1908) first reported a case of exophthalmia goiter & myasthenia [1]. Since then very few cases has been reported in literature. A small proportion of these cases exhibit a see-saw relationship i.e. mutually antagonistic properties between these two diseases. Melvin W. Thorner in 1939 first reported seven cases of Thyrotoxicosis & MG where presence of one condition seemed to inhibit or antagonize the other [2]. It was subsequently named Thorner's *antagonismo* [3] viz. when the manifestations of Thyrotoxicosis were at the peak, the symptoms of MG were minimum. As Thyrotoxicosis waned, symptoms of MG aggravated. Few more authors reported similar cases later. In most of these cases, the patient died a myasthenia death following thiouracil therapy [4] or subtotal thyroidectomy [5]. In this case, a 38 yr old male presented with symptoms of Thyrotoxicosis with myasthenia gravis; the former being pre-dominant. After initial treatment with anti-thyroid drugs, the myasthenia component namely muscle weakness & ptosis worsened with increased muscle weakness & progressive ptosis. He was started on oral Anti-cholinesterase agent & was taken up for Surgery in the form of thymectomy & total thyroidectomy following a short course of Plasmapheresis.

Case Summary:

A 38 years old male patient came for evaluation of palpitation & gradually progressive neck swelling for 18 months. Palpitations were more during summer & after heavy work. It was associated with heat intolerance; inability to perform fine work due to tremors in hands & fingers with hyperphagia. There was mild drooping of both upper eyelids for 6 months. On clinical examination he was tachycardia with fine tremors in both hand & tongue. There was diffuse enlargement of the thyroid gland moving up & down with deglutition with firm consistency, smooth surface & well defined margins. On auscultation, bruit was present over the gland.

In subsequent work up his thyroid profile showed a hyperthyroid status with FT3 6.51(0.8-2 ng/ml), FT4 19.86 (5.5-14 micro gm/dl) and TSH 0.005 (0.3-4.2). Serum Anti-TPO ab was very much increased (>1000U/ml). USG neck showed a diffuse enlargement of both lobes & isthmus of the thyroid gland with increased vascularity. He was started with Tab. Carbimazole 10mg three times daily. There was rapid worsening of the drooping of eyelids & progressive neck muscle weakness predominantly at the end of the day. There was inability to sustain open eyelid for >1 minute. Margin-reflex distance was less than 3 mm in both eye. Palpebral fissure-height examination revealed moderate ptosis in both eye. Serum Acetyl-choline receptor ab showed positive results. RNST (Repetitive nerve stimulation test) of right deltoid & left trapezius revealed decremental pattern i.e >10% rapid reduction of amplitude of evoked muscle action potential when electric shocks are delivered at a rate of 2-3/sec to corresponding nerves. It was suggestive of myasthenia gravis.

He was given Tab. Pyridostigmine along with Tab. Carbimazole keeping the mutual antagonism of these two diseases in mind. Subsequent CT-Thorax revealed a 2cm x2cm sized hypo dense enhancing lesion with contour abnormality in anterior mediastinum; suggestive of thymoma. He underwent a short course plasmapheresis for 6 days followed by total thyroidectomy & thymectomy by trans-sterna approach through median sternotomy. 4cm x 4cm tissue was dissected out from anterior mediastinum containing thymus gland and perithymic tissue. There was improvement of ptosis with muscle weakness and palpitation in immediate post-operative period and during hospital stay.

Discussion:

Myasthenia Gravis, an auto-immune disease was first described by Willis in 1685[6]. Since then many cases has been reported. But instances of its association with Thyrotoxicosis have been rarely reported in literature. Interest has been evident since the very first report of such kind of association by Rennie in 1908[1]. Although the antagonistic properties of this disease were first described by Thorner in 1939. Ben Cohen (1946) named this as THORNER'S ANTAGONISM [3]. Later on where MacEachern & Parnell(1948), Bartel's & Kingsley (1949), Maclean & Wilson (1954)[7,8,9] have showed similar kind of 'see-saw' relationship between these two diseases, Kowallis (1942)[10], Silver & Osserman(1957) have failed to appreciate the scenario[11]. Drachman (1962) reported that the eumetabolic status was optimal for a arthritic patient with MG and any deviation to hypo or hyper thyroid range is detrimental[12]. Harrison et al (18e, Principles of internal medicine) shows that hyperthyroidism can occur in 3-8% of patients of MG. Two possible mechanism can be appreciated. One is the direct action of thyroid hormone on immune system and the other is through triggered beta-adrenergic activity ultimately affecting innate immunity[13,14]. This hyperactivity of the adrenergic nervous system may play a role in pathogenesis of auto-immune disorders like MG[15]. Circulating auto-antibodies are increased, so tests like Kahn's or Wassermann may have false negative results[3].

Now although a few hypothesis are available for explanation of concurrence of these two diseases, the enigma of the 'see-saw' relationship is still yet to be explained. Immunologically, HLA DQ3 has been shown to have strong association with Thyrotoxicosis & MG, when behaving proportionate to each other [16]. But no such data is still available for patients showing antagonism of Thorner's. Also in our case we saw that both of these diseases should be treated simultaneously, medically as well as surgically under close monitoring.

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