UNIVERSITY OF BIRMINGHAM

Sandwell and West Birmingham Hospitals NHS





The assessment of Deep Intramuscular Methylprednisolone for the Treatment of Cystoid Macular Oedema

Authors: Kusy Suleiman[1], Sarah Arif[2], Robert J Barry[3], Philip I Murray[4]

[1]: Academic Unit of Ophthalmology, Birmingham and Midland Eye Centre, City Hospital, Birmingham, UK.

Background

Cystoid Macular Oedema (CMO) as a complication of anterior uveitis is one of the most common causes of central visual loss and blindness (1).

Treatment for CMO is not well established and surrounded by controversy. (2) High dose oral corticosteroids, orbital floor injections or intraocular steroids are commonly used as initial management of CMO. However these are associated with unacceptable side effects profile and have partial success in resolving CMO. Deep intramuscular-methylprednisolone injection (IMMP) has been utilised as a treatment modality at BMEC for many years with good success rate as it provides effective CMO resolution whilst minimising side effects and complications. There are almost no randomised double blinded controlled studies to determine the most effective treatment for CMO in patients with Uveitis. Thus it is difficult to determine whether IMMP is the most effective treatment.

We carried out this study to determine whether there is a significant reduction in CMO following IMMP injection, utilising both change in visual acuity in addition to macular oedema resolution/improvement on OCT imaging to provide us with objective parameters in ascertaining changes as opposed to utilising slit-lamp assessment only (3).

Aim

To assess the use of 160mg intramuscular methylprednisolone in the treatment of cystoid macular oedema in patients with Uveitis.

Measurable Outcomes

1. The improvement of >= 2 lines Snellen acuity in the the affected eye following deep IMMP.
2. A reduction in Central Macular Thickness (CMT) following deep IMMP.

Methods

- **Study Type:** Retrospective case note review and observation study.
- **Study Setting:** Birmingham Midland Eye Centre (Specialist eye hospital) .
- **Clinical Collection Tool:** City hospital Clinical portal (CDA-Clinical data archive).
- **Data Collection:** Contacted the coding team to request patient identification numbers for all CMO patients who have had IMMP injections between December 2008 - December 2018 at BMEC.
- **Confirmation of Patients Included:** Patient coded data was cross-referenced and checked against records kept with the nursing staff regarding IMMP drug administration kept in confidential book-record.
- **Analysis:** Data was collected and analysed using Microsoft Excel.

Results and Discussion

Participant Demographics

- A total of 54 patients and 60 eyes treated by IMMP (6 patients had CMO in both eyes).

Table 1: *Age of Participants*

Age	Number
Mean	51
Range	20-80

Table 2: *Gender of Participants*

Gender	Number
Male	21 (39%)
Female	33 (61%)

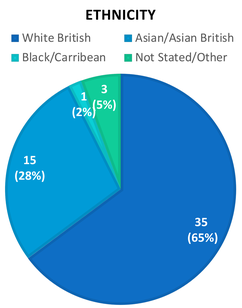
Table 3: *Laterality of Eye Disease*

Laterality of CMO presentation	Number
Unilateral	48
Bilateral	6

Table 4: *Affected Eye distribution*

Affected Eye	Number
Right Eye	31
Left Eye	29

Graph 1: *Participant Ethnicity:*



Graph 2: *Uveitis Subtypes:*

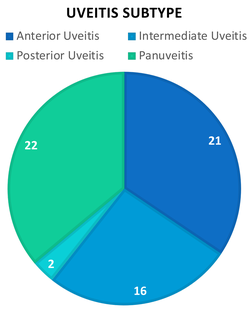
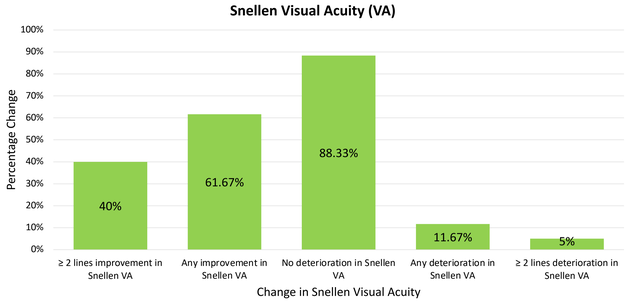


Table 5: *Aetiology of uveitis in participants with presenting with CMO*

Disease/Condition	Frequency
Sarcoidosis	6
Multiple Sclerosis	3
Psoriatic HLA B27	3
Juvenile Idiopathic Arthritis	2
Post-operative	2
Tuberculosis	2
Acute Retinal Necrosis (Secondary to HZO)	1
Reiter's Disease	1
Idiopathic	1

Change in Visual Acuity on first follow up

Graph 3*: Snellen Visual Acuity Change*



Reference

1. Freeman G. Cystoid macular oedema in uveitis: An unsolved problem. Eye. 2001;15(1):12-17.
2. Tehrani N, Saeed T, Murray P. Deep intramuscular methylprednisolone for the treatment of cystoid macular oedema in uveitis. Eye. 2000;14(5):691-694.
3. Antcliff R, Stanford M, Chauhan D, Graham E, Spalton D, Shilling J et al. Comparison between optical coherence tomography and fundus fluorescein angiography for the detection of cystoid macular oedema in patients with uveitis. Ophthalmology. 2000;107(3):593-599.

Table 6: *Snellen line improvement*

Snellen Lines of Improvement	Number of Participants Improved
1 Line	13
2 Lines	12
3 Lines	10
4+ Lines	2

- Note- Percentage of participants reaching UK driving standard or better on follow-up as a result of intervention: 72%

Change in Central Macular Thickness (CMT) on OCT imaging

- Out of the 60 total eyes, 3 eyes were excluded from analysis due to lack of OCT imaging at either at baseline, or during follow-up.
- Objective change in CMT of 57 eyes utilising OCT imaging technology showed a reduction in 84.21% of eyes following deep IMMP.
- Overall, the mean change on average in CMT across all eyes was a 156.42µm reduction.

Table 7*: Change in CMT on follow-up OCT*

Eyes (on OCT)	Total Number of Eyes	Mean Change in CMT
Deteriorating CMO	9	104.78µm increase
Improving CMO	48	205.40µm decrease
All Eyes (Total)	57	156.42µm decrease

Limitations

- Data collected from only one specialist eye hospital in Birmingham, UK.
- Some patients have received repeated courses of different forms of therapies and so it is difficult to interpret the results and determine which is the best approach of treatment to take.
- Another drawback includes the absence of evaluation of severity, duration and activity of uveitis as these all play a role in response to treatment
- The sample is somewhat limited in both size and diversity, thus a wider sample would be preferred to increase generalizability.

Conclusion

- IMMP is effective in treating CMO in non-infectious uveitis, having fewer side effects than other forms of systemic corticosteroid, being less invasive and with lower-risk of complications than peri-ocular or intra-ocular corticosteroids.
- it may be more effective as initial treatment owing to its reduced side effect profile, better compliance and that it can be administered easily by allied healthcare professionals.