

SUCCESSFUL TREATMENT OF A STREPTOCOCCUS MENINGOENCEPHALITIS IN A BLACK RHINOCEROS (*DICEROS BICORNIS MICHAELI*)

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Bacterial infections of the central nervous system (CNS) occur in many species and are a serious health problem. The mortality rate associated with these CNS infections is very high in domestic species, and many animals that recover are left with permanent neurological sequelae (e.g., circling, ataxia, blindness, head tilt, proprioceptive deficits, cranial nerve palsies, seizures) (MESSER et al., 2008; NEWTON, 1998).

Much of the mortality associated with these diseases arises from the difficulty in diagnosing bacterial CNS infections. Antemortem diagnosis has been based on culture or cytology that demonstrates bacteria within the cerebrospinal fluid (CSF) (OVERTURF, 2005). Bacterial cultures appear to be fairly sensitive in people, with an estimated 71 % to 95 % positive cultures in cases of bacterial meningoencephalitis (DAWSON et al., 1999; SIGURDARDOTTIR et al., 1997). Direct visualisation of bacteria on cytological examination of CSF is rare (DAWSON et al., 1999). Because of rhinoceroses' large size, CSF has been only collected in juveniles until now. However, in several of the cases of encephalomalacia in black rhinoceroses calves it has been collected from lumbar or cisternal taps. No normal values have been reported, but values from domestic horses should provide a valid comparison (MILLER, 2003). The current case describes the first occurrence of the successful treatment of bacterial encephalitis in an adult black rhinoceros diagnosed by CSF collection. A very tame, 28-year-old male black rhinoceros (*Diceros bicornis michaeli*) showed sudden attacks of insecurity, aggressiveness and shouting. The animal was not responding to initial treatment of analgesics (10 g metamizolum natrium im, Vetalgin[®] N ad us. vet., Veterinaria AG, Zürich, Switzerland) and long acting neuroleptics (150 mg zuclopenthixiol im, Clopixon[®], Lundbeck AG, Opfikon.; 250 mg perphenazine im, Decentan[®] Depot, Merck Serono, Geneva, Switzerland). Therefore, the animal was immobilised with 5.6 mg etorphine (Immobilon, Novartis Animal Health, Dundee, U.K.), 10 mg detomidine (Domosedan[®] ad us. vet., Pfizer AG, Zürich, Switzerland) and 6 mg butorphanole (Alvegesic 1 % forte ad us. vet., Virbac AG, Glattbrugg, Switzerland) intramuscularly. During general examination a superficial wound around the horn base was present. Haematology revealed a moderate leucocytosis with neutrophilia. Blood chemistry results were within reference ranges (ISIS, 1999) except for globulines, AST and CPK. Serology for rabies and West-Nile Virus was negative. Equine Herpes Virus 1 and 4 was 1:14 and thus within normal limits established for horses. Radiographic examination of the skull revealed normal teeth and no fractured bones. Cerebrospinal fluid was taken by atlanto-occipital puncture. CNS fluid was moderately cloudy and of xanthochromic colour. In addition, 116 leucocytes (macrophages, neutrophiles and lymphocytes) / μ l CNS fluid were seen. Total protein level in CSF was highly increased. Gram positive bacteria were demonstrated within the CSF. Bacterial culture of the CSF revealed a moderate growth of streptococcus group D and the diagnosis of meningoencephalitis caused by streptococcus group D was formulated. Treatment was initiated with 10 g doxycycline po BID (Streuli AG, Uznach, Switzerland) and 75 g chloramphenicol (Streuli AG, Uznach, Switzerland) po

BID for almost four months. In addition 2,500 mg prednisolone (Prednisolon ad us. vet., Vétoquinol, Ittigen, Switzerland) were given po for 5 d initially, followed by 1,250 mg as a permanent treatment since then. Treatment progress was documented by several immobilisations including CNF examinations.

The current case demonstrated that antemortem diagnosis of meningoencephalitis in adult black rhinoceroses by CSF collection is possible. Nevertheless, disease recovery is slow with concomitant behavioural changes and accordingly requires intensive long-term veterinary care.

Acknowledgments

The authors thank M. Studer and all rhino keepers for their special care of our rhinoceros. The work and organisation of Ms. G. Hürlimann is gratefully appreciated.

References

- DAWSON KG, EMERSON JC, BURNS JL (1999): Fifteen years of experience with bacterial meningitis. *Pediatr Infect Dis J* **18**, 816 - 822.
- ISIS (1999): *Physiological data reference values*. Apple Valley, MN: International Species Information System.
- MESSER JS, WAGNER SO, BAUMWART RD, COLITZ, CM (2008): A case of canine streptococcal meningoencephalitis diagnosed using universal bacterial polymerase chain reaction assay. *J Am Anim Hosp Assoc* **44**, 205 - 209.
- MILLER ER (2003): *Rhinocerotidae (Rhinoceroses)*. In: FOWLER ME, MILLER ER (Eds.), *Zoo and Wild Animal Medicine*, St. Louis, Saunders Company, 558 - 569.
- NEWTON SA (1998): Suspected bacterial meningoencephalitis in two adult horses. *Vet Rec* **142**, 665 - 669.
- OVERTURF GD (2005): Defining bacterial meningitis and other infections of the central nervous system. *Pediatr Crit Care Med* **6**, 14 - 18.
- SIGURDARDOTTIR B, BJORNSSON OM, JONSDOTTIR KE, ERLENDSDOTTIR H, GUDMUNDSSON S (1997): Acute bacterial meningitis in adults. A 20-year overview. *Arch Intern Med* **157**, 425 - 430.