

Katherine Wells - Queen Mother Student Travel Award Report 2009

Clovelly Intensive Care Unit
Scone Veterinary Hospital
Scone
NSW
Australia

I am sincerely grateful to the BEVA trust for enabling me to visit the Clovelly Intensive Care Unit in the Hunter Valley, Australia. Having always had a keen interest in equine reproduction and neonatology, visiting the world renowned Clovelly ICU was an invaluable experience.

Background

My two week visit to the Scone Veterinary Hospital took place from 14th-27th September 2009 during the height of the Thoroughbred breeding season in the southern hemisphere.

The Clovelly ICU, part of the Scone Veterinary Hospital, is situated in the heart of the Hunter Valley, the largest Thoroughbred breeding region outside Kentucky. Run by Jane Axon, a registered specialist in equine medicine and an expert in neonatal intensive care, Clovelly is a unique hospital providing 24 hour care for critically ill neonates and adults and post operative cases. During the Thoroughbred breeding season, the hospital may see over 800 horses and foals, with a diverse caseload ranging from caesareans to colics and cases of neonatal septicaemia to hypoxic ischaemic encephalomyelopathy. Clovelly ICU is able to accommodate up to 40 horses and comprises of three barns; one for neonatal intensive care, one for adult intensive and post-surgical care and a separate isolation block.



Visit Aims and Objectives

Having always held an interest in equine medicine, more specifically reproduction and neonatology, my aim in visiting Clovelly was to further my knowledge and practical experience in these areas. These

relatively specialised aspects of equine practice unfortunately form only a very small part of the curriculum of an undergraduate degree. Therefore, I felt that visiting Clovelly was the best way for me to pursue my interests. The opportunity to learn from the expertise of the specialist veterinarians at Clovelly, benefiting from their extensive theoretical and practical knowledge and experience, was an opportunity unavailable in the UK.

Daily Routine

The Clovelly ICU is staffed 24 hours a day and emergencies arrive frequently and at any time of the day or night therefore, although there is a general daily routine, it is frequently interrupted! Rounds commence at 7am, with examination of all post-surgical cases with their respective surgeons. This is followed by a detailed examination of all of the cases in intensive care and, finally, in isolation. Each patient is discussed in detail by the three veterinarians and the intern and any further diagnostic tests or changes to therapy are decided upon. The remainder of the day is filled with routine procedures, treatments and emergency admissions. Routine procedures include:

- Routine ultrasound of the urachus of each foal due to the high incidence of patent urachus in hospitalised neonates.
- Thoracic ultrasound of any foal which has either a history of respiratory disease or which, during morning rounds, has auscultable abnormalities or shows any signs of respiratory disease.
- Care of recently foaled mares – In the activity surrounding the critically ill neonate, it would be easy to forget the care of the post-foaling mare. However, each mare is examined daily by the veterinarians and routine post-foaling treatments e.g. uterine palpation and lavage are attended to.
- Attention to orthopaedic abnormalities – Commonly, upon presentation to Clovelly, the neonatal foals will display varying degrees of tendon laxity or contraction and angular limb deformity. With early attention, many of these abnormalities may be rapidly corrected without invasive procedures. For example, with mild flexor tendon contraction, daily bandaging and physical therapy may lead to a dramatic improvement within as little as 24 hours. For more severe cases, the use of carefully applied splints or the use of an oxytetracycline and saline infusion may be indicated.
- Examination of post-surgical wounds and daily bandage changes.
- Hospitalised foals are very prone to ocular injury, due to recumbency, a weak menace response and reduced corneal sensitivity in comparison to adult horses. Entropion is also a common finding in hospitalised neonates. Therefore surgical correction of entropion and the identification of corneal ulceration, using fluorescein dye, and subsequent antibiotic therapy is routine practice.
- Other routine procedures include the placement of nasogastric feeding tubes and blood sampling, allowing the clinical progression of disease processes and response to therapy to be monitored.

Isolation and Biosecurity

Biosecurity and isolation protocols are of paramount importance at Clovelly. Neonates are inherently very susceptible to infection and, furthermore, newly admitted foals frequently have at least partial failure of passive transfer of immunity. All of the intensive care patients, however, are at risk from nosocomial infections and may also shed otherwise latent infections e.g. herpes virus 1, salmonella, etc. As a result, clean gloves are worn to examine each individual patient and frequent hand washing is

encouraged. All foals which present with or develop diarrhoea are isolated and, due to the relatively high frequency of normally quiescent MRSA within in the local horse population, all wound exudates are cultured and the horses isolated until they test negative.

Case Example

History – A full term colt foal was presented to the clinic at 3am following an assisted parturition. Due to twisting of the placenta and it being a ‘red bag’ delivery (i.e. premature placental separation) the foal was immediately referred to Clovelly.

Presentation – On arrival at Clovelly, the foal was laterally recumbent but responsive to stimulation. There was significant meconium staining over the body and evidence of meconium aspiration.

Clinical findings:

- Cardiovascular system – The foal had a heart rate of 88bpm with a regular rhythm and no auscultable murmurs, cold extremities and no palpable peripheral pulses. The mucous membranes were markedly icteric.
- Respiratory system – Thoracic auscultation revealed harsh lung sounds and ‘crackles’ bilaterally, with an irregular respiratory rhythm and a rate of 36 bpm.
- Gastrointestinal system – The abdomen was notably distended with reduced borborygmi. Signs of meconium diarrhoea were evident around the perineum and, although the foal was actively searching, there was no suck reflex.
- Urogenital – The umbilicus was markedly enlarged and swollen and a small hernia was present.
- Eyes – Bilaterally, there was scleral congestion, entropion and corneal ulceration.
- Musculoskeletal – flexor tendon laxity was present in all four limbs.



Preliminary diagnosis – meconium aspiration, sepsis and hypoxic ischaemic encephalomyelopathy.

Diagnostic tests and procedures performed:

- Placement of an intranasal oxygen tube, a feeding tube and an 'over the wire' intra-venous catheter.
- Blood sample for haematology, biochemistry, fibrinogen levels and blood culture.
 - The fibrinogen levels were markedly elevated and there was a neutrophilic leucocytosis. However, the blood culture was negative. Despite this, the results suggested septicaemia was likely. The urea and creatinine levels were also markedly elevated, indicative of reduced renal perfusion or renal injury.
 - As a result, the foal was re-sampled daily to monitor the efficacy of the resultant therapy.
- Urine specific gravity – ideally, the USG should be <1.008 in foals therefore it was measured as often as a sample could be obtained. This permitted monitoring of renal function and the efficacy of the fluid therapy.
- Indirect blood pressure – It is important to maintain the mean arterial blood pressure above 60mmHg to ensure that there is adequate perfusion of all organs, particularly the kidneys. The foal's initial blood pressure was 80mmHg, however it subsequently fell to <60mmHg and therefore treatment was instigated (see below).
- Radiographs – These were obtained to assess the degree of carpal and tarsal bone mineralization. It was concluded that they displayed grade 3 hypo-mineralisation (i.e. all bones showed evidence of mineralisation however this was incomplete, with rounding of the bones and an absence of the normal 'adult' outline).
- Regular physical examinations – initially these were performed every 2 hours and as the foal's condition began to improve the frequency was decreased.
- Monitoring of urinary and faecal output.
- TLC – whilst recumbent, the foal was maintained in sternal and turned every two hours, when he was also stood for a few minutes and gentle thoracic coupage performed.

Treatment

- Intranasal oxygen at 10L/min.
- Fluids – An initial 2L bolus of Hartmann's fluid was administered and the foal was reassessed. Due to a significant improvement in pulse quality and peripheral perfusion, the rate was reduced to maintenance (100ml/hr). This rate was altered in accordance with fluid intake and hence gradually reduced as parenteral and enteral nutrition were commenced.
- Glucose – initially, 10% glucose was administered at a rate of 150ml/hr. With the addition of total parenteral nutrition (TPN), 5% glucose at 75ml/hr was commenced and reduced as the volume of milk ingested increased and was able to meet the nutritional demands of the growing foal.
- TPN – due to likely GIT ischaemic injury, abdominal distension and diarrhoea the foal was not allowed to suckle. TPN was introduced at a rate of 25ml/hr and increased to 100ml/hr over the next 12 hours. As enteral nutrition commenced, the rate was gradually reduced.
- Plasma – 2L were administered (due to an absolute failure of passive transfer of immunity) and the IgG status of the foal assessed 24 hours later to ensure that IgG was >8g/L.
- Antibiotic therapy – the foal showed signs of sepsis therefore broad spectrum bactericidal antibiotics were commenced. 1.5g of benzylpenicillin IV, 7mls trimethoprim-sulphadoxine IV and 5.4mls of gentamicin IV were administered daily.

- Blood pressure support – Vasopressin was started at a rate of 2.2ml/hr due to an increase in USG (suggestive of inadequate renal perfusion). Dobutamine was also later added at a rate of 12ml/hr. Both drugs were discontinued as the USG returned to normal.
- Enteral nutrition – with reduced abdominal distension and a resolution of the diarrhoea, 50mls of colostrum were initially fed via the feeding tube every 4 hours. The foal tolerated oral nutrition well and showed no signs of colic therefore 50mls of mare's milk was fed every 2 hours with a progressive increase in volume up to 100mls. Once the foal developed a strong suckle reflex and was able to ambulate, he was allowed to nurse from the mare, once again gradually increasing the volume ingested at each feed.
- Surgical correction of the entropion and topical antibiotic therapy for the corneal ulceration, with regular staining to monitor the resolution of the ulcers.

Outcome

Nine days after being admitted to Clovelly, the mare and foal both returned to the stud. Although the foal was discharged on a course of rifampin and trimethoprim-sulphadoxine, it is anticipated that he will make a full recovery.



Conclusion

I am truly grateful to the BEVA trust for giving me the opportunity to visit Clovelly. I thoroughly enjoyed my time at Scone despite two weeks of little sleep and high emotions, as a result of working all hours of the day and night with many successful outcomes and, unfortunately, the occasional sad story. My placement allowed me to explore in more detail this area of equine medicine which has always fascinated me and I am now more determined than ever that equine medicine is the correct career path for me. I hope to be able to pursue my interest in equine reproduction and neonatology in the future and, as a result, I plan to apply for the intensive care internship run at Clovelly.