



Influence of hypotension, hypoxemia, and hypercapnia, on the recovery of horses after general anesthesia – preliminary data.

Román Durá B.¹, Dupont J.¹, Dunham O.², Caballero Delgado G.¹, Salciccia A.¹, Sandersen C.¹

1. Department for Clinical Sciences of Equids, FARAH, ULiège.

2. Department for Clinical Sciences of Companion Animals, FARAH, ULiège.

Introduction

Equine anaesthesia is more likely to result in morbidity and mortality compared to other commonly anesthetized animal species. The period of recovery remains the phase associated with the greatest risk of mortality in horses. Intra-operative hypotension, hypoxemia, and hypercapnia, are recognized as potential determinants of recovery quality. This study aimed to explore how these factors influence recovery outcomes and compare complications between elective and emergency procedures.

Methods

A retrospective analysis was conducted on 1092 horses undergoing standardized general anesthesia at the Equine University Hospital of Liège.

Inclusion criteria:

- Weight >150 kg
- Age >6 months

Variables analyzed:

- Age, sex, breed, American Society of Anesthesiologists (ASA) physical status, weight, duration of anesthesia.
- Presence of hypotension, hypoxemia, hypercapnia, and hypothermia.

Recoveries were graded as "good" or "bad," and logistic regression analysis was used to identify predictors of recovery quality. Data were categorised according to different cut-off values for recovery and entered in R (R Core Team (2024)) for analysis using the STATS package.

Results

- Hypoxemia was a major predictor of poor recovery, especially in horses treated with salbutamol.
- High ASA, hypotension, and long anesthesia durations were significantly associated with poor recovery outcomes.
- Hypotension and hypoxemia were more frequent in emergency procedures, worsening recovery outcomes.

| Variable | Good recovery (n= 907) | Bad recovery (n= 185) | Total (n= 1092) |
|--|---------------------------|--------------------------|--------------------|
| Hypotension | 514 (56.7%) | 114 (61.6%) | 628 (57.5%) |
| Hypoxaemia | 106 (11.7%) * | 23 (12.4%) * | 129 (11.8%) |
| Hypercapnia | 29 (3.2%) | 11 (5.9%) | 40 (3.7%) |
| Duration anaesthesia (minutes; mean ± SD) | 111.37±6.17 * | 147.81±30.27 * | 117 (10-340) |
| Colic | 156 (17.2%) | 75 (40.5%) | 231 (21.2%) |
| ASA V | 7 (0.8%) * | 6 (3.2%) * | 13 (1.2%) |

Table 1. Anaesthesia variables in 1092 horses undergoing general anaesthesia, with recovery outcomes classified as "good" or "bad" based on recovery scores.
*Significantly different.

Conclusion

This research highlights the complex nature of anaesthetic recovery in horses and underlines the importance of rigorous monitoring and management of critical factors such as hypoxemia, hypotension, and the duration of anaesthesia. Our results advocate for further investigation into anaesthetic practices to enhance recovery quality, aiming to reduce mortality rates and improve overall patient outcomes.

