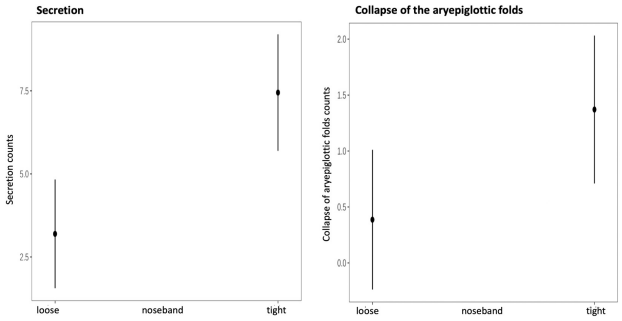
Effects of tight nosebands on the upper airways of horses

Dominik Scholler, Anna May

Equine Clinic of Ludwig Maximilians University, Sonnenstrasse 14, 85764 Oberschleissheim, Germany

Figure 1: The Videomed Active Airway Endoscope was used in this study.
Figure 2: Complete equipment on the horse.



Introduction:

The public perception of animal welfare in equestrian sports depends on training methods and presentation of horses at equestrian events. The often very tightly buckled nosebands, which are intended to prevent the horse from opening its mouth in response to a hard hand impact, also attracted a lot of attention. Various studies have evaluated the impact of tight nosebands on so-called stress parameters – whereas the situation inside the pharynx has not yet been further looked at. Therefore, the main aim of the study was to evaluate the response of the pharyngeal structures to tight versus loose nosebands using overground endoscopy.

Materials and methods:

- 16 warmblood horses (main state stud farm of Bavaria in Schwaiganger)
- approval by government of Bavaria, Germany (approval AZ ROB-55.2-2532.Vet_02-21-100)
- video analysis: 5 freeze frames analyzed at beginning of expiration at rest/during exercise
- pharyngeal diameter: ratio of epiglottic width and a perpendicular line to a fixed point at the dorsal nasopharyngeal wall
- other findings: swallowing, pharyngeal collapse, soft palate movements and secretion

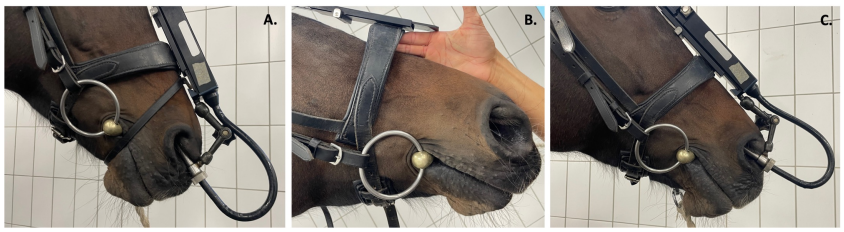


Figure 3: Noseband fastening in the horses prepared for the study: A. Noseband tightened so no fingers can be placed between bridge of the nose and noseband and additional flash strap in place. B. Two-finger rule applied for the horses ridden with loose noseband. C. Loose noseband in place.

Results:

The pharyngeal-epiglottic-ratio (PE) did not change between the groups. There was a significant increase in parameters associated with discomfort in the pharyngeal region in loose vs. tight nosebands:

- Secretion (p = 0.002)
- Collapse of the aryepiglottic folds (p = 0.001)
- Pharyngeal collapse (p = 0.09)

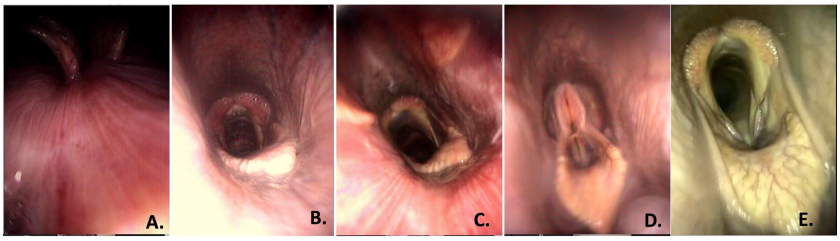


Figure 4: Endoscopic parameters evaluated in this study: A. Swallowing B. Secretion (amount and type) C. Pharyngeal collapse D. Clenching of the arytenoids E. Prolapse of the aryepiglottic folds.

Parameter	Mean total counts with tight noseband	Mean total counts with loose noseband	P value loose - tight
Swallowing	5.35 (SE 1.012)	4.41 (SE 0.967)	0.191
Secretion	7.45 (SE 0.865)	3.20 (SE 0.797)	0.002
Pharyngeal collapse	6.18 (SE 1.63)	2.56 (SE 1.39)	0.086
Clenching arytenoids	9.32 (SE 2.70)	9.05 (SE 2.44)	0.933
Collapse aryepiglottic folds	1.37 (SE 0.322)	0.39 (SE 0.302)	0.011
Soft palate instability	330 (SE 61.8)	278 (SE 56.9)	0.548
Pharyngeal-epiglottic-ratio	1.30 (SE 0.044)	1.28 (SE 0.041)	0.750
RHE score	6.30 (SE 0.555)	4.75 (SE 0.548)	0.0004

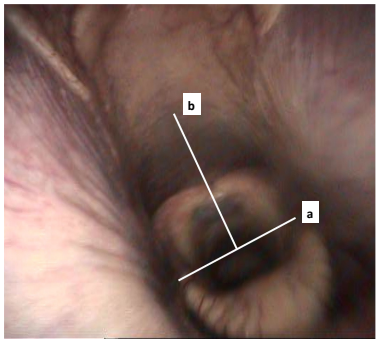


Figure 5: PE ratio → the length on the epiglottis (a) as well as the distance of the perpendicular from the fixed point on the dorsal pharynx to the reference length on the epiglottis (b) were measured on the freeze frames

Conclusion:

The results show that tight nosebands do not only cause stress reactions visible from the outside, but also contribute to discomfort and adverse reactions in the pharyngeal region, such as secretion and collapse of pharyngeal structures. At the same time swallowing seemed to be inhibited. These results may provide objective evidence for future decisions of equestrian sports organizations concerning further regulations on nosebands.

References:

Doherty et al.(2017). Noseband Use in Equestrian Sports - An International Study. PLoS One 12(1).
Fenner et al. (2016). The Effect of Noseband Tightening on Horses' Behavior, Eye Temperature, and Cardiac Responses. PLoS One 11(5).
McGreevy et al. (2012). The effect of double bridles and jaw-clamping crank nosebands on temperature of eyes and facial skin of horses. Journal of veterinary behavior 7(3).
Merkies et al. (2022). Noseband Fit: Measurements and Perceptions of Canadian Equestrians. Animals (Basel) 12(19).
Uldahl and Clayton (2019). Lesions associated with the use of bits, nosebands, spurs and whips in Danish competition horses. Equine Vet J 51(2).
Visser et al. (2019). Practice of Noseband Use and Intentions Towards Behavioural Change in Dutch Equestrians. Animals (Basel) 9(12).
Zebisch et al. (2014b). Effects of different head-neck positions on the larynges of ridden horses. J Anim Physiol Anim Nutr (Berl) 98(5).
Go et al. (2014). Pharyngeal diameter in various head and neck positions during exercise in sport horses. BMC Vet Res. 10(117).
Casey et al. (2013). A preliminary report on estimating the pressures exerted by a crank noseband in the horse. Journal of Veterinary Behavior-Clinical Applic. and Research. 8(6).
Ahern (2019). Mouth Opening During Ridden Exercise in Sports Horses: An Evasive Behaviour, an Indication of Pain or Discomfort or a Physical Adjustment to Facilitate the Oral Passage of Air During Inspiratory Efforts, World J Vet Science, 7.
Crago et al. (2019). An opportunistic pilot study of radiographs of equine nasal bones at the usual site of nosebands, Journal of Veterinary Behavior, 29.
Pérez-Manrique et al. (2020). Prevalence and Distribution of Lesions in the Nasal Bones and Mandibles of a Sample of 144 Riding Horses, Animals, 10(9).