

# Reported morbidities following 861 anaesthetics given at four equine hospitals

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POSTANAESTHETIC morbidity prolongs convalescence, thus increasing costs to the client, and can lead to death. Most information available on postanaesthetic morbidity in horses relates to musculoskeletal disorders, such as postanaesthetic myopathy or fractures (Richey and others 1990, Young and Taylor 1993). More recently, the prevalence of postanaesthetic colic after non-abdominal procedures has been estimated retrospectively (Senior and others 2004, 2006, Andersen and others 2006). Information relating to other types of post-anaesthetic morbidity is scarce. This short communication describes a multi-centre prospective study conducted to estimate the prevalence of and identify risk factors for reported morbidities in horses undergoing non-abdominal procedures at four equine hospitals in the UK.

The hospitals were chosen on the basis of staff affiliations and their ability to record data and to reflect different horse populations and caseloads. Data were collected prospectively on all horses admitted to each centre for non-abdominal procedures requiring general anaesthesia between April 2004

and June 2005. The in-house data collection systems at each of the four centres were modified to incorporate the additional admission, hospitalisation and discharge data required for the study. Case definitions of specific morbidities were agreed at the beginning of the study by the participating centres (Table 1). At the end of the study, the records at each centre were collated by one investigator (R. A.).

Data were collected from a total of 861 anaesthetics. The frequency of each type of morbidity is shown in Table 2. The overall prevalence of reported morbidities was 13.7 per cent; the most commonly reported morbidity was postanaesthetic colic (5.2 per cent), defined as any recognised sign of abdominal pain (Tinkler and others 1997) that could not be attributed to any concurrent disease. In 31 of the 45 colic cases (68.8 per cent) the cause of the signs of colic was undiagnosed, so it is possible that some cases were misdiagnosed even though a large proportion responded to medical therapy for colic. Postanaesthetic lameness, for example, due to myopathy, neuropathy or fractures, was reported in seven cases (0.8 per cent); this is in contrast to previous, retrospective, estimates of prevalence of 1.4 per cent (Young and Taylor 1993) and 6.4 per cent (Richey and others 1990). However, the results from previous studies may be outdated; it is widely considered that improved understanding of the risk factors involved in the development of postanaesthetic myopathy, and the availability of more effective prophylactic measures, appears to have reduced the incidence of postanaesthetic lameness. The present study appears to support this theory. The prevalence of some of the morbidities varied between the centres.

There were two mortalities that were directly related to the anaesthesia. One horse died from a fractured neck, and one horse was euthanased because of a fractured left proximal humerus, giving a mortality rate of approximately 0.2 per cent.

*Veterinary Record* (2007) **160**, 407-408

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**TABLE 1: Case definitions for postanaesthetic morbidities agreed by the four centres**

Morbidity	Definition
Thrombophlebitis	Inflammation of a vein with blood clot formation inside the vein at the site of inflammation. Clinical signs: hardening, redness, warmth, pain along a superficial vein (worse when pressure is applied). Diagnosis on basis of clinical signs or ultrasonography
Pyrexia	Rectal temperature greater than 39°C
Respiratory distress/obstruction	Respiratory distress/obstruction necessitating intervention, such as tracheostomy, nasotracheal intubation
Pulmonary oedema	Presence of a cough, wheezes, crackles on auscultation, evidence of pink frothy fluid at the nares or mouth, or on endoscopy of the airway, or at postmortem examination
Muscle weakness	Horse unable to support weight evenly out of the recovery box on all four limbs within an hour of getting up
Muscle damage	Creatinine kinase levels >15,000 iu/l; painful, swollen muscles, sweating; myoglobinuria
Prolonged recovery	Recumbent in recovery for more than 30 minutes per hour of anaesthesia time
Colic	Any recognised sign of abdominal pain (Tinkler and others 1997), for example, pawing, lying down, flank watching, curling of the upper lip and kicking at the abdomen, occurring within 72 hours of anaesthesia that could not be attributed to any concurrent disease
Neurological problems	Facial nerve damage, radial nerve damage, transient blindness (an absent menace response); inability to negotiate an obstacle course
Miscellaneous	Complications associated with anaesthesia not classified under other headings, for example, wounds sustained in recovery

**TABLE 2: Prevalence of postanaesthetic morbidities recorded at four equine hospitals over a 15-month period between April 2004 and June 2005**

	Total (% [95% CI])	Centre			
		A (%)	B (%)	C (%)	D (%)
<b>Anaesthetics</b>	<b>861</b>	<b>248</b>	<b>162</b>	<b>194</b>	<b>257</b>
Colic	45 (5.2 [3.8-6.9])	13 (5.2)	12 (7.4)	15 (7.7)	5 (1.9)
Prolonged recovery	37 (4.3 [3.0-5.9])	4 (1.6)	7 (4.3)	6 (3.0)	20 (7.8)
Thrombophlebitis	8 (0.9 [0.4-1.5])	1 (0.4)	5 (3.0)	2 (1.0)	0
Pyrexia, depression, leucopenia	6 (0.7 [0.3-1.5])	3 (1.2)	2 (1.2)	1 (0.5)	0
Wounds sustained in recovery	6 (0.7 [0.3-1.5])	3 (1.2)	1 (0.6)	1 (0.5)	1 (0.4)
Lameness, myopathy, neuropathy	5 (0.6 [0.2-1.4])	3 (1.2)	1 (0.6)	0	1 (0.4)
Colitis, diarrhoea	5 (0.6 [0.2-1.4])	0	0	4 (2.1)	1 (0.4)
Respiratory distress	3 (0.3 [0.1-1.0])	0	0	3 (1.5)	0
Fractures	3 (0.3 [0.1-1.0])	0	0	0	3 (1.2)

CI Confidence interval

This compares favourably with the mortality rate of 0.9 per cent reported by Johnston and others (2002) for 'non-colic' anaesthesia in horses. However, the study populations were different, that is, the present study surveyed only non-abdominal procedures for 72 hours after anaesthesia in a relatively small number of animals in the UK.

The authors believe that the results of the present study represent minimum values for the prevalences of at least some of the morbidities investigated, it is possible that mild cases of some morbidities may not have been recorded. Further analyses are in progress on the morbidities that were sufficiently prevalent to enable statistical evaluation. The authors believe that more extensive prospective studies, evaluating the prevalence of specific postanesthetic morbidities in horses and identifying associated risk factors, are required.

### ACKNOWLEDGEMENTS

The authors thank their colleagues at each centre for their help in data collection during the study. The study was supported by funding from the RCVS Trust and the University of Liverpool Research Development Fund.

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