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Research Paper

Ocular Side-Effects of Corticosteroids Long Time Used- Report Case

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Abstract: The use of Corticosteroids is extended very wide. They are used in various types of diseases like: Arthritis, Rheumatic Carditis, Systemic Lupus Erythematosus, Urticaria, Asthma, Sarcoidoses, Cerebral Oedema, Thrombocytopenia, Organ Transplantation, COVID-19 *etc*. In prolonged use due to the suppression of the pituitary we can have much more side effects compared with the short term therapy. That's why we need to take care very much and that's why in most of the cases the corticosteroids are used when simpler therapy has failed or in life threatening situations. This medicament should be used with great care, sometimes like to call them the edge of the blade cut in both sides. In this article we are going to speak and discuss for the ocular side effects of corticosteroids. This is a retrospective study. In this study we have represented a case study. In this study we report a case of steroid induced cataracts following prolonged unsupervised administration of long therapy with corticosteroids of a female patient 63 years old. This is descriptive case study with pseudo tumor that has the first clinical signs on 1998. The clinical history represented is 1998-2008. The biopsy confirmed two inflammatory pseudo tumors which explained her pain and suffering, visual loss and diplopia. For differential and final diagnosis, the patient has done all examinations like: physical and ophthalmologic, blood tests, radiologic examination, RMI, CT scan, x-ray. During this time after a long term therapy with corticosteroids and antibiotics the patient developed the year sub capsular cataract. For elaboration of all data we used the Microsoft office 2010.

Keywords: *corticosteroids, ocular, side effects.*

Introduction

Glucocorticoids represent the standard therapy for reducing inflammation and immune activation in various diseases. However, as with any potent medication, they are not without side effects. Glucocorticoid-associated side effects may involve most major organ systems. Musculoskeletal, gastrointestinal, cardiovascular, endocrine, neuropsychiatric, dermatologic, ocular, and immunologic side effects are all possible. The most common ophthalmologic side effects are cataract and glaucoma. (Oray *et al.,* 2016)

The glucocorticoid treatment produced elevated intraocular pressures more often in glaucoma patients than in normal individuals. Testing of family members showed that this response was inherited as an autosomal recessive trait. (Becker & Hahn, 1964)

In Ophthalmology we have to face with the side effects of systematic corticosteroids or and local corticosteroids. Corticosteroids are used for both reasons: anti-inflammatory and/or immunosuppressive action. Topical, periocular, and systemic steroids may cause ocular complications, including cataracts, glaucoma, opportunistic infections of the eye, and delayed corneal healing. Less common ocular sequelae of steroids include exophthalmos; ocular muscle palsy; blue sclerae in children; refractive changes; pseudotumor cerebri; hypertensive retinopathy; and ptosis, chemosis, and lid swelling associated with moon fades. The prevention of ocular complications due to steroids is best managed by an ophthalmologist through routine examinations and intraocular pressure measurements. (Renfro, 1992)

The adverse effects of topical steroid administration to the eye are well known and include glaucoma, cataract, exacerbation of corneal infection, and systemic effects secondary to systemic absorption, reactivation or exacerbation of herpes simplex keratitis, risk of other infections. (Butcher *et al.,* 1994)

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Because of the anti-inflammatory properties of glucocorticoids, they are often used topically and/or intra vitreally to treat ocular inflammation conditions or edema associated with macular degeneration and diabetic retinopathy. Unfortunately, ocular glucocortico therapy can lead to severe side effects. (Dibas. & Yorio, 2016)

Topical ophthalmic, oral, and intravenous corticosteroids have long been associated with ocular side effects. Recent data suggest that inhaled corticosteroids are also associated with the development of cataract and increased intraocular pressure. Local injection of steroids, even at sites far from the eye, have been associated with the development of cataract, glaucoma, and even retinal and choroidal emboli (Carnahan, 2000).

Posterior Subcapsular Cataract caused by Corticosteroids is well known. If the prevalence of the posterior subcapsular cataract in the general population is about 0.5%, in patients using corticosteroids for more than five years we have encountered it in 28%.

Another ocular side effects associated with corticosteroids used for a long time is a sclera thinning and discoloration. In some patients also we can see microcysts in the iris pigment epithelium. This complication is faced more in patients with diabetes. In rare cases we have faced also with exophthalmia which is generally present in patients with Cushing's disease.

If we doubt that exophthalmus is as a side effect of systemic corticosteroid we need to make a differential diagnose in order to exclude Pseudo tumors or possibly retroocular masses, Thyrotoxicosis. The Paradox of those rare cases is if we consider that the exophthalmos of Grave's Disease is often treated with corticosteroids.

Glaucoma also rarely but can come as a complication of use of systemic corticosteroids. Lots of authors has published case studies with patients founded with high eye pressure during the time they are using corticosteroids. In some times we speak also of white steroids emboli in the retinal vessels. Diplopia, inferior rectus palpus, scotoma, and eye pain can be other complications of the long used of corticosteroids (Armaly, 1966).

Regarding the local use of Corticosteroids like Dexamethasone, Fluorometholone, Prethnisolone, or combination of steroids with antibiotics in long term use of them also we can observe a posterior capsular Cataract as complication.

Systemic glucocorticoids are an essential therapy for a range of conditions, but their multiple side effects can produce significant morbidity for patients (Caplan *et. al,* 2017).

Glucocorticoids are powerful and cost-effective drugs for the treatment of various rheumatic diseases. Several adverse effects limit the successful therapeutic use of glucocorticoids, especially if used at high doses for long periods of time. (Stahn, 2008; Hoes *et al*. 2007)

Material and Methods

This is a retrospective study. In this study we have prescribed the evaluation of long therapy with corticosteroids of a female patient 63 years old. This is descriptive case study with pseudo tumor that has the first clinical signs on 1998. The clinical history represented is 1998-2008. The biopsy confirmed two inflammatory pseudo tumors which explained her pain and suffering, visual loss and diplopia. For differential and final diagnosis, the patient has done all examinations like: physical and ophthalmologic, blood tests, radiologic examination, RMI, CT scan, x-ray. During this time after a long term therapy with corticosteroids and antibiotics the patient developed the year sub capsular cataract. For elaboration of all data we used the Microsoft office 2010.

Results and Discussion

Female patient 63 years old from Albania, has been bothered by the right sided cheek pain initially in 1998 then developed gradually over 6 months associated with some mild tiredness towards the end of the day. The pain radiated her right temple and following a Caldwell-Luc procedure, resolved and left her symptoms free, apart from occasional pain for 7 years.

Then the patient developed right side facial pain that became severe over 4 months in 2005. This began around June with the distribution on her right nose, forehead and cheek. On the 8th of December 2005, she underwent a right ethmoidectomy and sphenoidotomy.

Since this procedure the patient has been aware to continue to experience severe right frontal headache involved with eyelid swelling. She also points out that over the last three months the vision in her right eye has been blurred. Her alcohol intake was minimum and at that time she stopped

smoking six months prior. Previously she used to smoke 20 cigarettes a day. On review on her medication she had recently completed a course of Azithromycine and Augumentin. Afterwards she took medication for systemic hypertension and analgesia only.

On the day of her examination, her corrected vision was 6/7.5 pinhole 6/6 in the right and 6/6 in the left. Her optic function was normal (normal ishihara pupil response and visual fields to confrontation). My main finding was of right proptosis with mild lateral globe displacement of no more than 1 mm. She had light exophthalmia. She also had marked right upper eyelid ptosis with reduced elevator function and numbness over her right forehead particularly involving the supraorbital and supratrochlear nerves. However, she also experienced changed sensation around the temporal aspect of the orbit as well as cheek area on the right side.

Her eye movements were restricted more so for up gaze than down gaze but also for abduction in the right eye.

Her anterior segment in slit lamp examination was essentially normal with tortuous conjunctive vessels at both medial aspects on the right and left side and her intraocular pressures were 13 mm Hg in both eyes. Her dilated fundus examination was normal.

Following this, we also carried out a syringing of the right lacrimal system and found this to be patent and her endoscopic endonasal examination was normal apart from some mild nasal crusting at the anterior nasal space on both sides.

At the time, we were grateful for receiving the copies of her blood test showing that she had very mild normocytic anemia with hemoglobin of 11.2. I saw that her ESR was normal and that her ANCA was raised at 27.8 U/ml (normal range less than 10 U/ml).

We have had the opportunity to review her MRI scans taken both in February and also in May 2008. The MRI scan showed right ethmoid sinus disease adjacent to medial orbital wall and in association with this she had enlargement of her right superior oblique muscle with some mild enlargement of the medial rectus adjacent to this. The scans in May showed marked progression of disease with soft tissue infiltrative disease involving the super medial orbit extending beyond the superior rectus and below the medial rectus as well. Without CT scans, it was difficult to comment on bone erosions however this enhancing infiltrate which is only minimally brighter in T2 sequences appeared adjacent to ethmoid sinus disease with a thin separating line that may have well represented bone or possibly periostium.

We have done differential diagnosis at the time was of Wegener's granulomatous however midline granuloma and lymphona needed to be excluded. We thought that a primary sinus neoplasm involving the orbit was unlikely in view of the lack of significant sinus involvement and predominance of orbital disease. Thirdly of course the possibility of secondary infection existed however in view of her clinical picture as well as the raised ANCA my suspicion rested with Wegener's at that stage.

We arranged to carry out an anterior orbitotomy and biopsy of her medial orbital tissue as well as ethmoid sinus infiltration on the 3rd of July 2008 at the MSC and delivered the specimen to the institute of ophthalmology for examination. Her chest x-ray looked normal which was reassuring. The biopsy confirmed two inflammatory pseudo tumors which explained her pain and suffering, visual loss and diplopia.

At that moment, we prescribed a treatment with prednisolone, initially 10mg/daily for two weeks. Gradually the doses of prednisolon were reduced until two months later, when the patient was only taking 2.5 mg per day.

After the treatment finished, the clinical symptoms were reduced, diplopia was no longer existent and the visual equity was reestablished at 6/6 N. We were forced to continue the treatment with cortisone, since the patient was feeling much better while using it.

Three years later, even though the patient was satisfied she did not feel pain neither had any other concerns causing suffering however, she noticed a vision loss to a certain degree. On the examination with a slit-lamp we realized the subcapsular cataract, which I removed in one-year time (Phacoemulsification with lens implant). The vision equity was back to 6/6 N.

Conclusion and Recommendations

The use of systemic and local Corticosteroids for a long time can make us face a lot of side effects. In such conditions we recommend the patients which use Corticosteroids to make at least once a year an eye check.

Rheumatologists, Endocrinologist and family doctors etc must be careful for the use of Corticosteroids with the right doses and time, keeping into consideration the side effects in Ophthalmology. Any physician prescribing corticosteroids should be aware of these potential ocular side effects and should advise patients accordingly.

Steroids are invaluable agents in the treatment of a diverse spectrum of disorders; however, their use is not without risks.

The risk/benefit ratio of corticosteroid therapy can be improved by proper use of corticosteroids.

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