



ORAL COMMUNICATION(S)

## RELATIONSHIP BETWEEN BACTERIAL OVERGROWTH, CLINICAL FEATURES, AND CYTOLOGIC FINDINGS IN SEVERE EQUINE ASTHMA

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Severe Equine Asthma (SEA) is a non-infectious, recurrent, allergic respiratory syndrome, characterized by chronic airway inflammation, airflow obstruction, and mucus hypersecretion. However, the presence of bacterial overgrowth in the lower respiratory tract can sometimes be found in horses affected by asthma (1). The aims of this retrospective study were to assess the prevalence of bacteria in the trachea of SEA horses, to identify and quantify the bacterial populations isolated by tracheal wash (TW) culture, to assess the difference in neutrophils count in bronchoalveolar lavage fluid (BALF) cytology among bacterial populations, and to assess the association between TW culture results and some clinical, endoscopic, and cytological findings. SEA horses were selected based on the presence of dyspnea, normal rectal temperature, and more than 25% of neutrophils in BALF. TW and BALF collection, and the microbiological analyses were performed as already described in the literature (2). In a total of 108 horses that met the inclusion criteria, clinical records about bacterial isolation, presence of productive cough, nasal discharge, findings on auscultation of the lungs (crackles and rhonchi), the degree of mucus in the trachea, presence of phagocytosed bacteria within neutrophils in BALF, and neutrophils count in BALF were reviewed. Based on microbiological analyses, 33 horses (30.6%) had a positive culture, whereas 75 horses (69.4%) were negative. The bacteria isolated were *Streptococcus spp.* (19/33; 57.6%), *Pseudomonas spp.* (4/33; 12.1%), *Actinobacillus spp.* (3/33; 9.1%), *Bordetella spp.* (2/33; 6.1%), *Staphylococcus spp.* (2/33; 6.1%), *Acinetobacter spp.* (1/33; 3.0%), *Klebsiella spp.* (1/33; 3.0%), and *Pasteurella spp.* (1/33; 3.0%). The Mann-Whitney test was used to assess the difference in neutrophils count between horses with a positive TW culture and those with a negative TW culture, as well as between the isolation of Gram- (12/33; 36.4%) and Gram+ (21/33; 63.6%) bacteria.

The Kruskal-Wallis test was used to assess the difference in neutrophils count among the bacterial populations. The chi-square test was used to assess the association between TW culture and the presence of productive cough, nasal discharge, crackles and rhonchi on lung auscultation, the degree of mucus in the trachea, and bacterial phagocytosis. The presence of phagocytosed bacteria within neutrophils was significantly higher ( $p=0.027$ ) in horses with positive microbiology. No significant differences in neutrophils count were found between horses with or without bacterial overgrowth, the isolation of Gram- or Gram+ bacteria, and among the bacterial populations. Finally, no significant differences in the clinical findings considered or the degree of mucus in the trachea were found between SEA horses with or without bacterial overgrowth. In conclusion, only one-third of SEA horses had bacteria in the TW, suggesting that bacterial overgrowth in the lower respiratory tract is not a consistent feature in severe asthma. Moreover, the most represented bacteria were *Streptococcus spp.*, *Pseudomonas spp.*, and *Actinobacillus spp.*; however, their presence seems to have no influence on symptoms or the presence of tracheal mucus in severely asthmatic horses. Finally, our results suggest that in the presence of bacterial phagocytosis, it should be considered appropriate to perform a bacterial culture.

### References

1. Manguin E, Pepin E, Boivin R, Leclere M, Lavoie JP, Moran K, et al. Tracheal microbial populations in horses with moderate asthma. *J Vet Intern Med.* 2020;34(2):986-995.
2. Ferrucci F, Zucca E, Croci C, Di Fabio V, Martino PA, Ferro E. Bacterial pneumonia and pleuropneumonia in sport horses: 17 cases (2001-2003). *Equine Vet Educ.* 2008;20(10):526531.