Use of intravenous dexamethasone for thyroid exophthalmopathy

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Introduction

Thyroid eye disease (TED) often termed as Graves ophthalmopathy, is a part of an autoimmune process that can affect the orbital and periorbital tissue associated with abnormality of thyroid gland.[1] The condition primarily affects women and has an incidence of approximately 4/10,000 per annum. Thyroid ophthalmopathy is the commonest cause of unilateral and bilateral axial proptosis in young and middle aged adults. TED is commonly associated with hyperthyroidism (90%) and in few cases patients are euthyroid (6%).[2] Smoking is associated with an increased risk of development and severity of thyroid eye disease by 7-8 fold.[3,4,5] With increasing awareness of thyroid eye disease more cases of mild to severe grades of thyroid eye disease are being diagnosed and treated. TED is an autoimmune disorder commonly associated with ophthalmopathy, characterized by periorbital edema, unilateral or bilateral proptosis, extra-ocular muscle dysfunction, keratitis and optic nerve compression. Pathogenesis of Graves' ophthalmopathy is related to autoimmune reactions directed to orbital antigens, in particular to eye muscle[6-8] and accumulation of glycosa-aminoglycans. On the basis of the immunological mechanisms producing the inflammatory changes in the orbit, attempts have been made to control the immunological reactions of glycosa-aminoglycans with immune-suppressive drugs such as corticosteroids[9], cyclophosphamide[10] and cyclosporin A[11-13] and with plasma exchange[14] for the treatment of glycosa-aminoglycans or its prevention[15].

TED is a refractory condition, such patients often visit many eye specialist and are treated with various medications such as topical and oral steroids, lubricants and decongestants. We report the role of intravenous pulse dexamethasone followed by oral prednisolone for patients with TED and proptosis.

Materials and Methods

We reviewed the data of patients of thyroid eye disease who were treated at our hospital from 1st June 2015 to 31st May 2016. A total of sixteen patients were admitted with acute exacerbation of thyroid eye disease. Clinical records including symptoms, past history, family history was noted. The signs were documented from the case sheets. Data was tabulated and analyzed.

All the patients received three doses of high dose dexamethasone (50-100 mg) intravenous followed by oral prednisolone (1mg/kg) tapered over 45 days as per records. Along with eye treatment all patients were treated for accompanying thyroid hormone level abnormality.

Proptosis was measured using Hertels Exophthalmometer. All the patients underwent detailed bio-chemical and pathological blood investigations such as complete blood count, erythrocyte sedimentation rate, fasting and post prandial blood sugars. Liver and renal function test were conducted prior to initiate treatment. All patients underwent an X-ray chest to rule past or active tuberculosis. All patients were admitted and treated as indoor patients. Clinical photographs were taken and proptosis was noted. All the patients were followed up at 3 and 6 months.

Results

The mean age of presentation was 44.13 years. The mean time duration of presentation after symptomatic proptosis was 1.86 months (longest being 7 months). All the 16 patients in our study were hyperthyroid with values of free T3 and T4 higher than normal. All the patients responded favorably to treatment with varying degree of decrease in proptosis. The patient was started on eyedrop timolol (0.5%) and brimonidine (0.15%) BD and IOP decreased to 18 mm Hg OU. The glaucoma medication was continued even at 6 month follow up. Two patients had accompanying diabetes mellitus which was controlled using insulin. The mean pretreatment proptosis was 24.5 mm OD and 24.19 mm OS and post treatment at 6 months, the mean proptosis was 22.69 mm OD and 22.25 OS.

Discussion

It is now accepted that TED has an autoimmune pathogenesis. Treatment of thyroid related ophthalmopathy involves treatment of underlying thyroid dysfunction, control of sympathetic symptoms and treatment for ocular disease. In our study the mean proptosis of the right side decreased from 24.5 mm to 22.69 mm and the mean proptosis of the left side decreased from 24.19 mm to 22.25 mm after three doses of pulse dexamethasone followed by tapering oral prednisolone (1mg/kg) therapy over 6 weeks. Our results are similar to the effect seen with methylprednisolone in earlier studies.[16-18] In few of the Indian studies methylprednisolone was replaced with dexamethasone because it is cheaper with similar results. So we decided to use dexamethasone and observed similar results. The benefit appears to be related to the duration of disease at presentation. Patients who receive pulse dexamethasone earlier tend

to have more benefit in decrease of proptosis. Thus mean age of presentation may be a prognostic factor for treatment.

In addition Kendall- Taylor et al.[17] reported distinct improvement in eye signs of glycosa-aminoglycans with treatment based on intravenous methylprednisolone in eight of 11 patients with active glycosa-aminoglycans, which was also confirmed very recently by Dandona et al.[18] who showed a reduction in the exophthalmos in their glycosa-aminoglycans patients. In the present study we have obtained comparable results using dexamethasone pulse therapy in the treatment of active thyroid eye disease.

Our study has the constraint of lesser subjects and retrospective analysis, so larger prospective studies may be warranted to provide more conclusive data. Nevertheless in our study all patients showed significant improved in congestion, ocular motility, and decreased ocular inflammation. There were no major side effects except increase in blood sugar levels of two diabetic patients which was expected and controlled using insulin therapy.

We conclude that intravenous pulse steroid therapy may have a role in treating severe exophthalmos if there are no contraindications. Control of associated diabetes mellitus, hyperthyroidism, hypertension, peptic ulcer disease should be done as may be required. Strict monitoring is required for possible side-effects of high dose steroids. Analysis of data reveals that early presentation may be a good prognostic factor for decrease in proptosis.

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