UVEITIS ANTERIOR IN A CAMEL – THE CLINICAL CASE

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Abstract

Characteristics, diagnostics, clinical signs and therapy course of uveitis in circus camel were described. Moderate uveitis anterior of traumatic origin in the camel is a real proof of possible uveitis occurrence in other species than cats, dogs, and horses in which the disease was most often observed.

Key words: camel, uveitis, therapy.

Uveal tract inflammation (uveitis), concerning the anterior (uveitis anterior) and posterior (uveitis posterior) segments of the choroid with potential intermediate occurrence is a serious painful disease of the inner eyeball. This may lead to serious complications including loss of sight in both humans and animals (1, 6, 9, 11, 16).

Uveal tract nourishes the non-vascularized elements of eyeball: cornea, lens, vitreous humour, serving as the defense mechanism of interior part of the eye as well. The endothelial cells of the uvea containing immunocompetitive cells are very sensitive to local and general homeostatic disorders. In case of any eyeball threats the uvea responds with inflammatory reaction of various intensity and extensity reflecting the defense mechanisms (4, 12, 14). Complications like frontal and rear synechiae, dislocation of the lens, cataract, glaucoma, vitreal inflammation, and retinal detachment can be seen in the course of this inflammatory process. The majority of the mentioned complications may produce profound and irreversible loss of vision (1, 2, 6, 11, 16, 14).

Uveitis is characterized by exceptionally wide heterogeneity, regarding both etiology and symptoms. Injuries, local infections, general infectious diseases, tumours as well as immunological diseases are considered to be the causative factors. However, in many cases, even up to 70% of them, identification of primary cause is difficult or even impossible to achieve, then in such cases uveitis is defined as idiopathological. The course of the disease is associated with various symptoms. Most of them originate from inflammatory area and are related to the size and location of the inflammation. The pain of the whole eyeball as well as general symptoms are present during the disease. Alteration in the eyelids, conjunctivas, cornea, anterior chamber, on the iris surface, and fundus can be revealed by ophthalmic investigation. The course of the disease may be acute or chronic. In acute conditions the symptoms are reversible, while the chronic may lead to irreversible complications (1, 6, 7, 11, 14, 16, 17).

The aim of this work was to characterize and analyse the clinical case of anterior uveitis in a camel. No publications have been found so far describing the disease in this animal species.

Case description. The described animal was Asiatic, circus bactrian camel (Camelus bactrianus), male, age 1 year and 10 months of age, weighing approximately 300 kg (Fig.1). The reason of concern was the fact of growing sadness in the animal, anorexia and alteration in the right eyeball remaining for 2 d. Apathy, conjunctival redness, no alteration in lymphatic nodes, body temperature of 38.7°C, heart rate of 60/min, and the respiratory rate of 20/min were noted during the first clinical examination. Further detailed examination revealed painful, warm swelling of the right cheek and nasal area. Painful swallowing was also noted. No other systemic signs were observed. The ophthalmic examination revealed alteration in the right eyeball and its surrounding structures: photophobia, blepharoedema, conjunctival congestion, epiphora. The Schrimer test results of the conjunctival sac were: right - 25 mm, left - 16 mm. Diffused corneal oedema and paralimbal neovascularization (Figs 2 and 3) was revealed by ophthalmoscopic examination. Due to corneal oedema, the anterior chamber, iris, and remaining intraocular structures were not accessible for the observation. The fluorescein and rose Bengal tests were negative. The intraocular pressure measured with Schiotz tonometer using 7.5 g weight was 11 mmHg for the right eyeball, and 15 mmHg for the left one.

Blood was collected from the jugular vein to perform biochemical and haematological examinations. The activity of AST, ALT, and AP, and concentrations of urea, bilirubin, and glucose were determined in the serum.
Fig. 1. Asiatic, camel Bactrian, male aged 1 year and 10 months. Left side of the head.

Fig. 2. Right side of the head. Oedema of the eyelids, oedema and congestion of conjunctiva.

Fig. 3. Right eyeball. Diffused corneal oedema and paralimbal neovascularization.
After clinical examination, *uveitis anterior* of the right eyeball and swelling of the nasal area (*oedema cutis regio nasalis*) was initially diagnosed. Probably the inflammation was caused by mechanical trauma.

The early treatment began on the first day with topical atropine drops combined with phenylephrine and dexamethasone, every 6 h with 15 min intervals between the preparations. Tolfenamic acid was administered generally in subcutaneous injections in a dose of 4 mg/kg/48 h. Compresses containing prednisolone and DMSO were used on swollen skin in the nasal-chick area. During the whole treatment period, the animal was isolated from the rest of the animals.

The following day the laboratory and clinical examinations were made. Values of the biochemical tests were within physiological limits. The general state of the animal was good, and the temperature, and heart breath rates were physiological. Detailed examination revealed reduction in swelling on the nasal-chick area. Further, reduced blepharoedema and conjunctivitis as well as a decrease in swelling of distinct corneal part was affirmed by ophthalmic examination. The transparency of the cornea was sufficient to perform a fundoscopic examination of front chamber and remaining intraocular structures. This examination revealed appearance of haemorrhages (*hyphaema*) in the lower part of the anterior chamber. Iris was imperceptibly swelled and held in extended position. The lens, vitreous humour, and eye-grounds revealed no alterations. The results of follow-up examinations combined with the results of laboratory findings confirmed preliminary recognition. Intensification of ocular alterations was estimated as moderate, and the prognosis as careful.

The initial topical treatment was modified the next day according to the widening of the iris. Phenylephrine was withdrawn and atropine was used only once daily. Other treatment remained unchanged.

During the third day, a general state of the animal was good. There was a recovery from anorectic state, swallowing exhibited no pain. Facial swelling was no longer present. Also swelling in the central corneal part was strongly reduced. The iris remained widened. The settled local and general treatment was continued. The usage of nose and cheek compresses was no longer required, and therefore discontinued.

After a week treatment animal state was satisfactory. There was no alteration in the clinical examination. Ophthalmic examination revealed withdrawal of the conjunctival and eyelid inflammatory changes as well as the corneal swelling. There was some haemorrhagic liquid left on the bottom part of the anterior chamber. The further treatment consisted of topical use of dexamethasone combined with neomycin and polymyxin B for 5 next weeks.

According to the migrant character of the circus work, control examination in the place was not possible. However, the telephone reports confirmed that the animal recovered completely after the treatment.

**Discussion**

The inflammatory reaction in the uvea has the same morphological and biochemical course as in any other part of the organism. The same defensive cells and chemical mediators are present in its formation.

The infiltration consists of neutrophils, eosinophils and multiplying reticulocytes. Reticulocytes can differentiate to monocytes, histiocytes and lymphocyte-like cells, depending on the inflammatory reaction cause. Granulocytes are predominating in the first stage of inflammatory reaction but after 48–72 h the predominant role is taken by the mastocytes and monocytes which clean up damaged tissues (1, 14).

Complement, kinines, leukotriens and prostaglandins released from the infiltrating cells are chemical mediators acting locally in the inflammation site. Arachidonic acid is one of the mediators originating from membranous phospholipids. Its transformation can proceed in two different ways. The first path, dependent on the lipoxygenase leads to the formation of hydroperoxyeicosatetraenoic acid and leukotriens. Secondary cyclooxygenase route leads to the formation of prostaglandins PGF2, and PGF2a, prostacyclines and tromboxane. These mediators act in the development of the inflammation of the uvea, particularly in its anterior part (3, 6, 10, 14).

Prostaglandins cause vasodilatation and enhance permeability of the capillaries. The uvea vasodilatation is most visible on the conjunctiva and sclera as distinct redness. Paralimbar neovascularization can also occur as red-eye syndrome. Extended capillaries can be also present on light coloured iris. Enhanced permeability of the capillaries leads to alteration in the blood-vitreous humour barrier and inflammatory exudates in the anterior chamber containing albumins, globulins, fibrinogen or even blood cells. Prostaglandins are responsible for the occurrence of pain, iris contraction, and decrease in intraocular pressure. Strong contraction of ciliary muscles is responsible for pain reaction. Lowered ocular pressure is a consequence of decrease in humour production by inflamed ciliary epithelium and hypotonic influence of prostaglandins as acceleration of aqueous humour flow to filtration angle (1, 10, 14, 18).

Most of the clinical signs typical of the classic uveitis were present in this case: deep capillaries (phenylephrine test), high value of Schrimer test, decrease in intraocular pressure, corneal swelling and anterior chamber exudates. Inflammatory reaction was restrained to the anterior part of the uvea, which was confirmed by correct position and appearance of the lens, vitreous humour, and fundus.

In differential diagnostics of uveitis other diseases with red-eye symptoms like conjunctivitis, keratitis, scleritis, keratoconjunctivitis sicca, and glaucoma should be considered. The same ophthalmology principles were accepted in differential diagnosis of the described case (5, 9, 11, 14, 16).

To establish the cause of the disease medical history, clinical examination, and laboratory blood tests considered all together are required (1, 2, 12, 14, 16).
case of the described camel, the owners adverted to possibility of head trauma in regard to animal considerable aggressiveness. The presence of swelling in right nasally cheek area confirmed suspected traumatic character of eye disease. Additionally, no metabolic or infectious diseases were affirmed by biochemical tests and haematology. All data obtained suggested traumatic origin of the disease. Injuries are considered as main cause of uveitis (2, 11, 12, 15) in farm animals (16) and humans (6). In the described case all information collected by examinations confirmed traumatic origin of the uveal tract inflammation.

Prognosis in case of uveitis must be prudent, resulting from several factors. The closer location to the uvea, the more optimistic is the prognosis. When the causes are better known and reversible, the treatment can be more effective and thus give less recurrence. Beginning of treatment and avoidance of complication is also important (1, 2, 12, 14). In this case, prognosis was cautious in the beginning, but after establishing the traumatic cause of the disease (and therefore reversible), prognosis changed to well even.

The treatment of the inflammation of the uvea is causal and symptomatical. In the causal treatment all methods are used to eliminate the causative disease factor. Symptomatical treatment complies the use of cycloplegic, antiphlogistic, steroid, non-steroid, and immunosuppressive drugs (1, 11, 12, 14, 16). In the described case the causal treatment started as soon as possible. Atropine and phenylephrine topical drops were used on the first day as the symptomatical treatment. The parasympatholytic activity of atropine paralyses the ciliary muscles, leading to the mydriasis and decrease in formation of the front chamber exudate and to ciliary pain release as well. The essential effect of the atropine administration is prevention of stenosed iris concrescences with anterior surface of the lens or posterior corneal surface. Phenylephrine supports effect of atropine and accelerates its mydriatic influence on ciliary body. After mydriasis was achieved, phenylephrine was withdrawn from the treatment and atropine was used alone to maintain analgesic and mydriatic effect and to prevent iris blocking and contraction of filtration angle. Antiphlogistic steroid drugs were also applied locally. Dexamethasone was chosen because of its good antiphlogistic effect. This drug exerts an antiphlogistic effect by influence on phospholipase A2, preventing release of arachidonic acid from cellular membrane phospholipids. This action decreases appearance of symptoms by limiting congestion, exudates formation, and activity of inflammatory cells like neutrophils, eosinophils, T-lymphocytes, and fibroblasts. In the treatment of uveitis a precise dosage and frequency of glucocorticoid administration, matching the intensity of clinical changes, should be used. Changes appearing in the described animal were estimated as moderate. On that principle the dexamethasone frequency was established for 4 times daily for one week, followed by dosage matching recessing signs, 3 times daily for 5 weeks. Extended application of glucocorticoids, even up to 6-8 weeks is recommended because of the possibility of acute recurrences of the disease (1, 11, 14, 16).

Beside the local treatment, non-steroid anti-inflammatory drugs were administered. These drugs have growing importance in veterinary ophthalmology, because more substances from this group are available (8). Among these drugs, tolfenamic acid was chosen for the treatment because of its combined analgesic and anti-inflammatory effect. It decreases prostaglandin synthesis by inhibiting arachidonic acid cascade and blocking tissue prostaglandin receptors (8, 13).

Reassuring, the described traumatic vascular membrane inflammation was moderate. The animal species described is very rare type of veterinary patients in Poland and the fact of recovery on adopted treatment is positive. The lack of similar cases described in the literature emphasizes importance of the observations. Moreover, the case proves real possibility of uveitis occurrence in other animal species than dogs, cats and horses. Differential diagnosis of eye disease should consider “red eye” symptoms occurring in different species.

References

