



Unilateral Hypermature Cataract and Uveitis in Dwarf Campbell's Hamster (*Phodopus campbelli*)

Tuba Özge Yaşar

10.18805/ag.DF-399

ABSTRACT

Background: In the ophthalmological examination of a 1.5-year-old male dwarf Campbell hamster, who was examined with complaints of photophobia, pain, weakness and whitening of the eye color, hypermature cataract and chronic uveitis were observed in the left eye.

Methods: Local antibiotic therapy was administered to the patient for the first ten days in order to eliminate a possible microbial agent. In addition, local NSAID drugs were applied to reduce pain and inflammation. Then, peros Prednol (methylprednisolone) was administered at a dose of 0.5 mg/kg for the first ten days and 1 mg/kg for the next ten days in order to suppress the inflammation associated with uveitis. The patient's body weight and intraocular pressure were measured before the treatment. During the treatment, intraocular pressure values were checked every day. During this period, the patient was fed ad libitum at normal room temperature, in his own cage.

Result: As a result of the treatment applied to the patient, who was followed up for more than a month, symptoms such as pain, photophobia and blepharospasm disappeared and the patient's eating and drinking status improved compared to the past. However, increasing dose of Prednol did not have the expected effect on intraocular pressure values. Due to the very small size of the hamster eye in the treatment of hypermature cataracts, lens removal cannot be performed as easily as in other species.

Key words: Cataract, Hamster, Intraocular pressure, Prednol, Uveitis.

INTRODUCTION

Except for the rodents such as rabbit, rat, mouse and guinea pig, many mammal species are accepted and kept as pets. On the other hand, hamsters, gerbils, chinchillas and degus are accepted as pets. Campbell's dwarf hamsters were first introduced to W.C. in Mongolia in 1902 discovered by Campbell. Northern China, Central Asia and the south-eastern parts of Russia are their natural habitats (Anonymous 2021a). Although hybrids are of different colors, Campbell's dwarf hamsters can be gray, brown, or cream in color. On his back, a darker line running along his spinal cord draws attention. The feathers on the abdomen are lighter in color (Anonymous 2021a). The lifespan of Campbell's dwarf hamsters is 1.5-2 years. They have a body length of about 10 cm and is quite difficult to catch and hold. They are social creatures and get along especially well with other Campbell's dwarf hamsters of the same age and sex (Anonymous 2021b).

In preclinical research, hamsters are preferred by researchers because of the advantages they provide as animal models (Jin-xin *et al.*, 2020). However, the small size of hamster eyes limits ophthalmological examinations, tests and operative interventions in other mammals, sometimes even making it impossible.

Among the ocular diseases, there are several reports of conjunctivitis, keratoconjunctivitis sicca, eyelid melanoma, retinal dysplasia and Harder gland abscess seen in hamsters (Mangkoewidjojo and Kim., 1977; Schiavo., 1980; Williams, 2007; Zaffarano *et al.*, 2015). Cataracts are relatively common in hamsters, either only in the elderly or as part of a systemic syndrome in cardiomyopathic (Thakar *et al.*, 1977).

Department of Surgery, Faculty of Veterinary Medicine, Namık Kemal University, Tekirdağ, Turkey.

Corresponding Author: Tuba Özge Yaşar, Department of Surgery, Faculty of Veterinary Medicine, Namık Kemal University, Tekirdağ, Turkey. Email: dr.tozgeyasar@gmail.com

How to cite this article: Yaşar, T.Ö. (2022). Unilateral Hypermature Cataract and Uveitis in Dwarf Campbell's Hamster (*Phodopus campbelli*). *Agricultural Science Digest*. 42(1): 114-117. DOI: 10.18805/ag.DF-399.

Submitted: 27-08-2021 **Accepted:** 01-11-2021 **Online:** 06-12-2021

Uveitis is an ocular disease that is frequently encountered in clinics and causes blindness as a result of damage to the uveal canal (iris, corpus ciliaris, choroid) (Tian *et al.*, 2015). Although operative treatment of cataract can be performed in humans and other mammalian species, it carries risks and complications before or after the operation (Ahmad *et al.*, 2017).

Local or systemic cortisone is initially used in the treatment of autoimmune uveitis (Pacheco *et al.*, 2008). Glucocorticosteroids are used in ocular treatments effectively. Steroid preparation and method of administration can lead to significant differences in penetration and efficacy in experimental uveitis cases (Tsuji *et al.*, 1997; Behar-Cohen, 1997).

MATERIALS AND METHODS

A 1.5-year-old male dwarf Campbell's hamster was brought to Namık Kemal University Faculty of Veterinary Medicine Department of Surgery with complaints of photophobia, pain,

weakness and whitening of the eye color. The owner of the patient stated that the patient could not open her eyes for two months and did not receive any treatment before. There was no suspicion of trauma. It was also stated that the patient was kept in the same cage with another male dwarf Campbell's hamster and they got along well with each other. In the ophthalmological examination hypermature cataract and chronic uveitis were observed in the left eye. Besides, all these inflammatory reactions led to phthisis bulbi (Fig 1). Medical treatment was started by staying in the home environment where the patient was taken care of for his comfort. Drug administration, measurements and controls were performed in the patient's environment. Thus, during the treatment, which lasted for one month, the patient was prevented from being overly stressed.

In the ophthalmological examination, his right eye was healthy. Photophobia, blepharospasm and pain were detected in the left eye. Hypermature cataract and uveitis were also observed (Fig 2). Intraocular pressure values were measured with a Tonovet (Icare tonometer).

During the ultrasonographic examination (WED-9618V, Weeld) hyperechoic area compatible with cataract was seen (Fig 3). Vigamox drops containing 0.5% Moxifloxacin Hydrochloride (Novartis, Alcon Laboratories, Texas / USA) and Ciloxan pomade containing 0.3% Ciprofloxacin (Novartis, Alcon Laboratories, Texas / USA) were applied to the patient for the first ten days to eliminate the possible presence of any microbial agents. In addition, Nevanac (Novartis, Alcon Laboratories, Texas/USA) drops containing 0.1% Nepafenac were applied as a pain reliever and anti-inflammatory. During this ten-day period, the intraocular pressures of both eyes were measured regularly. Meanwhile, the intraocular pressure values of both eyes of the other healthy hamster were measured for eight days to obtain up-to-date data on normal intraocular pressure values of dwarf Campbell hamsters.

After 10 days of local treatment, the patient with a bodyweight of 69.7 g was administered Prednol (Mustafa Nevzat İlaç, containing 16 mg methylprednisolone tablets) by gavage, mixed with drinking water at a dose of 0.5 mg/kg, because the clinical findings of photophobia, pain and blepharospasm due to uveitis could not be achieved in the patient at the desired level. Sanayii, Istanbul/Turkey) was applied for 10 days. Meanwhile, a hyphema formed in the patient's left eye (Fig 4). Sikloplejin (Abdi İbrahim İlaç Sanayi ve Ticaret A.Ş., Istanbul/Turkey) containing 1% Cyclopentolate and Nevanac drops were applied to the patient alternately. A dose of 1 mg/kg Prednol was administered for the next 10 days and intraocular pressure values were measured.

RESULTS AND DISCUSSION

Pre-treatment intraocular pressure values of the sick hamster were 14 mm/Hg for the right eye (OD) and 8 mm/Hg for the left eye (OS). The values obtained on the average of the measurements made during eight days in



Fig 1: Phthisis bulbi on the left eye.



Fig 2: Pre-treatment view.

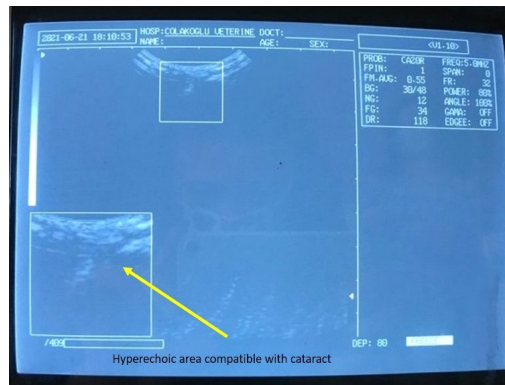


Fig 3: USG examination.



Fig 4: Hyphema formed in the anterior chamber.

healthy hamsters were OD 11.5 mm/Hg and OS 9.125 mm/Hg (Table 1).

The mean intraocular pressure during the local drug administration was determined as 10.2 mm/Hg for the right eye and 8.8 mm/Hg for the left eye (Table 2). After administration 0.5mg/kg Prednol treatment for ten-day period, intraocular pressures were determined as 10.6 mm/Hg OD and 7.6 mm/Hg OS (Table 3). It was understood that the intraocular pressure in the left eye did not reach normal values yet. When the dose of Prednol increased to 1 mg/kg the mean values were determined as OD 9.3 mm/Hg and OS 6.5 mm/Hg (Table 4).

Although normal values could not be reached in the intraocular pressure values, photophobia and blepharospasm did not occur. As an indicator of this, the patient's pain was significantly reduced and feeding and drinking behaviors were normalized. It was understood that inflammatory reactions due to chronic uveitis were suppressed and controlled. Lens removal cannot be performed as easily as in other species due to the very small size of the hamster eye in the treatment of hypermature cataracts.

In veterinary ophthalmology, cataracts and uveitis have an important place in addition to other eye diseases. A positive response is obtained when it is detected in time and the correct treatment protocol is applied. However, as the disease becomes chronic, the damage it causes to the tissue or organism can cause irreversible damage. In the present study, the existence of the disease for about two months and since no treatment was applied, it responded difficult to the treatment protocol we performed.

The clinical effects and pathological changes of synthetic oligodeoxynucleotide (ODN), prednol (PRD) and azathioprine (AZA) were compared in the treatment of experimentally induced uveitis in rats in a study (Yaşar Erkal *et al.*, 2019). According to the results, the mean value of right and left eye IOP showed that the immunosuppressive effect of Prednol was higher than the others. In the current study, even in Prednol application, which is frequently preferred in the treatment of uveitis and has an immunosuppressive effect and could not provide a change in intraocular pressure close to normal intraocular pressure values (Fig 5). This made us think that the ciliary body, which is responsible for the production of the humor aqueous, was irreversibly affected by the inflammatory reaction due to uveitis. There is not enough information in the literature about normal intraocular pressure values of dwarf Campbell's hamsters. In this study, it is thought that the data obtained by measuring the intraocular pressure values of healthy and sick hamsters will contribute to the literature. In addition, dwarf hamsters were very difficult to handle because of their small size and being very active. Unlike other mammalian species, hamsters have been found to be under a lot of stress during their manipulation. If their buccal sacs are full when held by hand, they eject the baits in the pouch

Table 1: Intraocular pressure values in healthy hamsters.

Days	OD (mm/Hg)	OS (mm/Hg)
1	11	8
2	15	10
3	9	7
4	10	8
5	13	12
6	10	8
7	11	11
8	13	9
Average values	11.5	9.125

Table 2: Daily intraocular pressure values during local treatment.

Days	OD(mm/Hg)	OS (mm/Hg)
1	14	8
2	11	9
3	8	8
4	10	8
5	10	12
6	10	9
7	10	10
8	8	8
9	8	8
10	13	8
Average values	10.2	8.8

Table 3: IOP under treatment 0.5mg/kg prednol.

Days	OD (mm/Hg)	OS (mm/Hg)
1	13	7
2	10	7
3	9	8
4	10	6
5	8	8
6	12	10
7	12	7
8	10	10
9	11	7
10	11	6
Average values	10.6	7.6

Table 4: IOP under treatment 1 mg/kg prednol.

Days	OD (mm/Hg)	OS (mm/Hg)
1	11	8
2	14	10
3	7	5
4	8	7
5	11	6
6	9	5
7	9	6
8	8	6
9	8	6
10	8	6
Average values	9.3	6.5

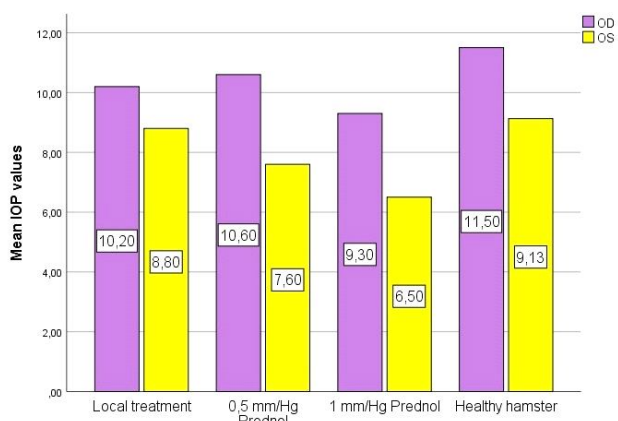


Fig 5: Mean IOP values for local treatment, prednol administration and in the healthy hamster.

due to the stress. In the meantime, it was experienced that it is more appropriate not to insist on the examination or measurement and not to force the animal. Instead leaving it alone for a while and performing the re-examination procedure after waiting for it to calm down will be better.

CONCLUSION

Cataract and uveitis in the dwarf Campbell's hamster were examined and treated in the current study. Intraocular pressure values for healthy and unhealthy hamsters were presented which is expected to play as reference values for the further studies. Administration of Prednol did not provide any dramatic change in the intraocular pressure values. In addition, the phacoemulsification technique, which is now routinely used in cataract treatment and veterinary ophthalmology couldn't be applied to the dwarf hamsters. Arrangement of a phaco probe suitable for small-eyed animals may allow such operations to be performed. In the light of technological developments, there is no doubt that this deficiency will be eliminated with the new medical devices to be developed in the future.

ACKNOWLEDGEMENT

I sincerely acknowledge the Vetpati Veterinary Clinic, Tekirdağ, Turkey for their support in providing the ultrasound examination process.

REFERENCES

- Ahmad, R., Saini, N.S., Mahajan, S.K., Mohindroo, J., Singh, S.S. (2017). Comparison of rigid polymethylmethacrylate and foldable square edge acrylic lens replacement for management of cataract after phacoemulsification in 22 eyes of dogs. *Indian Journal of Animal Research*. 51: 146-150.
- Anonymous (2021a). Campbell's dwarf hamster (Last accessed on 20 August 2021) https://en.wikipedia.org/wiki/Campbell%27s_dwarf_hamster.
- Anonymous (2021b). Different types of hamsters: The ultimate guide (Last accessed on 20 August 2021) <https://www.myfamilyvets.co.uk/different-types-of-hamsters#3>.
- Behar-Cohen, F.F., Parel J.M., Pouliquen, Y. (1997). Iontophoresis of dexamethasone in the treatment of endotoxin-induced uveitis in rats. *Experimental Eye Research*. 65: 533-45.
- Jin-xin M., Jian-yao W., Robl, N., Hao-ran G., Shao-he S., Peng, Y., Ya-chao W., Sheng-nan H., Xiu-min L. (2020). Validation of stable housekeeping genes for quantitative real time PCR in Golden Syrian Hamster. *Indian Journal of Animal Research*. DOI: 10.18805/IJAR.B-1237.
- Mangkoewidjojo, S. and Kim, J.C. (1977). Malignant melanoma metastatic to the lung in a pet hamster. *Laboratory Animals*. 11(2): 125-127.
- Pacheco, P.A., Taylor, S.R., Cuchacovich, M.T., Diaz, G.V. (2008). Azathioprine in the management of autoimmune uveitis. *Ocular Immunology and Inflammation*. 16: 161-165.
- Schiavo, D.M. (1980). Multifocal retinal dysplasia in the Syrian hamster LAK: LVG (SYR). *Journal of Environmental Pathology and Toxicology*. 3(5-6): 569-576.
- Thakar, J.H., Percy, D.H., Strickland, K.P. (1977). Ocular abnormalities in the myopathic hamster (UM- X7.1 strain). *Invest Ophthalmol Vis Sci*. 16: 1047-1052.
- Tian, Q., Bi, H., Cui, Y., Wu, J., Xie, X., Guo, J., Guo, D., Qian, J., (2015). Influence of yanyankang powder on Th1/Th2 in rats with experimental autoimmune uveitis. *Chinese Journal of Integrative Medicine*. 22: 214-218.
- Tsuji, F., Sawa, K., Kato, M., Mibu, H., Shirasawa, E. (1997). The effect of betamethasone derivatives on endotoxin-induced uveitis in rats. *Experimental Eye Research*. 64: 31-6.
- Williams, D. (2007). Rabbit and rodent ophthalmology. *European Journal of Companion Animal Practice*. 17(3): 242-252.
- Yaşar Erkal, T.Ö., Kılıç, S., Hatipoğlu, F., Terzi, F. (2019). Comparison of the clinical effects of Prednisolone, Azathioprine and Oligodeoxynucleotide (ODN) applications in experimentally induced endotoxin uveitis in rats. *Indian Journal of Animal Research*. 53(6): 827-831.
- Zaffarano, B.A., Allbaugh, R.A. and Whitley, E.M. (2015). Bilateral harderian gland abscesses in a Syrian dwarf hamster (*Mesocricetus auratus*), *Journal of Exotic Pet Medicine*. 24(2): 209-214.