Narcolepsy is a neurological sleep disorder characterized by excessive daytime sleepiness, cataplexy (loss of muscle tone), sleep paralysis and hypnagogic hallucinations, also called the „tetrad of narcolepsy“. Although the pathogenesis is not completely understood, the disorder is well described in humans and it has been shown that a lack of the hormone hypocretin (orexin) synthesized in the hypothalamus is crucial. Narcolepsy with cataplectic attacks has also been reported in dogs, horses, cattle (STRAIN et al., 1984) and a lamb (WHITE und DE LA HUNTA, 2001).

In dogs up to 17 breeds have been shown to be affected sporadically, while familial forms occur in dobermans, labrador retrievers and dachshounds (TONOKURA et al., 2007). In horses there appear to be two syndromes (HINES, 2005), the first in which animals are affected within a few days after birth (possibly a familial form, reported in Suffolk, Shetland ponies, Fell ponies, Warmbloods, Miniature Horse foals (MAYHEW, 2011), Lipizzaner (LUDVIKOVA et al., 2012) and Icelandic horses (BATHEN‐NÖTHEN et al., 2009)) and the second in which animals are affected as adults (adult-onset narcolepsy).

It has been shown that both forms of canine narcolepsy are associated with a deficit in hypocretin/orexin neurotransmission (LIN et al., 1999). In the horse a similar etiology is suspected, but so far there are no studies to support this hypothesis.

The cataplectic attacks in humans and dogs occur during excitement or emotional stimulation such as laughing in humans or eating and playing in dogs. In contrast, the cataplectic or sleep attacks in adult horses happen almost exclusively while resting. The collapses observed in equines vary from drowsiness with hanging of the head, swaying, buckling at the knees or total collapse (see fig.1). Affected horses often show injuries and scars at the dorsal fetlocks, dorsal knees or at the face and the lips. ALEMAN et al. (2008) describe some of the suspected adult-onset narcolepsy cases as possible examples of sporadic idiopathic hypersomnia instead of true narcolepsy.

Since there are not many studies about adult-onset narcolepsy in horses, the authors set themselves the challenge to examine horses with supposed narcolepsy, evaluate associated husbandry conditions and to create sleep profiles by polysomnographic examinations of the subjects.

For this purpose a call to owners who’s horses were affected by narcolepsy in the German horse magazine Cavallo® was made, followed by the completion of a detailed online survey. 177 owners of horses with diagnosed narcolepsy completed the questionnaire. After a personal selection, 39 of these horses were visited. The horses were clinically examined and blood samples were taken. Video surveillance with infrared cameras and direct observation took place for a period of 24 hours and polysomnographic measurements were performed. Furthermore a closer look was taken at the stabling and management conditions and the medical history of the horses was documented.

So far the results of the study show that the affected horses suffer from up to more than 150
collapses a day. Collapses mainly took place
during the night (see fig.2) and most of the horses
refused to lie down during sleep time. Shortly
before the collapses many horses showed
typical REM (rapid eye movement) patterns in
the polysomnography.

In a previous study about the sleeping
behaviour of horses (KALUS, 2014), it has been
shown that REM-sleep occurs every night and
only while the equine is in a recumbent position,
which can be explained by the characteristically
decreased muscle tone during this sleep stage.

HINES, M. T. (2005). Narcolepsy: more common than
you think? Paper presented at the Proceedings of the North
American Veterinary Conference, Orlando, Florida.

des Schlafes beim Pferd auf der Basis polysomnographi-
scher Untersuchungen. Ludwigs-Maximilians-Universität
München.

LIN, L., FARACO, J., LI, R., KADOTANI, H., ROGERS, W.,
LIN, X., QIU, X., DE JONG, P. J., NISHINO, S., MIGNOT, E.
(1999): The sleep disorder canine narcolepsy is caused by a
mutation in the hypocretin (orexin) receptor 2 gene. Cell 98, 3,
365-376.

The authors presume that the „narcolepsy“
of most adult horses is not a neurological
disorder but a REM-sleep deficiency because of
recumbent sleep deprivation caused by illness,
ethological deficits or non animal-friendly
husbandry.

**Key words:** narcolepsy, cataplexy, polysomnography,
REM-sleep deficiency

Sleep and sleep disorders in horses. Paper presented
at the Proceedings of the 54th annual convention of the
AAEP, San Diego, USA.

BATHEN-NÖTHEN, A., HEIDER, C., FERNANDEZ, A.
J., BEINEKE, A., SEWELL, A. C., OTTO, M., TIPOLD, A.
(2009): Hypocretin measurement in an Icelandic foal with
narcolepsy. Journal of veterinary internal medicine 23, 6,
1299-1302.

LUDVIKOVA, E., NISHINO, S., SAKAI, N., JAHN, P.
of three fillies born to the same sire. Veterinary Quarterly
32, 2, 99-102.

MAYHEW, J. (2011). Seizures, syncope and sleep
attacks. Paper presented at the The equine head, Equine
chapter meeting at the ACVSc science week, Gold Coast,
Queensland, Australia.

STRAIN, G. M., OLCOTT, B. M., ARCHER, R. M.,
MCCLINTOCK, B. K. (1984): Narcolepsy in a Brahman
bull. Journal of the American Veterinary Medical Associ-
ation 185, 5, 538-541.

Review of pathophysiology and clinical management of
narcolepsy in dogs. The Veterinary Record 161, 11,
375-380.