Sleep Attacks with Associated Sleep Terrors in a Six Year Old Thoroughbred Gelding

T. Ahern*

Knockadoon Lodge, 17 Keymer Street, Ascot, 6104, Western Australia

Abstract: A six year old thoroughbred gelding presented with a two year history of somnolence and altered behavior of two years duration. In the three months immediately preceding presentation episodes of sleep attacks and accompanying sleep terrors were observed. There had been no evidence of recumbent or paradoxical sleep during this period. An examination of the upper airways revealed evidence of palatal instability (PI). An oral palatopharyngoplasty (OPP) was performed to reduce this instability (PI). Clinical observations in the eight months following surgery suggested a possible link between PI, upper airways obstruction (UAO) and a horse's ability to achieve adequate paradoxical sleep.

Keywords: Horse, oral palatopharyngoplasty, palatal instability, sleep terrors.

INTRODUCTION

Normal sleep patterns in equids had been previously investigated [1-3]. More recent studies into sleep attacks [4,5] and narcolepsy [6] often associated with recumbent sleep deprivation had been undertaken. The six year old gelding in this study presented with symptoms consistent with sleep attacks [4,6] and sleep terrors [7,8] but not narcolepsy as the horse would attempt to support itself during periods of collapse [5]. In this case there was an absence of physical, environmental or social factors [4] that had previously been associated with recumbent sleep deprivation. The possibility that PI [9], which occurred with a breakdown of the oropharyngeal seal (OPS) [2,10] and which could precipitate upper airways obstruction (UAO), may have contributed to a reduction in recumbent and thence paradoxical sleep, was postulated.

CASE DESCRIPTION

In July 2013 a rising 4 year old thoroughbred gelding was purchased to be trained for dressage. It was said to be unraced due to its under development, poor body condition and failure to cope with race training.

In October the horse was sent to a breaker to be re schooled as its aberrant behaviour suggested that its original education may have been inadequate. On the ground the horse appeared to have a split personality. It was extremely lethargic and frequently seen yawning, was prone to tripping and stumbling when walked in hand and yet could also become aggressive, biting and lashing out when being geared up. The lethargy and inattentive stumbling was also apparent when being ridden but at this stage there were no aggressive traits exhibited when under saddle.

One other unusual behaviour was its daily routine of moving to lateral recumbency for extended periods of up to two hours at a time. This most often occurred around late morning. This habit had unnerved many with concerns being voiced with regard to its health. Several subsequent veterinary examinations of both a medical and orthopedic nature revealed no significant or incriminating abnormalities. Despite frequent observations, only one report on the state of its eyes during these prolonged recumbencies was available. On this occasion the eyes appeared to be in a state of rapid eye movement (REM) but remained open. At one point the lids did close momentarily before opening again.

Several months later a professional trainer of some thirty years experience was employed to take over the horse's education as it appeared to have little respect for its owner and others who were involved with its handling. One example of what was perceived to be a lack of respect was when, on a number of occasions and with different attendants, as the lead rope was being attached, the horse would suddenly lurch forward and walk straight over the handler. At other times the horse would firstly roll its eyes into the back of its head as occurs in an oculogyric crisis (OGC). It would then take several short steps forward and launch itself into the air. On landing, it appeared to return to a normal state. This did not occur under saddle. In the months that followed these incidents the handler adopted the tact of using physical and audible stimulation to arouse the horse when altered behaviors were anticipated. There appeared to be some reduction in these,

*Address correspondence to this author at the Knockadoon Lodge, 17 Keymer Street, Ascot, 6104, Western Australia; E-mail: ahernvet@hotmail.com

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however the lethargy, stumbling and daily recumbencies continued.

In August 2014 the horse was taken to a training camp and yarded overnight without company. The following day the horse was readied for its lesson and mounted. The rider then urged it forward. It took two steps and then exploded. Those present stated that in what seemed to be only a split second the horse was forty meters further down the arena. A period of uncoordinated bucking and kicking then followed which lasted for several minutes. This behaviour from a horse previously described by its owners as lethargic and rarely seen exercising. The rider found herself on the arena floor with a handful of mane in one hand.

As time passed, the episodes of unpredictable behavior continued. On several occasions whilst standing in the wash bay an oculogyric crisis (OGC) would be evident. The horse would then launch itself into the air, halt, charge forward, launch, halt and continue this for up to a minute. On one occasion when the horse had just been saddled, it suddenly exploded crashing into walls, seemingly oblivious to the presence of obstacles or people. It then leapt out of the barn and charged over two twenty meter sand piles and eventually careered into a ditch. These were obstacles that in normal circumstances this horse would avoid.

In May 2015 the daily periods of recumbency appeared to cease. There had been no significant changes in environment or herd status as the horse was on the same property and still paddocked next to a dominant mare. After this the next major incident was when the property owner was awakened at 2 AM by the sounds of what she described as 'blood curdling screams' coming from the barn. The horse was found staggering, screaming, lashing out and throwing itself on the walls with such force that plaster was being dislodged in the next room. There appeared to be little coordinated or conscious control over these actions. Several minutes passed and the events ceased. Two further incidents occurred when the head collar was being fitted prior to bringing the horse in from the paddock. On the first occasion the horse lurched forward knocking the handler to the ground before collapsing. The second episode was more severe. As the head collar was being placed the horse firstly extended its head and neck and its body appeared to stiffen. Rapid eye movements were evident before it collapsed backwards over the fence. It then got to its feet and careered down the fence line, staggering and kicking out as though a dog was snapping at its heels. The previously described screaming then began whilst the horse continued cantering about the paddock. Several minutes later this behaviour ceased and the horse was able to be taken in hand. It was sweating profusely, tachycardic with visible pulsations of the chest wall.

Treatment

On the 29th of August 2015 the horse presented at the authors practice. At this time fourteen weeks had elapsed since there had been any evidence of recumbent sleep. There had been no significant environmental or social changes during this period and historically the horse was able to physically attain recumbency [4]. An upper airways examination revealed significant ulceration and wear of the mid free border of the soft palate. In the authors opinion this was typical of the changes seen in cases of chronic PI [9,11]. In the absence of any other etiological avenues, the possibility that PI [9] or pharyngeal instability [12] with resultant UAO may have been impacting negatively on the horse's ability to experience sufficient paradoxical sleep was discussed with the owner. It was then agreed that the horse would undergo an oral palatopharyngoplasty (OPP) [13] procedure in an attempt to reduce the incidence of this instability. Following surgery the horse was rested for eight weeks prior to resuming training. In the immediate postoperative period the horse, which was already in poor condition, lost considerably more weight.

RESULTS

In the eight months since resuming ridden exercise the horse had steadily gained weight. There had been no significant alterations to its diet. It was now described by its owner as being in extremely good condition with a normal healthy coat. The horse also resumed regular recumbency although more often during the evening rather than late morning which had been its habit. There had been no further episodes of collapsing, screaming or other untoward behaviours. Stumbling was now a rarity and the horse was described as being alert and keen to work. The yawning had ceased.

DISCUSSION

Somnolence as a consequence of paradoxical sleep deprivation had been recognised in horses [4,5]. Horses required 30 to 60 minutes of paradoxical or deep sleep daily [1,2,5]. Investigations into paradoxical

sleep deprivation in horses included studies on equine narcolepsy [6] and sleep attacks [4,5].

Parasomnias such as sleep terrors [7,8] had not as yet been formally researched in equids. In humans sleep terrors share the same root causes as sleepwalking. People experiencing sleep terrors were usually described as being inconsolable and unresponsive. Expressions of fear or panic often preceded episodes of screaming. They could lash out and often behave as though they were trying to flee some form of physical threat [8]. One causative group was sleep disorders including obstructive sleep apnea (OSA) [14], that occurred with repetitive collapse of the upper airway. There were numerous treatments for OSA including several surgical options which attempted to reduce the incidence of UAO [15].

In equids there had been considerable research into upper airways collapse during exercise [10] but non to date on the possibility that similar obstructions could occur during recumbent or deep sleep. Pharyngeal instability or PI during exercise had been frequently diagnosed in both racing [10] and sport horses [12] and was often associated with periods of decreased pharyngeal muscular tone or tension. During deep or paradoxical sleep muscular tone including pharyngeal was at its lowest [4]. If nasopharyngeal compliance was to yield to negative inspiratory pressures then logically it would be at these times. If this was the case then surgical procedures which aim to support the nasopharyngeal airway during periods of increased exercise demand may also be indicated where the airways are prone to collapse during periods of deep or paradoxical sleep.

In this case report the horse presented with somnolence and sleep attacks which were accompanied by symptoms of sleep terrors and other behavioural anomalies which may or may not have been related. The only ocular observation made during the extended periods of recumbency suggested that REM was occurring whilst the horse's eyes were still open. REM and paradoxical sleep normally occurred with the lids closed. Episodes that resembled human sleep terrors were those where the horse was found screaming, lashing out as though threatened and at the same time it was said to be disorientated and inconsolable.

In the absence of environmental or social changes [4] that could precipitate sleep deprivation and thence sleep attacks, and given the extensive history, it was decided that an upper airways examination was appropriate. Palatal instability (PI) were diagnosed and an oral palatopharyngoplasty (OPP) [13] was performed. Initial weight loss coincided with a rationed fibre only diet in the two weeks following surgery. Also contributing to this loss was the fact that the horse had presented for surgery in both a fatigued state and in very poor condition.

Once returned to training the previously apparent somnolence, sleep attacks, sleep terrors and altered behaviours dissipated. The exact time frames for each were not known. However there were certainly no further episodes of sleep attacks or sleep terrors reported.

In this case it could be postulated that there was a correlation between pharyngeal or palatal instability, UAO and the horses ability to acquire adequate deep or paradoxical sleep. Further case studies with more rigorous pre and post operative assessment would be required to confirm or refute any possible connection.

AUTHORS' DECLARATION OF INTERESTS

No affiliations and no conflicting interests have been declared.

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