

Ampicillin-sulbactam Effect in Respiratory Infections in Thoroughbred Horses: A Preliminar Study

Morales A^{1,2}, Alves Nascimento C³, Nursikian A³, Rojas E³ and Villoria D²

¹Department of Pathology, Faculty of Veterinary Science, Central University of Venezuela, Venezuela

²Animal Health Division Racetrack, "La Rinconada" Caracas, Venezuela

³College of Pharmacy, University of Santa María, Caracas, Venezuela

Abstract

The aim of this study was to evaluate the effect of ampicillin-sulbactam in respiratory processes of Thoroughbred horses. We studied a total of 21 horses, (11 stallions and 10 mares) of Thoroughbred, all 2 years old, during the period of quarantine at the Hippodrome "La Rinconada" Caracas, Venezuela. History shows respiratory processes, characterized by purulent nasal secretion, cough, purulent nasal secretion, depression and anorexia. All horses under the same conditions of feeding and management. It was practiced a cytological, bacterial culture swab following conventional methods, from nasal swab. Then we preceded to antibiotic therapy based Calox Ampicillin-sulbactam, 7 mg/kg dose, and injection form every 12 hours and for 5 days. Gradually, each horse was evaluated during the 7 days by clinical and bacteriological examination final. The established antibiotic Ampicillin-sulbactam base for 7 days led to a clear positive clinical response and complete resolution in all cases studied from the seventh day. In relation to the isolated bacteria corresponded to 90% *Streptococcus equi*, while 5% *Staphylococcus aureus* corresponded to and 5% to *Klebsiella* sp. The resistance was observed for Nilidixic Acid, Ciprofloxacin and Penicillin. In conclusion, we demonstrated the effectiveness of Ampicillin-sulbactam in treating respiratory infections in Thoroughbred Horses.

Keywords: Equine; Ampicilina-sulbactam; Antibiotic

Introduction

Respiratory processes are relatively common in horse's athletes, as well as every day increases the number of reports of antimicrobial resistance. Particularly in the Racetrack "La Rinconada" Caracas-Venezuela, there are previous reports of antimicrobial resistance. The bacterial isolates in the Racetrack "La Rinconada" Caracas-Venezuela showed resistance to gentamicin, ciprofloxacin, nalidixic acid, trimethoprim, ampicillin and amikacin [1]. Efficacy of sulbactam, a beta-lactamase inhibitor, in combination with ampicillin, has been evaluated for treatment of experimentally induced pneumonia caused by beta-lactam-resistant *Klebsiella pneumoniae* [2]. The combination of sulbactam plus ampicillin was found to have synergistic effects *in vivo*, to reduce the extent and severity of experimentally induced Gram-negative lung infection in foals [2]. The aim of this study was to evaluate the effect of ampicillin-sulbactam in respiratory processes of Thoroughbred horses.

Materials and Methods

We studied a total of 21 horses (*Equus caballus*), (11 stallions and 10 mares) Thoroughbred, all 2 years old, during the period of quarantine at the Hippodrome "La Rinconada" Caracas-Venezuela. History shows respiratory processes, characterized by purulent nasal secretion, cough, purulent nasal secretion, depression and anorexia. All horses under the same conditions of feeding and management. It was practiced a cytological [3], bacterial culture swab following conventional methods, from nasal swab [4,5]. Then, we preceded to antibiotic therapy based Calox Ampicillin-sulbactam, 7 mg/kg dose, and injection form every 12 hours and for 5 days [6]. Gradually, each horse was evaluated during the 7 days by clinical and bacteriological examination final.

Results

In general, the results were 21 isolates: *Streptococcus equi* 19/21, *Staphylococcus aureus* 1/21 and *Klebsiella* sp. 1/21. Susceptibility: Cefalosporin: 90.47%, Penicillin: 66.6% Resistance: Nilidixic Acid 94.47%, Ciprofloxacin 85.71% and Penicillin 23.80%.

The clinical results are presented in the following Table 1.

Parameter clinics	Results
Temperature	37.8°-39.8° ± 38.6°
Frequency Respiratory	18-40 rpm ± 28
Frecuency Cardiac	35 lpm-64 lpm ± 52
Nasal secretion	18/21 cases
Cytology	Grade I Gram (+) (14/21) Grade II Gram (+) (7/21)
Cough	21/21
Leukogram Pre-treatment	15-14.6 mm ³
Leukogram Post-treatment	8-12 mm ³
Bacteria isolated	Pre-treatment <i>Streptococcus equi</i> 19/21 <i>Staphylococcus aureus</i> 1/21 <i>Klebsiella</i> sp. 1/21 Post-treatment Negative: 100%
Antibiogram	Susceptibility: Cefalosporin: 90.47% Penicillin: 66.6% Resistance Nilidixic acid 94.47% Ciprofloxacin 85.71% Penicillin 23.80%

Table 1: Results of the clinical evaluation, cytology, microbial and sensitivity.

*Corresponding author: Abelardo Morales, Department of Pathology, Faculty of Veterinary Science, Central University of Venezuela, E-mail: aamorales13@gmail.com

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Discussion

The established antibiotic Ampicillin-sulbactam base for 7 days led to a clear positive clinical response and complete resolution in all cases studied from the seventh day. In relation to the isolated bacteria corresponded to 90% *Streptococcus equi*, while 5% *Staphylococcus aureus* corresponded to, and 5% to *Klebsiella* sp. The resistance was observed for Nilidixic Acid, Ciprofloxacin and Penicillin. The emergence of resistance to various antibiotics is of considerable medical and correlates, with their use and sometimes uncontrollably in the treatment of infectious diseases [1,7-9]. In this situation raises new therapeutic molecules in the pharmaceutical industry with more power in less time and fewer adverse effects. In conclusion, we demonstrated the effectiveness of Ampicillin-sulbactam in respiratory infections in Thoroughbred Horses at 7 days post-treatment.

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References

1. Morales AB, García FG, Rossini MV, Morales MB, Coronado R, et al. (2010) Múltiple resistencia antibacterial en aislados de equinos Pura Sangre de carreras en el hipódromo "La Rinconada", Caracas, Venezuela. Rev Investig Vet Peru 21: 187-191.
2. Hoffman AM, Viel L, Muckle CA, Yager JS, Staempfli HR (1992) Evaluation of sulbactam plus ampicillin for treatment of experimentally induced *Klebsiella pneumoniae* lung infection in foals. Am J Vet Res 53: 1059-1067.
3. Banks W (1996) Histology veterinary applied. (2nd Edn) Manual Moderno, México.
4. Carter GR, Chengappa MM (1994) Micology and bacteriology veterinary. (2nd Edn), Manual Moderno, México.
5. Todar K (2008) Todar's online textbook of bacteriology, University of Wisconsin, USA.
6. Botana L, Landoni F, Martín T (2002) Pharmacology veterinary and therapeutically. Manual Moderno, Madrid, Spain.
7. New HC (1992) The crisis in antibiotic resistance. Science 257: 1064-1072.
8. Hammerum AM, Heuer OE (2009) Human health hazards from antimicrobial-resistant *Escherichia coli* of animal origin. Clin Infect Dis 48: 916-921.
9. Orsini JA, Benson CE, Spencer PA, Van Miller E (1989) Resistance to gentamicin and amikacin of gramnegative organisms isolated from horses. Am J Vet Res 50: 923-925.