Original Article

The effect of corticosteroids on macular edema in patients with noninfective uveitis

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ABSTRACT

This study aims to identify the effect of corticosteroid injections in the treatment of macular edema in patients with non-infective uveitis. This is a retrospective study and all the data was collected from medical data of the patients in a private clinic in Tirana. Patients with macular edema secondary to non-infective immediate, posterior, or panuveitis who were treated with corticosteroids were included. We compare the OCT of the patients before and after the treatment with corticosteroids. Other data included age, causes of uveitis; best-corrected visual acuity before and after treatment, and intraocular pressure before and after corticosteroid treatment. Data were analyzed by SPSS.

Best correction visual acuity was improved after corticosteroid therapy. In OCT we identify a significant reduction of central macular thickens. Only one patient developed an intraocular pressure of more than 30 mmHg one month after corticosteroid injection. The use of corticosteroids in the treatment of macular edema in non-infective uveitis had good improvement in visual acuity and reduction of central macular thickness.

Keywords: Uveitis non-inflammatory, Macular edema, Corticosteroids, Treatment, Albania

Introduction

Uveitis represents a large group of intraocular inflammatory diseases, which involves the uvea. The incidence of uveitis nowadays may be higher than previously [1]. Uveitis is an important public health issue because of the visual loss that can cause, which affects the quality of life. About 10% of cases are reported blind from uveitis in the USA and 3% to 7% to Europe [1, 2]. Permanent visual loss from uveitis can be prevented by having control over inflammation of the eye [3]. However, management models vary depending on specific conditions. An accurate diagnosis is the first step in determining proper management.

Our study aims to evaluate the efficacy of corticosteroids treatments in uveitis macular edema (UME) with non-infectious etiology.

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Materials and Methods

In this retrospective study, the clinical data of patients with macular edema due to posterior and/or intermediate uveitis or panuveitis with non-infectious etiology were treated with corticosteroids was also included. The study covered a period from November 2019 to December 2021. Clinical data were obtained from the department of ophthalmology in a private clinic in Tirana.

Clinical data

The clinical data obtained in the database of the clinic included; the age of the patients, gender, follow-up period, anatomical classification of uveitis (intermediate uveitis, posterior uveitis,

or panuveitis), specific diagnosis (cause), corticosteroid therapy.

In some cases, serological test data for syphilis and Lyme disease, thoracic radiography, and titration for viral antibodies were obtained from clinical records. All patients underwent a general ocular examination at their first visit and re-examinations after corticosteroid treatment.

The data collected included the following: (1) Central retinal thickness (CRT) was measured by spectrum with the OCT domain. (2) Best-corrected visual acuity (BCVA) that was performed using the Snellen chart. For statistical analysis and comparison purposes, the visual acuity was equated to the logMAR equivalent. (3) Biomicroscopic examination had determined anterior chamber complications from uveitis. (4) Intraocular pressure was measured using Goldmann applanation tonometry. Treatment of non-infectious uveitis was performed with corticosteroid subtenon-injected (3 injections, for a period of 6 months).

Statistical analysis

The chi-square test was used to compare data and improve BCVA in patients treated with corticosteroid therapy. Missing data was not replaced but rather excluded from the study. A value of P≤ 0.05 was considered a statistically significant value. Statistical analyzes were calculated using the SPSS system from the software version of Windows 24.

Results and Discussion

From 15 patients who were presented to the clinic, it was observed that 24 eyes were treated for uveitis macular edema. The mean age of the patients admitted was 57 ± 14 years. Only 2 cases were presented as panuveitis. 67% of the patients with non-infectious uveitis had an idiopathic cause, 7% of which were from sarcoidosis and 27% from other systemic conditions. Only 37% of the patients taken into the study were pseudophakic patients.

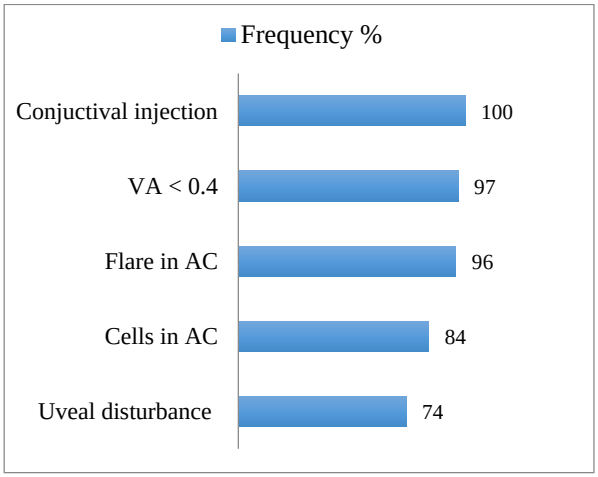
General data of the patients can be seen in **Table 1**.

Table 1. Demographic data of patients with uveitis macular edema.

Characteristics	Number (%)
No. Patients	15 (100%)
No. eyes	24
No. injections	67
Age	
Mean ± SD	57 ± 14
Amplitude	24 – 88
Uveitis, anatomical classification, no of eyes (%)	
Intermediate	5 (33)
Posterior	8 (53)
Panuveitis	2 (13)
Causes	
Idiopatic	10 (67)
Sarcoidosa	1 (7)
Other	4 (27)
BCVA (logMAR) Mean ± SD	0.67 (0.4)
CRT Mean ± SD	563 ± 153
IOP (mmHg) Mean ± SD	14 ± 4.1 Frequency (13 – 32)
Lens, no of eyes (%)	
Phacic	15 (63)
Pseudophacic	9 (37)

IOP (Intraocular pressure) measured with Goldman (mmHg) was reported at 14 ± 4.1 SD. The IOP frequency ranged from 13 – 32 mmHg, in our study only one patient presented with IOP > 30 mmHg (respectively 36 mmHg after 3 corticosteroid injections).

In **Graph 1**, we have the presentation of clinical signs in the percentage of patients with uveitis macular edema. The conjunctival injection was identified in all patients. Decreased vision below 0.4 was observed in 97% of patients. The presence of anterior chamber disturbance (flare and/or cells) and vitreous disturbances were present in more than 50% of patients with uveitis macular edema.



Graph 1. Frequency of clinical signs in patients with uveitis macular edema.

In **Table 2** you will see the correlation of central retinal thickness (CRT – Central Retinal thickness) with the number of corticosteroid injections. Patients over a period of 6 months underwent corticosteroid therapy (subtenon injection), for a total of 3 injections.

As we can see from **Table 2**, the number of patients undergoing corticosteroid therapy decreases from the first injection (15 patients) to the third injection (5 patients).

After each subtenon injection with a corticosteroid, we see a reduction in uveitis macular edema, which in **Table 2** is measured by the central retinal thickness. In all three injections, post-injection CRT reports show an improvement, which is statistically significant after each injection, with a P-value < 0.001.

Table 2. Correlation between the number of corticosteroid injections and central retinal thickness

Subtenon injection therapy	Corticosteroid 1 injection	Corticosteroid 2 injection	Corticosteroid 3 injection
CRT Mean ± SD (before injection)	463 ± 142	458 ± 132	481 ± 32
No. patients	15	8	5
CRT Mean ± SD (after injection)	388 ± 106	309 ± 66	345 ± 121
P-value	<0.001	< 0.001	< 0.001

Table 3 shows the mean of IOP measured after corticosteroid injection (after each injection). As we can see, we have an increase in IOP after injections, but this is not statistically significant. From 15 patients treated for uveitis macular edema, only one patient presented with high IOP > 30 mmHg (32 mmHg), evidenced after the third injection with corticosteroid therapy.

Table 3. IOP after corticosteroid injections

	Corticosteroid injections		
	I injection	II injection	III injection
IOP (Mean ± SD)	14.6 ± 4.9	15.2 ± 5.3	17.3 ± 14.3

Table 4 shows the average of BCVA improvement calculated in logMAR. We see that after each injection of corticosteroid there is an improvement in the visual acuity of the patients. We did not find any statistically significant data on injection-based visual acuity improvement.

Table 4. BCVA improvement after corticosteroid injections

	First visit	Corticosteroid injection		
		I injection	II injection	III injection
BCVA (logMAR)	0.67	0.84	0.78	0.81
		Mean		

The finding of treatment with corticosteroids in non-infectious uveitis with macular edema in our study has shown good results in visual acuity and improvement of CRT (central retinal thickness).

Because inflammation of the posterior segment is often chronic, affected patients usually require ongoing treatment for several years; this is impossible in our study retrospective evaluations have been made, based on clinical records.

The main problem of patients with non-infectious uveitis is CME, which is often asymmetric and affects approximately one-third of patients [4], therefore intraocular steroids are the first choice for treating these patients, as was also selected in our study. Other studies have presented the same treatments for uveitis macular edema as in our study [5]. CRT (central retinal thickness) was chosen as the point to verify the effect of the treatment, as it was presented as the main cause of decreased vision [4, 6]. The results of our study evidenced statistically significant improvement in CRT reduction in patients with uveitis macular edema and improvement in BCVA after corticosteroid treatment. Other studies have shown similar results [5, 7].

Several studies have differentiated the causes of uveitis and the correlation with EMU after treatment with corticosteroid [8]. Other studies have found a slight tendency toward reduction of visual acuity in patients after the treatment with corticosteroids [9] however, this was the case in our study.

Some articles had found an improvement in BCVA with the decrease of CRT after corticosteroids treatment [10, 11], this was also found in our study, where the improvement in VA was proportional to the decrease in CRT.

Other studies have shown an increase in IOP (intraocular pressure) after corticosteroid treatment [12]. In our study, only one patient reported IOP > 30 mmHg.

The aim of the treatment in patients with non-infectious uveitis should be to reduce ocular inflammation for as long as possible. To reduce the disease the exact diagnosis of the patient with non-infectious uveitis should be done [13, 14]. In our study, the exact diagnosis of patients was not determined in all cases. But corticosteroid therapy worked effectively giving us positive results both in lowering CRT and improving visual acuity.

Conclusion

Best correction visual acuity was improved after corticosteroid therapy. In OCT we identify a significant reduction of central macular thickens and only one patient developed high intraocular pressure one month after corticosteroid injection. Conclusively, corticosteroid therapy in the treatment of macular edema from non-infectious uveitis is the first line of therapy due to its efficacy.

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Ethics statement: None

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