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Uveitis in a camel – a clinical case

Zapalenie błony naczyniowej u wielbłąda – przypadek kliniczny

SUMMARY

Inflammation of the uveal tract (*uveitis anterior or posterior*) is an serious disease of the eye, leading in many causes to blindness. The article presents a clinical case of *uveitis* in a circus camel. Characteristics of the disease, diagnostics, clinical signs and therapy course are described in the article. Moderate *uveitis anterior* in a camel of traumatic origin is a real proof of possible *uveitis* occurrence in breeds different from cats, dogs and horses as most often described.

Key words: camel, *uveitis*

INTRODUCTION

Uveal tract inflammation (*uveitis*), concerning the anterior (*uveitis anterior*) and posterior segment of choroid (*uveitis posterior*) with potential intermediate occurrence, is an serious painful disease of the inner eyeball. This can lead to serious complications including loss of sight in both human and animals [Kapuściński 1986, Slatter 1990, Petersen-Jones and Crispin 1993, Clerc 1997, Madany 2000].

Uveal tract nourishes the nonvascularised elements of the eyeball: cornea, lens, vitreous humor serving as the defense mechanism of the interior part of the eye as well. The endothelial cells of vascular membrane containing immunocompetitive cells are very sensitive to local and general homeostatic disorders. In case of any eyeball threats vascular membrane respond with inflammatory reaction of variety intensity and extensity reflecting the defense mechanisms [Furowicz 1991, Renvick 1995, Roze 1997]. Complications like frontal and rear synechiae, dislocation of the lens, cataract, glaucoma, vitritis and retinal detachment can be seen in the course of this inflammatory process. The majority of the mentioned complications may produce a profound and irreversible loss of vision [Kapuściński 1986, Crispin 1988, Slatter 1990, Clerc 1997, Petersen-Jones and Crispin 1993, Roze 1997].

Uveitis is characterized by exceptionally wide heterogeneity, regarding etiology and symptoms as well. Injuries, local infections, general infectious diseases, tumors as well as immunological diseases are considered to be the causative factors. However, in many cases, even up to 70%, identification of the 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 the inflammatory area and are related to the size and location of the inflammation. 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 the fundus can be revealed by oculistic investigation. The course of the disease may be severe or chronic. In acute conditions the symptoms are reversible, while chronic disease can lead to irreversible complications [Slatter 1990, Clerc 1997, Roze 1997, Trbolova *et al.* 2003, Kielbowicz 2004].

The aim of the presentation was to characterize and analyze 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, bactrian circus camel (*Camelus bactrianus*), male, age 1 year and 10 months, weight approximately 300 kg (Phot. 1). The reason for concern was the fact of growing sadness in the animal, anorexia and alteration in the right eyeball remaining for 2 days.



Phot. 1. Asiatic camel bactrian, male, 1 year and 10 months. Left side of the head
Fot. 1. Wielbłąd azjatycki. Wiek 1 rok i 10 miesięcy. Lewa strona głowy

Apathy, redness, no alteration in lymphatic nodes, body temperature at 38,7° heart rate 60/min. resp. rate 20/min were observed during the first clinical examination. A 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. A systematic ocular examination revealed alteration in the right eyeball and its surrounding structures: photophobia, edema of the eyelids, conjunctival congestion, epiphora (Phot. 2). The Schirmer test results of the right conjunctival sac – 25 mm, left – 16 mm. Diffused corneal edema and paralimbar neovascularisation was revealed by ophthalmoscopic examination (Phot. 3). Due to the corneal edema, anterior chamber, iris and resting intraocular structures were not accessible for the observation. Fenylefrine using ex-

amination revealed the presence of large blood vessels in the conjunctival congestion. The Fluoresceine and Bengal reddened test was negative. The intraocular pressure of the right eyeball measured with Schiötz tonometer using 7.5 g weight was 11 mm Hg, and 15 mm Hg for the left eyeball. Blood was collected from the jugular vein for biochemical and haemological examination. The biochemical serum examination considered the activity of AST, ALT, AP, and the concentration of urea, bilirubine, and glucose. After clinical examination the initial diagnosis of *anterior uveitis* of the right eyeball and swelling of the nasal area (*oedema cutis regio nasalis*) was stated, probably caused by mechanical trauma.

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



Phot. 2. Right side of the head – edema of the eyelids, edema and conjunctival congestion
Fot. 2. Prawa strona głowy – obrzęk i przekrwienie spojówki



Phot. 3. Right eyeball – diffused corneal edema and paralimbar neovascularisation
Fot. 3. Prawa gałka oczna – rozlany obrzęk rogówki i unaczynienie obwódki

The following day's examination was made considering the laboratory results. Values of the biochemical tests were within physiological limits. The general state of the animal was good, and the parameters of temperature, heart rate and breath were physiological. A detailed examination revealed reduction in the swelling on the nasal-chick area. Further, reduced blepharedema and conjunctivitis as well as the decrease in the swelling of district corneal part was affirmed by oculistic investigation. The transparency of the cornea was sufficient to perform a fundoscopic examination of the front chamber and remaining intraocular structures. This examination revealed the appearance of hemorrhages (*hyphema*) in the lower part of the anterior chamber. The iris was imperceptibly swollen and held in extended position. The lens, vitreous humor and eye-ground revealed no alterations. The results of follow-up examination combined with the results of laboratory findings confirmed the preliminary recognition. Intensification of ocular alterations was estimated as average, and the prognosis as careful.

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

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

After a week's treatment the animal's state was satisfactory. There was no alteration in the clinical examination. Oculistic examination revealed withdrawal of the conjunctival and eyelid inflammatory changes as well as the corneal swelling. There was some hemorrhagic liquid left in the bottom part of the anterior chamber. A further treatment consisted of topic use of dexamethasone combined with neomycine and polimyxine B t.i.d. for 5 next weeks.

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

DISCUSSION

The inflammatory reaction in vascular membrane 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 neutrophiles, acidophiles 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 clemastocytes and monocytes are cleaning up the damaged tissues and phagocytes [Clerc 1997, Roze 1997].

Complement, chinines, leucotriens and prostaglandins relived 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 depends on the lipooxygenase leads to hydroperoxieikosotetraenoic acid (HPETE) and leukotriens. The second cyklooxygenasic route leads to prostaglandins PGF₂, PGF_{2a}, prostacyklines and tromboxane creation. These mediators act in the development of the inflammation of vascular membrane, particularly in its anterior part [Kapuściński 1986, Dziezyc and Milichamp 1989, Milichamp and Dziezyc 1991, Roze 1997].

Prostaglandins cause vasodilatation and enhance permeability of the capillaries. The vascular membrane vasodilatation is most visible on the conjunctiva and sclera as distinct redness, paralimbar neovascularisation can also occur as red-eye syndrome. Extended capillaries can also be present on the light colored iris. Enhanced permeability of the capillaries leads to alteration in the blood-vitreous humor 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 of intraocular pressure. Strong contraction of ciliary muscles is responsible for pain

reaction. Lowered ocular pressure is a consequence of decrease in humor production by inflamed ciliary epithelium and hypotonic influence of prostaglandins as acceleration of aqueous humor flow to drainage angle [Wilkie 1989, Milichamp and Dziezyc 1991, Roze 1997].

Most of the clinical signs typical of the classic *uveitis* were present in this case: the presence of deep capillaries (fenylefrine test), high value of Schirmer test, decrease of intraocular pressure, corneal swelling and anterior chamber exudates. Inflammatory reaction was restrained to the anterior part of the vascular membrane, which was confirmed by the correct position and appearance of the lens, vitreous humor 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 [Slatter 1990, Roze 1997, Garncarz 2004].

To establish the cause of the disease requires history, clinical examination and laboratory blood tests considered all together. In case of the described camel, the owners adverted to the possibility of head trauma during the animals' considerable aggressiveness. The presence of the swelling in a right nasal cheek area confirmed the suspected traumatic character of eye disease. Additionally, no metabolic or infectious diseases were affirmed by biochemical tests and hematology. All data received suggested traumatic origin of the disease. Injuries are considered as the main cause of the uveitis [Petersen-Jones and Crispin 1993, Renvick 1995, Roze 1995] in farm animals [Slatter 1990] and human [Kapuściński 1986]. In the described case all information collected by examinations confirmed the traumatic origin of the uveal tract inflammation.

Prognosis in case of *uveitis* must be prudent, resulting from several factors. The closer location to the vascular membrane, 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. The beginning of treatment and avoidance of complication is also important. In this case of the *uveitis anterior*, prognosis was cautious in the beginning, but after establishing the traumatic cause of the disease (and therefore and reversible), prognosis changed to well even.

The treatment of inflammation of the vascular membrane is causal and symptomatic. In the causal treatment all methods are used to eliminate the causative disease factor. Symptomatic treatment complies the use of: cicloplegic, antiphlogistic, steroid, non-steroid, and immunosuppressive drugs [Slatter 1990, Renvick 1995, Clerc 1997, Roze 1997]. In the described case the causal treatment was begun, the camel was separated from the herd. Atropine and phenylephrine topic drops were used 4 times on the first day as the symptomatic treatment. The parasympathetic act of atropine paralyses the ciliary muscles leading to mydriasis and decreasing the formation of the front chamber exudate and ciliary pain release as well. The essential effect of atropine administration is the prevention of stenosed iris concrescences with the anterior surface of the lens or posterior corneal surface. Phenylephrine supports the effect of atropine and accelerates its mydriatic influence on ciliary body. After mydriasis was assessed, phenylephrine was withdrawn from the treatment and atropine was used alone once a day for one week period to maintain analgesic and mydriatic effect to prevent iris blocking and contraction of the filtration angle. Antiphlogistic steroid drugs were also applied locally. Dexamethasone drops applied 4 times daily were chosen considering their good antiphlogistic effect. This drug exerts an antiphlogistic effect influencing phospholipase A2, preventing release of

arachidonic acid from cellular membrane phospholipids. This action decreases the appearance of symptoms by limiting congestion, exudates formation and the activity of inflammatory cells like: neutrophils, acidophiles, T-lymphocytes and the fibroblasts. The treatment of *uveitis* should use precise dosage of glucocorticoids matching the intensity of clinical changes, making the regulation of the used frequency from 1 to 12 times daily possible. Changes appearing in the described animal were estimated as average and dexamethasone frequency was established 4 times daily for one week, followed by a dosage matching the recurrent signs, 3 times daily for 5 weeks. Extended use of glucocorticoids, even up to 6–8 weeks is recommended according to the possibility of acute recurrences of the disease.

Besides the local treatment general administration of non steroids anti-inflammatory drugs was ordained. These drugs have a growing importance in veterinary ophthalmics, because more substances from this group are available [Kowalski and Pomorska 2004]. Among all NSAD, tolfenamic acid was chosen for 8 days' treatment of the camel because of combined analgesic and anti-inflammatory effect of this drug. It decreases prostaglandins synthesis by inhibiting arachidonic acid cascade and blocking tissue prostaglandin receptors [Roze *et al.* 1996, Kowalski i Pomorska 2004].

Summing up, the described traumatic vascular membrane inflammation was moderate. The animal species described is a very rare type of veterinary patient in Poland and the fact of recovery on adopted treatment is positive. Lack of similar cases described in the literature emphasizes the importance of the observations. Moreover, the case proves a real possibility of *uveitis* occurrence in different animals' species than dogs, cats and horses only. Differential diagnostics of eye diseases should allow „red eye” symptoms present in different species.

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STRESZCZENIE

Zapalenie błony naczyniowej oka (*uveitis*) jest poważną chorobą wnętrza gałki ocznej, która może doprowadzić do wielu powikłań z utratą wzroku włącznie. Celem pracy jest prezentacja klinicznego przypadku zapalenia błony naczyniowej gałki ocznej u wielbłąda cyrkowego, u którego rozpoznano *uveitis anterior* średniego stopnia spowodowane urazem. Na tle zaprezentowanego przypadku przedstawiono aktualną wiedzę na temat przyczyn, patogenezы, sposobu rozpoznawania oraz leczenia tej choroby. Przedstawiony przypadek świadczy o realnej możliwości występowania *uveitis* u innych gatunków niż psy, koty i konie, u których opisywany jest najczęściej.

Słowa kluczowe: wielbłąd, zapalenie błony naczyniowej