

# Effect of oral administration of the bovine injectable formulation of enrofloxacin (Enrofan 5<sup>TM</sup>) on hematological parameters in horse

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Received: 07.03.2017

Accepted: 28.10.2017

## Abstract

Enrofloxacin is a useful antimicrobial drug for treatment of infectious diseases in the horse. The present study carried out due to the limitation of the approved route of administration of the drug (intravenous) and lack of data on its potential effects on hematological parameters in this animal species. Nine healthy mixed-bred (6 female and 3 male) horses, aged between 1-15 years, were randomly divided into three experimental groups (each 3 animals): Control group (with no drug dosing), enrofloxacin moderate-dose and enrofloxacin high-dose groups (using the bovine 5% enrofloxacin solution at 5 or 15 mg/kg body weight, respectively, every 12 hours, for three weeks). In addition to physical examination of all horses, blood samples were collected at five- time points during the study period including before (day 0), during (days 7, 14 and 21) and 4 weeks after completion of drug administration (day 49). Routine hematological tests were done on samples and data of three groups and trend of alterations of hematologic and biochemical parameters were analyzed. There were no significant changes in hematological parameters including hematocrit (PCV), hemoglobin (Hb), red blood cell (RBC) counts, white blood cell (WBC) and differential counts, platelets, as well as total plasma protein and fibrinogen levels among three groups during 5 sampling time points. The results suggest there were no significant hematological changes due to enrofloxacin at given dosing rates but more studies are needed in this regard.

**Key words:** Enrofloxacin, Oral administration, Hematology, Horse

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## References

- Allen, D.G.; Dowling, P.M. and Smith, D.A. (2005). Handbook of Vet Drugs. 3<sup>rd</sup> edition, Lippincott Williams & Wilkins Co., New York, USA. Pp: 447-450, 508-509.
- Bertone, A.L.; Tremaine, W.H.; Macoris, D.G.; Simmons, E.J.; Ewert, K.M.; Herr, L.G. and Weisbrode, S.E. (2000). Effect of long-term administration of an injectable enrofloxacin solution on physical and musculoskeletal variables in adult horses. *Journal of the American Veterinary*. 217 (10): 1514-1521.
- Boeckh, S.; Buchanan, C.; Boeckh, A.; Wilkie, S.; Davis, C.; Buchanan, T. and Boothe, D. (2001) Pharmacokinetics of the bovine formulation of enrofloxacin (Baytril 100) in horses. *Veterinary Therapeutics*, 2(2): 129-134.
- Cumming, B. (2009). Estimating a horse condition and weight. *Primefacts*. 928: 1-12.
- Davenport, C.L.M.; Raymond, M.S.; Boston, C. and Richardson, W. (2001). Effects of enrofloxacin and magnesium deficiency on matrix metabolism in equine articular cartilage. *American Journal Veterinary Research*. 62(2): 160-166.
- Ford, M.M.; Dubielzig, R.D.; Giuliano, E.A.; Moore, C.P. and Narfstrom, K.L. (2007). Ocular and systemic manifestations after administration of a high dose of enrofloxacin in cats. *American Journal Veterinary Research*. 68(2):190-202.
- Giguere, S.; Sweeney, R.W. and Belanger, M. (1996). Pharmacokinetics of enrofloxacin in adult horses and concentration of the drug in serum, body fluids, and endometrial tissues after repeated intragastrically administered doses. *American Journal Veterinary Research*. 57(7): 1025-1030.
- Giguère, S.; Sweeney, R.W.; Habecker, P.L.; Lucas, J. and Richardson, D.W. (1999). Tolerability of orally administered enrofloxacin in adult horses: a pilot study. *Journal of Veterinary Pharmacology and Therapeutics*, 22(5): 343-347.
- Giguère, S.; Prescott, J.F. and Dowling, P.M. (2013) *Antimicrobial therapy in veterinary medicine*. 5th edition. Wiley Blackwell, Oxford, UK. Pp: 199-231.
- Haines, G.R.; Brown, M.P.; Gronwall, R.R. and Merritt, K.A. (2000). Serum concentration and pharmacokinetics of enrofloxacin after intravenous and intragastric administration to mares. *Canadian Journal of Veterinary Research*, 64 (3): 171-177.
- Jackson, M.L. (2007). *Veterinary Clinical Pathology: an introduction*. 1<sup>st</sup> edition, Blackwell Publishing Ltd. Oxford, UK. Pp: 3-80.
- Langston, V.C; Sedrish, S. and Boothe, D.M. (1996). Disposition of single dose of oral enrofloxacin in horses. *Journal of Veterinary Pharmacology and Therapeutics*, 19(4): 316-319.
- Mueller, P.O. (2004). The effect of enrofloxacin on cell proliferation and proteoglycans in horse tendon cells. *Cell Biology and Toxicology*. 20 (1): 41-54.
- Papich, M.G. (2001). Current concepts in antimicrobial therapy for horses. *AAEP Proceedings* 47: 94-102.
- Sureshkumar, V.; Sarathchandra, G.; Ramesh, J.; Vairamuthu, S; Thejomoorthy, P. and Hariharan, P. (2012). Effect of administration of enrofloxacin on hematological profile on broiler chickens: A safety pharmacological study. *The Indian Journal of Field Veterinarians*. 8 (1): 20-24.
- Webb, J.A.; Allen D.G.; Abrams-Ogg, A.C. and Gentry, P.A. (2006). Effect of doxycycline, amoxicilin, cephalixin and enrofloxacin on hemostasis on healthy dogs. *American Journal of Veterinary research*. 67(4): 569-576.