Proceedings of the 49th British Equine Veterinary Association Congress
BEVA

Sep. 8 – 11, 2010
Birmingham, United Kingdom

Next Congress:

BEVA Congress
British Equine Veterinary Association
7-10th September 2011 • Liverpool, UK

Reprinted in IVIS with the permission of the British Equine Veterinary Association – BEVA
Foal anaesthesia

Lori A. Bidwell
Ross University. School of Veterinary Medicine, Basseterre, St. Kitts, West Indies.

There is minimal published research regarding foal anaesthesia and pain management, therefore anaesthetic and analgesic drug dosages are often extrapolated from those published for adults. Foals older than 6 months of age can be treated like adults in regards to anaesthetic protocols. Unhealthy foals have physiological characteristics similar to a neonate and can be treated as such when determining sedative and anaesthetic protocols. Neonates are more sensitive to anaesthetics due to increased permeability of the blood brain barrier, an immature hepatic and sympathetic nervous system and a lower percentage of body fat to assist in redistribution of anaesthetic (Dunlop 1994).

Complications to expect associated with anaesthetics in neonates and foals are vasodilation, hypothermia, hypercapnia, hypercapnia and dependent lung atelectasis. Oxygen supplementation by oral intubation or nasal intubation is recommended during procedures requiring prolonged recumbency. Sterile ophthalmic lubrication is essential to prevent corneal abrasions in sedate and anaesthetised foals. Additionally, the mare should remain with the foal during sedation and until complete induction when a procedure requires general anaesthesia. Removal of the mare during sedation or induction will produce excitement in both the foal and mare. The mare can be sedated with a combination of 150 mg acepromazine and 150 mg xylazine or an equivalent amount of romifidine or detomidine.

Alpha-2 adrenergic agonists, benzodiazepines and butorphanol are common choices for sedation in foals. Drugs can be administered alone or in combination and given i.v. or i.m. Foals less than one week of age may lie down when they feel tired or sleepy. Therefore, small amounts of sedatives will produce recumbency allowing for easy handling for noninvasive procedures. In a 30–40 kg foal, a dose of 2 mg (range 2–5 mg) of butorphanol with 2.5 (range 2.5–5 mg) midazolam or diazepam administered i.v. will result in recumbency that lasts 15–30 min. By the addition of 100–150 mg ketamine i.v., a more invasive procedure can be performed like a joint flush or urinary catheter placement. Healthy foals older than 2 weeks might require the addition of an α2 agonist such as xylazine (30–80 mg i.v.) alone or combined with butorphanol, followed by 150–200 mg ketamine i.v. alone or combined with a benzodiazepine. Older foals (>1 week of age) will typically not become recumbent when sedated; therefore, these foals may need to be placed in lateral recumbency after administration of ketamine/diazepam.

For longer surgical procedures performed under general anaesthesia, a thorough physical examination and blood work (minimum: packed cell volume, total protein, white blood cell count and fibrinogen) should be included in the preanaesthetic work-up (Behr et al. 1981; Lakritz et al. 1992; Perkins et al. 1998). Pulse oximetry, capnography, arterial blood pressure and arterial blood gases are recommended monitors to determine oxygenation and quality of ventilation. Assisting ventilation at 1–2 breaths/min aids in opening atelectic airways and preventing hypercapnia. Maintenance fluids should be administered at a rate of 10–15 ml/kg bw/24h.

The minimum alveolar concentration (MAC) of isoflurane in neonates is lower than adults; 0.84% vs. 1.3–1.6% for adults (Dunlop et al. 1989). Inhalant anaesthetic can be initiated at 2% isoflurane or 3% sevoflurane and then decreased to 1.5 and 2.5% respectively within 5 min of initiation. Anaesthetic concentration should be determined by clinic signs indicating depth. Blood pressure is helpful in determining depth of anaesthesia in foals but vasodilation can occur rapidly despite the fact that a surgical plane of anaesthesia has not been achieved. Mean arterial blood pressure should be maintained above 55 mmHg in young foals although normal mean blood pressure is typically lower in neonates up to one week of age (47–50 mmHg). Older foals should be treated as adults regarding blood pressure, with a goal of the mean arterial pressure above 70 mmHg. Normal heart rate in neonates is between 70–90 beats/min and can range between 40–60 beats/min in older foals (Rossa1de 1970).

Recovery should be in a warm environment, often in the stall with the dam for neonates or in a recovery stall for older foals. It is helpful to have a blanket to cover the foal while it recovers. Warm blown air or circulating hot water blankets are ideal to warm the foal.

References and further reading


